

## Panel for Historical Engineering Works Newsletter

Number 164

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### To See Ourselves As Others See Us - A Diarist's Perceptions of Civil Engineering in the 1820s

By Barry Barton

Our eighteenth and nineteenth century forebears often kept detailed diaries, recording not only their personal lives but more general impressions of what they saw on their travels and the wider world around them. One such diarist was the Reverend Francis Edward Witts, rector of Upper Slaughter in Gloucestershire from 1808 until his death in 1854, a time when much construction activity was taking place throughout the country. Like many country parsons of that era, he had an active social and professional life (he was also a magistrate) and travelled regularly within Gloucestershire by stagecoach or private carriage. Witts could not avoid noticing these activities and was interested enough to record them in his diary, selected entries from which were published privately in 1978<sup>1</sup>. Some excerpts from Witts' diary are given in italics below, within which the occasional words in brackets are my explanatory additions.

August 26th, 1820

*"After luncheon we set off for Ross (on Wye), crossing the Severn by a very handsome new bridge of a single arch, in the construction of which great skill and science have been displayed. Having left the paved causeway we came on a delightful level road and passed on the right Highnam (Court), the seat of Sir B.W.Guise."*

My first thought was that this would have been Telford's Over Bridge, just west of Gloucester and now bypassed by the A40. The "delightful level road" which passed Highnam Court must surely be the present A40, but the date of the diary entry does not make sense – Telford's Over Bridge was not completed until 1828. So which 'new' bridge did Witts cross

in 1820? Between Maisemore and Gloucester the River Severn divides into two parallel channels, the East and West Channels. Until the 20th century, road traffic leaving Gloucester heading west had to cross both channels, first by Westgate Bridge, a single masonry arch built by Sir Robert Smirke in 1816 (demolished 1941). This must have been Witts' "very handsome new bridge". The next bridge, the old Over Bridge crossed by Witts and soon to be superseded by Telford's bridge, was described in 1826 as a "dilapidated and inconvenient structure".

January 11th 1823

*"Attended a meeting at Northleach convened to support a projected bridge over the Severn at Haw Passage between Gloucester and Tewkesbury, intended to shorten the communication between Hereford and London, through Cheltenham. Lord Sherborne presided and it was reported that nearly as much money was subscribed as was required: the estimate being £24,000 and £21,000 subscribed. A rival company of projectors also advocate a bridge at the Mythe near Tewkesbury, to cross the Severn above its junction with the Avon ..... and it is affirmed that the route to the metropolis through Stow (on the Wold) would be shorter and preferable. Ample funds are subscribed for their project and it seems that each party will carry their views into effect."*

The two proposed bridges mentioned here are James Walker's Haw Bridge on the B4213 near Tirley (1825, demolished by a river barge in 1958) and Telford's Mythe Bridge (HEW 0134) on the A438 just west of Tewkesbury.



Mythe Bridge

April 24th 1824

*"Leaving my wife at Cheltenham, I returned home to perform my duty (as the village parson). On my way to Upper Slaughter I explored the new line of road marked out to avoid Dowdeswell Hill which, diverging to the left at the foot of the hill, winds up the valley towards Whittington. Where it approaches Sandywell Park there will be a cutting of 30 ft. Running between Whittington and Sandywell Park it crosses the Stow road at Andersford and comes into the original road to Northleach a little above Frogmill*

*Inn. It will be a great relief to travelling and lead through a pleasing line of country."*

The old road left the valley of the River Chelt at an elevation of 405ft and climbed steeply up the valley side to Lower Dowdeswell for ¼ mile on a 1 in 7½ (13%) gradient. Even from the top of Dowdeswell Hill the route was still awkward for wheeled traffic, rising from 580ft at Lower Dowdeswell to a summit of 708ft near Upper Dowdeswell, ½ mile further on. The new, more easily graded route, now the A40, followed the course of the River Chelt up its valley to Andoversford, rejoining the old road a mile south of Andoversford, a total diversion of three miles - a significant engineering work.

May 6th 1824

*"At a meeting of the Commissioners of the Foss and Cross Turnpike roads, the Engineer of the Stratford and Moreton-in-Marsh railway communicated much information on the subject of rail roads, either in progress or in agitation. The Stratford railroad will be completed in December next. £146,000 have recently been subscribed to form a railway(sic) between Liverpool and Birmingham. From Moreton-in-Marsh a railroad is projected by the valley of the Evenlode through Wychwood Forest, by Cassington to Oxford. Another railway diverging at Oddington and proceeding to Idbury is meant to cross the country to Latton near Cricklade, there to join the North Wilts Canal and so extend a line to Bristol. These are sanguine schemes but, in the present redundance of capital, funds for the execution may be found, and they are more deserving of support than Columbian or Peruvian or Mexican loans, or than many other bubbles of this stock-jobbing age. Besides, the power of steam, and the new discoveries in science and mechanics, render easy and cheap schemes, which even a few years since would have been considered hopeless. The tram waggons may now be made to travel without horses by steam, and are so worked in both Yorkshire and Northumberland."*

The first of the projected railways described by Witts was eventually to be built as part of the Oxford, Worcester & Wolverhampton Railway's main line through Moreton, opened in 1853. Nothing came of Witts' second projected railway, from Moreton to the North Wiltshire Canal, opened in 1819, near Cricklade but did Witts assume that the railway and the canals with which it connected would constitute a hybrid transport link ("a line") between Moreton and Bristol via Swindon and Melksham? It seems that, even at this very early stage, Witts was fairly well informed about railway developments.

July 13th 1824

*"As we walked over the bridges at the confluence of the Severn and Avon we greatly admired the sweet meadow verdure and the diversity of cheerful objects presented to our view. Mythe Hill is much improved and the neat villas on its summit greatly ornament the bank. At its foot are the abutments of the projected bridge nearly in a state of completion and ready for the iron arch to be thrown over the Severn; beyond is the straight road, marked out, but as yet not made, which will lead to Ledbury."*

Witts mentions "*bridges at the confluence of the Severn and Avon*" and today the road west from Tewkesbury towards Ledbury, the modern A438, crosses two bridges in quick succession, King John's Bridge over the River Avon and, within ½ mile, Mythe Bridge over the Severn. King John's Bridge, which is actually two distinct bridges separated by a short flood-arched causeway, dates from c1190 but has been repaired and rebuilt numerous times since, notably in 1810, 1824 and 1962. But we know that Telford's Mythe Bridge (HEW 0134, completed 1826) was the first ever bridge across the Severn at Tewkesbury, so the "*bridges*" to which Witts refers must be the twin masonry arch bridges which together comprise "*King John's Bridge*".

The diary editor's footnote states that the projected bridge was "*By Thomas Telford. Cast iron with a single span of 170 ft.*" Mythe Hill rises from the east bank of the Severn. Witts and his companions were travelling in a carriage – was it the horses or the passengers who "*walked*" over the two existing bridges? One gets the impression that significant road improvements were commonplace in Gloucestershire the 1820s.

September 1st 1826

*"At the foot of Sharpness Point are the great works in progress for completing the Gloucester Berkeley Canal, a speculation which has been lingering for many years but seems at last proceeding towards the realization of the schemes of the projectors. The work was begun in 1794 and the object was to avoid the tortuous and dangerous navigation of the Severn to Gloucester, which indeed was only practicable at high tides. The project has at various times been quite at a stop. Of late years the energies of the subscribers have revived, and a great effort has been made and Mr Telford the engineer put in authority, to superintend the completion of the work. The canal has in great measure been excavated throughout the whole line, bridges erected, and the docks and basin near the quay at Gloucester in a great state of forwardness. The Proprietors are now building at Gloucester a range of Warehouses suitable to the expected trade.*

*Telford first came up, from Eskdale, as a mason to London about 1782 to work at the Adelphi, then building. His talent and scientific turn of mind, with the patronage of powerful and discerning men, among whom was Sir James Pulteney, who employed him largely on his estates and collieries, canals, etc. in Shropshire, have greatly advanced him to the very summit of his profession."*

Witts is clearly a fan of Thomas Telford, unsurprisingly perhaps, as Telford was engaged upon a number of projects along the Severn at that time. Witts' "*Gloucester Berkeley Canal*" is now known as the Gloucester & Sharpness Canal (HEW 0466). The Engineer was Robert Mylne although Thomas Telford was brought in as a consultant. Gloucester Docks (HEW 0625) predated the canal by about 15 years, originally with an entrance for river barges from the Severn.

September 5th 1826

*"The Stratford and Moreton railway was opened this day for the conveyance of goods from the former to the latter place, and a vast concourse of persons assembled at Moreton-in-Marsh. The market of this town, disused for a very long period, has on this occasion been revived with great spirit and will in some respects be injurious to the market at Stow-on-Wold. At an early hour in the evening al*

*the provisions of the town were exhausted, the roasted ox demolished and neither bread nor beer to be had for love or money. The committee preceded the coal waggons with a band of music, and all was joyous. Behind the scenes, however, the proprietors have reason to mourn over mismanagement, exhausted means and scant hopes even of distant remuneration; but the public will no doubt be considerable gainers."*

This last comment by Witts was to prove remarkably prescient, a situation which was to become all too familiar to promoters of rural branch lines over the next half century. It is not clear from Witt's diary whether he himself invested in canals or railways. The Stratford & Moreton railway was a 16-mile horse-hauled but standard gauge tramway engineered by John Rastrick, with a branch (1836) to Shipston-on-Stour. The Moreton to Shipston section was absorbed into the national railway network in 1859; the northern section of the tramway managed to stagger on until the start of the 20th century.

April 2nd 1827

*"We walked to Over Bridge (from Gloucester, presumably) to view the site of the new bridge over the Severn, building under the direction of Mr Telford, by the County. The work is in progress; many labourers, excavators etc. were employed. On one side the masonry of an abutment is in a forward state, on the other they are driving the piles. There were collected great heaps of fine stone ready squared in large blocks, of different sorts, for the foundation and superstructure. A steam engine was erecting, and several cranes were in operation, lifting masses of stone from the barges in which they were conveyed."*

At that time Westgate Bridge was a toll bridge which Telford's workforce coming from Gloucester to Over Bridge had to cross twice a day, a cause of some grievance. It was claimed locally that the tolls collected had already exceeded the capital cost of the 1816 bridge and when Telford's workmen rioted in protest they were actively supported by the local residents.

April 26th 1827

*"This day was a great holiday in Gloucester. The Berkeley Canal, now fully completed, being opened. Two large vessels, with a considerable number of smaller ones, arrived in the afternoon in the canal basin, amid the greetings of many thousand spectators, having performed successfully the voyage from the basin at Sharpness Point. One of these ships was a three-master, a large square-rigged vessel, the other a brig. In the evening I saw them moored in the spacious basin, bedecked with flags and streamers, and surrounded by a gaping crowd; tents and booths with liquor and refreshments lined the margin of the basin. The Canal Company has erected a very large range of warehouses contiguous, and provided that no impediment interferes from shifting sands in the Severn at the mouth of the canal, the great work now accomplished will be of infinite service to the city and this part of the country."*

The diary editor comments that *"Francis Witts was quite right. The opening of the canal made a vast difference to the economic importance of the city"* by enabling sea-going ships to reach Gloucester.

July 15th 1828

*"Walked to view the new Over Bridge. The arch is now completed and the centres removed. It is indeed the most beautiful structure; the span of the arch exceeds any other in the Kingdom, and it is peculiar in being made up of two dissimilar curves worked into one. Mr Telford observes that it will stand comparison with any similar structure in Europe."*



Over Bridge

In a footnote the editor stated that *"The design was based on Jean-Rodolphe Perronet's five-arch bridge over the Seine at Neuilly built in 1768 and its most remarkable feature is the chamfered arch. The proposed demolition of the bridge when the new bridge was opened in 1974 was defeated by the national and local conservation societies and it has been scheduled as an Ancient Monument, and preserved."*

April 28th 1829

*"I walked to Over Bridge which is nearly completed. It is very beautiful, light, graceful and imposing by its span; it requires some time and consideration to convince the mind of its real dimensions. I am persuaded it will remain for centuries a testimony of the profound science of Mr Telford. Total expense £43,269."*

It is incomprehensible that, even in 1974, anyone in a position of authority should have been so crass and insensitive as to propose the demolition of Telford's Over Bridge.

April 20th 1830

*"A rumour was whispered that the new bridge at Over had given way and was in danger of falling. Mr Telford was called upon to report on the security of the structure."*

*Howell and I walked to the Gloucester & Berkeley Canal basin, now crowded with vessels, many of them of large size, and presenting a busy scene. Capacious warehouses are already finished and occupied on one side and a large range is in progress of erection in another quarter. It is astonishing how much of the trade of the port and canal have increased, beyond the most sanguine expectations. The exports of salt for foreign ports and the fisheries are on a very large scale; the iron manufactures are largely exported through this channel and a great quantity of corn, chiefly from Ireland, is imported. A considerable trade in timber, principally from our*

*North American colonies, is carried on; even Liverpool receives from hence, by canal, large quantities of timber. Slates are a principal article brought from Wales for use in the inland ports. Two houses in the wine trade make large importations from Spain and Portugal; to these may be added wool, barilla etc."*

When the centring supporting the arch at Over Bridge was removed the soffit immediately sank by 2" with a further 8" settlement occurring over the next few weeks as the abutment wing walls moved. Telford had trimmed the cost by not piling under the wing walls and bitterly regretted this omission. Although the settlement stabilised and the bridge did not collapse as feared at the time, Telford considered the work to be one of his few failures.

Presumably Witts' "*North American colonies*" are by now just Canada. Barilla is an impure alkaline soda ash (Sodium Carbonate) obtained from burning certain salt-tolerant plants.

March 16th 1852

*"Before dinner ..... visited the docks and shipping, also the great work for widening the canal near Llanthony, being much interested in the labours now in progress as to excavation, noticing the boldness and the ingenuity of the workmen, their steadiness and energy, and the judicious application of the machinery and tools employed. Ancient sewers belonging to Llanthony Abbey, old stone coffins, and pillars and fragments of masonry are frequently laid bare."*

This Llanthony Abbey, despite its name, stood on the southern side of Gloucester, and is not to be confused with the much better known Llanthony Abbey in Wales (Monmouthshire) and which is nowhere near any docks or canal.

Such confusions lay in wait for the unwary researcher. A diary entry for March 1852 refers to Swindon as "*with its manor house, its ancient church restored, its parsonage, and two or three lesser residences ..... in one of which the Chief Constable resides, is a pretty, rural, quiet hamlet embosomed in trees*". Surely not, in 1856? A few lines further on a mention of the village being "*bordered at a distance by the Bristol & Birmingham Railway and commanding beautiful views of the surrounding hills*" sets alarm bells ringing. The Swindon visited by Witts is in fact a village on the northern outskirts of Cheltenham, not Brunel's railway town some 30 miles to the south east.

1. Diary of a Cotswold Parson. Reverend F.E.Witts 1783-1854. Ed. David Verey, Pub. Alan Sutton, Dursley 1978.

## ICE Scotland Museum

### By David McGuigan

The ICE Scotland Museum is located in Heriot-Watt University's Edinburgh Campus. Founded in 1971, next year it will be celebrating its 50th birthday. The museum is home to over 500 items relating to civil engineering of which most are on display.



View of the museum showing a hydraulic riveting machine used during construction of the Forth Bridge in the left foreground, on loan from the National Railway Museum.

Over the past year the museum's website has been moved to a new platform and it includes a full catalogue covering all items held in the collection with images and descriptions (<https://ice-museum-scotland.hw.ac.uk>). Some of Professor Roland Paxton's public lectures are also available to view.

In recent years the museum has taken part in the Edinburgh Doors Open Day event, which unfortunately has been cancelled this year. The organisers have requested participants in the event to prepare virtual tours of their venues for inclusion in an online brochure to be widely distributed. The museum has prepared a virtual tour and this has been uploaded to the website at <https://ice-museum-scotland.hw.ac.uk/virtual-tour/>.

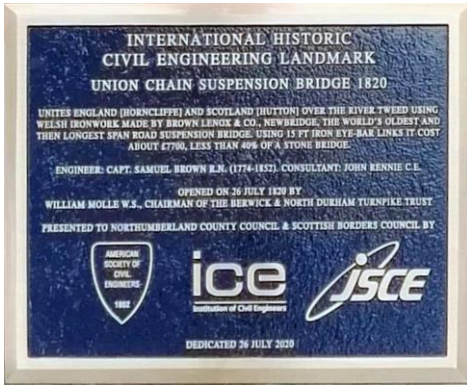
Information about visiting the museum is available on the website. The curation team are always happy to organise guided tours of the museum at times convenient to all. A printed guide to the museum is available on-site and a downloadable version can be viewed on the website.

## The Friends of the Union Chain Bridge Bicentenary Commemoration, July 26th 2020

### By Stephen K Jones

Because of the Covid-19 restrictions, which had required the cancellation of all live events organised by The Friends and their Project Partners, an informal arrangement was made to enable Friends, members of the local communities and visitors to pay their respects to Capt Sir Samuel Brown and the Union Bridge on its Bicentenary, Sunday 26th July.

When the Friends set up their booth on the site of the old toll cottage in midmorning, people – locals and visitors – were already beginning to visit the Bridge and to cross from England to Scotland and vice versa. There was a happy and relaxed informality.



At 12 noon exactly, the Friends' Chairman, Robert Hunter, made a short speech welcoming those present, referring to the abandoned programme of events and, in particular, to the IHCEL plaque (above), which was on display. He recited the last verse of the poem composed by the Chairman of the Berwick and North Durham Turnpike Trust, William Molle, which he noted was of particular relevance on this very special occasion:

*"Success to the Tweed, with her rich salmon treasure;  
Success to the people who live on her side;  
Success to the man who concerted the measure  
Of throwing a chain bridge over her tide"*

and concluded by proposing a toast to the Union Bridge and its engineer, Samuel Brown, and to absent friends, in which all present participated to general applause.



Robert Hunter proposing a toast

A Friend who had cycled from Alnwick played appropriate tunes ex tempore on her clarinet and as a tape of Union flags was lowered a group of cyclists crossed the Bridge in place of Sam Brown's loaded carts. A party of supporters of the Union, who had travelled from Glasgow, displayed the flags of the United Kingdom in the centre of the Bridge in a dignified recognition of the Bridge's motto *Vis Unita Fortior* (Force is Stronger).

There was a steady flow of visitors to the booth and the Bridge throughout the afternoon – some had travelled especially to Berwick for the weekend to pay their respects to the Bridge and several copies of *Spanning the Centuries* were sold, with other souvenirs of the occasion. The plaque was much inspected and greatly admired.

The informal event concluded at about 4pm. The papers that were going to be part of the conference today have been published. The retail price of the book from the Friends is £7.50, plus £2 package and posting, £4 overseas. The book can be ordered from The Friends of Union Chain Bridge, Chain Bridge House, Horncliffe, Berwick-upon-Tweed TD15 2XT.

<http://www.unionbridgefriends.com/publications/>



Union Chain Bridge

## Chairman's column By Gordon Masterton

As I mentioned in the previous Newsletter, our planned conference on "Engineering Foresight from Hindsight" on 24 July was a victim of Covid-19. I'm particularly disappointed that this meant we missed the opportunity to meet old friends from ASCE who were planning to come to Scotland that weekend and participate in the unveiling of the Landmark Heritage Plaque for the Union Chain Bridge. I really value the strong links we have with the ASCE History and Heritage Group. We have so much in common in our ethos and our approach.

Instead we used the day for a Zoom call of PHEW Representatives, Archives Panel chair and our new lead for Education and Outreach, Sue Threder. We also had contributions from guests invited to share their experiences and activities within the broad sector of Engineering Foresight from Hindsight. For example, Brian McKenna demonstrated the excellent work he had done to illustrate hard copy Heritage Trails online, beginning with Glasgow's Clyde Bridges. This was especially pleasing to me, having been the original author for the first printing of that broadsheet in 1990, as part of the celebrations for Glasgow's year as European City of Culture. The construction of more bridges over the River Clyde since then have led to two revisions, but much of the original material remains. I remember giving a talk on Glasgow's Clyde Bridges that year in the iconic and highly appropriate venue of "The Arches" supporting the link between Glasgow Central Station and the Caledonian Railway Bridge.

The meeting endorsed the establishment of a "Hindsight to Foresight" Steering group to bring together the three overlapping areas of:

- Collecting Material (led by PHEW)
- Curating Data (led by Archives Panel)
- Publicising and Disseminating Material (led by chair of Education and Outreach)

The meeting reviewed progress on the four active projects, and despite the constraints on travel, it was encouraging to see progress on improving the quality of the HEW Database. Carol Morgan had appealed to PHEW representatives to provide photographic images to fill the gaps in the online database and this had resulted in over 600 new Images being added by Carol to the records. <https://www.ice.org.uk/knowledge-and-resources/historical-engineering-works>

The suggestions that had been made by Roger Davies were warmly welcomed and Roger is now engaged with the ICE's IT support team with high hopes of some significant improvements to the quality of the data and the means of accessing.

The exercise has shown that there is much still to be done, and that even if lockdown extends or is reinstated, there is no shortage of activity required. Roger has done an excellent job in recommending specific and achievable improvements and if we emerge from Covid-19 with a significantly enhanced and improved HEW database, at least our enforced reduced mobility will have had a side benefit. Not that we would have chosen a pandemic to spur us into that particular action.

Ian Weir and Richard Adam have agreed to work together on indexing and cataloguing our PHEW Newsletters, a valuable source of information over many years that needs to be unlocked.

The idea of a future exhibition, either virtual or travelling from a London base, to coincide with the bicentenary of the death on 4 October 1821 of John Rennie, Senior has most promise. 2021 will also be the centenary of Southwark Bridge over the Thames which replaced Rennie's iron bridge on the same site.

I do look forward to this steering group, augmented as necessary from the wider community, it will give additional impetus to demonstrating the relevance and value of understanding the past before designing the future.

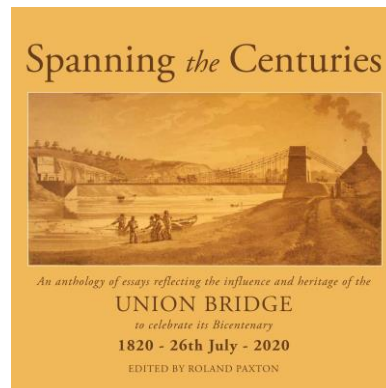
As Master of the Worshipful Company of Engineers this year, I have teamed up with five other livery companies with an interest in engineering to launch a City of London Engineering Hall of Fame, with the objective of explaining and promoting the significance of the contribution of engineering to the success and sustainability of the City of London, past and present. The founding members are the Worshipful Companies of Engineers, Ironmongers, Armourers and Brasiers, Shipwrights, Scientific Instrument Makers and Water Conservators. Between us we cover the breadth and depth of

engineering rather well. All suggestions for suitable inductees will be welcomed by the judging panel.

Yet another Covid-19 casualty is the 2020 James Watt Dinner in Glasgow, at which new inductees to the Scottish Engineering Hall of Fame are traditionally announced. We have decided to make announcements of three 2020 inductees without the benefit of the dinner as our platform, so watch out on social media and other channels for that announcement soon!

## Book Reviews

**Spanning the Centuries: An anthology of essays reflecting the influence and heritage of the Union Bridge to celebrate its Bicentenary 1820-2020. Edited by Roland Paxton. Berwick: Friends of the Union Chain Bridge, 2020.**  
**Gordon Miller, Samuel Brown and Union Chain Bridge. Berwick: Friends of the Union Chain Bridge, 2017.**  
[www.unionbridgefriends.com](http://www.unionbridgefriends.com)



Among the many events of interest to engineers and engineering historians that fell victim to the COVID-19 lockdown was an intended international symposium at Horncliffe Memorial Hall to celebrate the bicentenary of the opening of Samuel Brown's Union suspension Bridge over the Tweed, the first traffic bearing suspension bridge in Europe, and the longest span in the world at the time. It is a remarkable survival, the longest serving example of a chain supported level deck suspension bridge in the world. In recognition of the achievement it was due to be inscribed as an international civil engineering landmark by the American Society of Civil Engineers, with the support of the Institution of Civil Engineers, and Japan Society of Civil Engineers. The symposium programme was arranged by Professor Roland Paxton under the auspices of the Friends of the Union Chain Bridge, who have attracted Heritage Lottery funding to enable a full restoration programme to begin, under the Union Chain Bridge Project Board.

Although the symposium could not take place, Roland Paxton was able to ensure the intended papers were published, and thanks to the efforts of local printers Printspot, with illustrations to a very high standard, particularly valuable with the outputs of the radar site investigation by Atomic Dietric Response (ADROK). The essays provide useful background on the bridge, its historic significance, its future including recent investigative work, together with essays

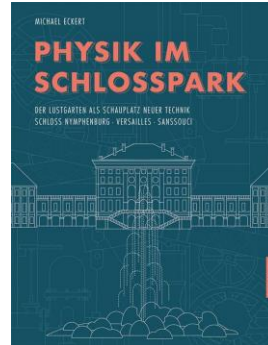
on some well-known record beating international suspension spans.

Roland Paxton discusses the bridge's significance, paying tribute to both Samuel Brown and John Rennie, who provided engineering advice, and also explaining the recent work by Heriot-Watt and Adrok that used radar to investigate the location of the original chain anchorages to aid current restoration work. Colin Stove provides details on the radar investigation, Steve Jones gives details of Brown's chain manufactories, focussing on the Pontypridd works that continued in use until 1998. Simon Rudman gives details of the planned restoration works, while Miles Oglethorpe of Historic Environment Scotland, Rowan Brown and Matt Storey (Museums Northumberland) talk more about the educational and heritage opportunities provided by the restoration of the bridge and promoting it as a heritage site of international importance. Local resident Heather Thompson gives a personal and local perspective on growing up alongside the bridge, and how the local community can benefit from understanding the bridge and its story. While the papers by Raymond Paul Giroux (Brooklyn), and Hiroshi Isohata (Akashi Straits) describe well-known suspension bridges, Hans Seland, a retired civil engineer from the Norwegian Public Roads Board, describes the influence of Samuel Brown's bridges on the Bakke bridge, Norway's first (and surviving) suspension bridge. Brown's Kalemouth Bridge, rather than the Union Bridge, seems to have been the more direct model for the Bakke design, but there is plenty in this volume to make clear the primary significance of the Union Bridge.

The volume makes clear the importance of archives in telling the story of suspension bridges and informing restoration, but also the need for site investigation to make clear uncertainties regarding the current state of older structures. There are many contemporary drawings and illustrations reproduced here, covering two centuries of bridge design, as well as valuable insight into episodes like the impact of an earthquake on the construction of the Akashi crossing. However, unfortunately, there are no bibliographic references. The essays provide a useful starting point for anybody interested in the history of suspension bridges, and community engagement with heritage engineering, but the reader will have to look elsewhere to follow up on the detail.

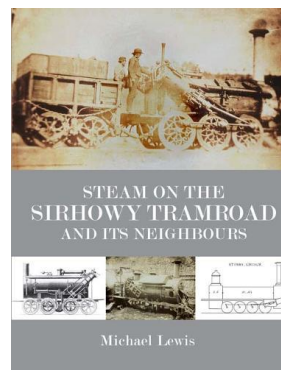
For the Union Bridge story, and relevant earlier sources, one can turn to Gordon Miller's history of the Union Bridge, which includes a chapter by Stephen Jones on the Brown Lenox ironworks referred to above. Miller gives a meticulous account of the Union Bridge story down to 1974, and restoration work to that date. Unfortunately it contains no references to work done on Brown subsequently by Thomas Day and Emory Kemp, or indeed by Roland Paxton. It is an essential monograph on the Union Bridge, but not the last word on Brown more generally.

#### Michael Eckert, Physik im Schlosspark, Munich: Buch & Media, 2020.




Eckert looks at a little explored aspect of early engineering—the technology of water supply in palace gardens, notably Versailles, Nymphenburg (Munich), and Sanssouci (Potsdam). This is a story of better understanding of hydraulics, the transition from water powered pumping machinery to steam power, and the strength of materials, heavily illustrated from a variety of printed texts, topographic views, and some modern photographs. The bibliography is thorough, including reference to Andreas Kahlow's 2017 monograph on the pumping works at Sanssouci (Das Pumpwerk fuel die Fontaenen von Sanssouci, Berlin: BundesIngenieursKammer). It is evident these developments in water features were international in their scope, as ruling dynasties across Europe vied to have the most spectacular gardens. While the engineering work of Capability Brown has attracted some interest, Eckert's work suggests it would be a rewarding research subject for engineering historians.

#### Steam on the Sirhowy Tramroad and its Neighbours by Michael Lewis <https://rchs.org.uk/product/steam-on-the-sirhowy-tramroad-and-its-neighbours-published-7-september-2020/>



Just published is the story of the 4ft 4in gauge Sirhowy Tramroad in south Wales, which when opened was the longest railway anywhere in the world. Carrying iron and coal from Tredegar to Newport between 1804 and 1860, it was soon joined by several other lines to form the largest connected system of plateways that ever existed with an astonishing number of some eighty locomotives – at the time the largest group of locomotives in the UK. The engineering infrastructure was also in the forefront; the Long Bridge, Risca, was the longest railway viaduct in existence.



Built in 1805 it was demolished in 1902. George Overton's four arch masonry Rumney Railway viaduct over the Ebbw river at Bassaleg built in 1826, however, can claim to be the oldest railway viaduct in the world still to carry traffic. This book is an important study of early locomotives at the birth of the modern railway.

## Hews in the News

Transport Scotland have applied for Kingston Bridge, Glasgow to be listed by Historic Environment Scotland during its 50<sup>th</sup> anniversary year. The bridge, which forms part of the M8 motorway, was opened 26 June 1970. It is thought to be one of the busiest stretches of motorway in Europe carrying about 155,000 vehicles through the centre of Glasgow daily.

Unfortunately, a planned exhibition by the Glasgow Motorway Archive has had to be cancelled due to the Covid 19 virus. However, the anniversary was covered by The Scotsman, The Herald and The Daily Record 26 June and The Sunday post 21 June.

Queensbury Tunnel Society expressed disappointment with the Government's response to Bradford Council's year-long efforts to develop a strong case for a Bradford-Halifax Greenway (B2HG) via Queensbury Tunnel.

A study concluded that the route would return £5.60 in social and economic benefits for every £1 invested representing very high value for money. Leisure and tourism would drive this figure up further.

The Government have offered the council £4 million to take over ownership of the tunnel but this is just 60% of the cost of repairs and would not fund building the Greenway. The Society has set up a petition and details of how to object. <https://www.change.org/p/securing-a-beneficial-future-for-queensbury-tunnel/u/27167104?>

Works have started on the repair of the Cambus O' May suspension bridge. The 1905 Edwardian bridge over the River Dee was rebuilt in 1988 and was severely damaged by the floods during Storm Frank at the end of 2015. <https://online.aberdeenshire.gov.uk/apps/news/release.aspx?newsID=6902> Sept 2020

The White Bridge, also known as Berw Bridge, Pontypridd <https://www.walesonline.co.uk/news/local-news/bridges-need-demolished-replaced-after-17873772>

Walesonline reported on 6 March 2020 that bridges will need to be demolished and replaced after damage done during Storm Dennis and that Castle Inn Footbridge in Treforest and White Bridge (Berw Road Bridge) in Pontypridd are set to be knocked down and replaced

because they are at risk of collapse, Councillor Andrew Morgan, the leader of the council, told councillors on Wednesday, March 4.'

Berw road bridge is a very early example of Mouchel's work, largest of its type when built [1909] and assessed Grade II\*, however the extent of the damage raised by the initial survey at the time of Storm Dennis has been challenged and information this month is that it will be clarified in a new report requested by CADW to be commissioned by Rhondda Cynon Taff County Borough Council and undertaken by Mann Williams.

Brunel's original Bristol Station has been sold by Bristol City Council to Network Rail. The Grade I listed building opened in 1840 but growing passenger numbers resulted in work on the adjoining Temple Meads station beginning in 1871.

Network Rail plans to restore the buildings whilst continuing their commercial use.

<https://www.bristolpost.co.uk/news/bristol-news/iconic-first-train-station-bristol-4517919?>

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

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