

## Panel for Historical Engineering Works Newsletter

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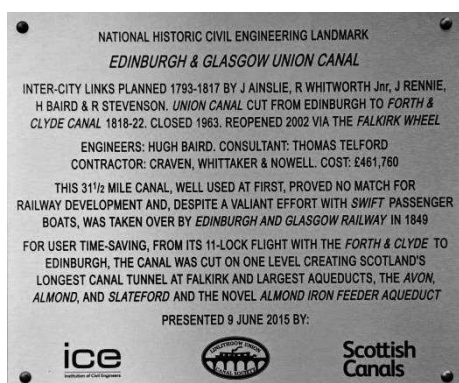
Editor's Notes

donation to the Society's Museum of a 1st edition of Telford's first report (1815) supporting the canal as its consulting engineer. The event closed with an enjoyable boat trip under the expert guidance of former LUCS chairman Mike Smith.



Professor Roland Paxton, Paul Jowitt and Provost Tom Kerr  
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## Historic Landmark Award for Edinburgh & Glasgow Union Canal By Roland Paxton



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On 9 June this canal was awarded **National Historic Civil Engineering Landmark** (NHCEL) status, by the Institution, at a well-attended plaque unveiling ceremony at Linlithgow Canal Basin. It was an ICE Scotland PHEW initiative to exemplify and promote to the public our profession's contribution to society, with valuable support from *Linlithgow Union Canal Society* (LUCS) and *Scottish Canals*.

As co-host I introduced Tom Kerr, Provost of West Lothian and canal long-boat owner Professor Paul Jowitt CBE PPICE who performed the ceremony with style. Following refreshments, LUCS Chairman Duncan McIntyre, thanked everyone for coming and for my

The earliest plaques organised by PHEW, with ASCE for internationally significant works such as the Tay (1987) and Forth (1990) Bridges, were briefly worded and of little information value. This shortcoming was addressed in later plaques particularly those for the Forth & Clyde Canal, Menai and Conwy Bridges, Caledonian Canal, Melville Column, Titan Crane, early Scottish railways, Bell Rock Lighthouse and Union Canal, by mentioning the engineer, contractor, context and significance.

This plaque, duplicates of which are planned for other visitor locations, inform that the canal costing £481,760 was made from 1818–1822 to unite Edinburgh with the Forth & Clyde Canal near Falkirk at a terminal 11-lock flight. The locks were closed in 1933, the canal in 1963, and the whole reopened in 2002 by means of the *Falkirk Wheel* boat lift. The canal's engineers were Hugh Baird and Telford and the contractors Craven, Whittaker and Nowell [Lindsay, J. *The Canals of Scotland* 1968, 66–85].

The 31½ mile canal, well used at first, proved no match for railway competition and despite a valiant effort with *SWIFT* passenger boats was taken over by *Edinburgh & Glasgow Railway* in 1849. For user time-saving, from its lock flight to Edinburgh, the canal was cut on one level 242ft above sea level resulting in Scotland's longest canal tunnel at Falkirk and largest aqueducts, the Avon, Almond and Slateford and the novel Almond iron feeder aqueduct [Paxton & Shipway *CEH Scotland* 2007, 173-].

This event, attracted coverage in the *Inland Waterways Association Bulletin* (mid-June) and the *Linlithgow Journal & Gazette* (12 June 2015), which concluded, "Duncan McIntyre for the Linlithgow Union Canal Society is delighted by the Institution's national recognition for the

Cockerton and to Carol Morgan for preparing such a fascinating itinerary around the theme of the challenges facing the integration of heritage assets into a modern context. It was particularly pleasing to be based in the ICE library for our formal events. It was, too, a momentous occasion being the final PHEW meeting to be attended by our 'éminence grise', Roland Paxton. We will all miss Roland's regular attendance but as our first newly created class of 'Member Emeritus' I believe we will still have a degree of access to his knowledge and experience. We certainly have his goodwill.

The theme of how best to deal with heritage assets reminded me of my recent article in *Infrastructure Intelligence* and I therefore would like to share it. The title I used is a phrase used by Emma Shaw our Events Manager in the first meeting of a new ICE group bringing together PHEW, Archives Panel, communication, press and engineering policy:

### Turning Hindsight into Insight

I often hear the message that it's time the civil engineering industry broke free from the shackles of its history.

"The country still runs on Victorian infrastructure and we place too much reliance on our past glories and Victorian engineer-heroes like Brunel" (a somewhat overrated icon who has obscured better engineers with his shadow – a personal view!)

"The Victorians might recognise many elements of our infrastructure. The rest would look like science fiction."

The Victorians did indeed build a lot of infrastructure – and they inherited a network of canals and emerging roads. But their railways were not electrified. Their water supply and sewerage systems were not computer controlled.

Their streets were lit by gas. Their machines were fuelled by coal. They had no networked electricity generation. And powered flight was a pipe dream. The Victorians might recognise many elements of our infrastructure. The rest would look like science fiction.

Just as we continuously adapt and evolve our infrastructure until it's fit for today's standards, so did our 20th century predecessors: railway electrification, telemetry, automatic lighthouses, motorways, hydroelectricity, nuclear power, space exploration.

They're all 20th century developments. It was a highly productive century of engineering. We did not just sit on our Victorian laurels. Engineering is a continuum.

But the point is that to evolve and adapt effectively, we need to understand what we already have, why it was done that way, what materials were used, what cultural ties are bound into it. We need to understand the past so that we can better design the future.

My pitch applies to many areas of **#mydayengineering** (yes, there's a hashtag). Not least to safety. The fundamental aim of the Structural-Safety body is to learn from the past. The excellent database in CROSS is essential reading before embarking on any new structural

design. But the principle applies to all aspects of appropriate and sympathetic design.

Every engineer should have a grounding in Heritage 101 and the starting point in every new project should be a comprehensive assessment and understanding of past decisions and choices.

It's not a dry and dusty topic. It's an essential launchpad. It's about turning hindsight into insight.

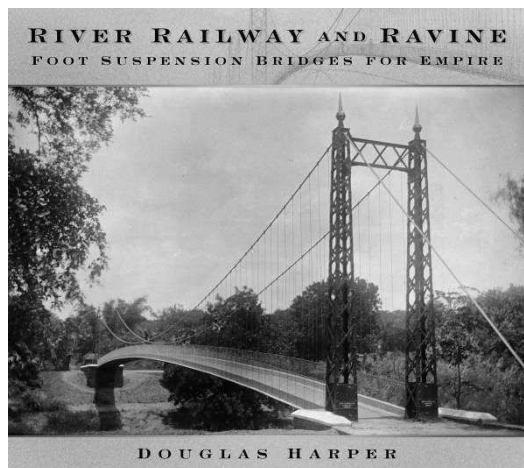
[An article that first appeared in <http://www.infrastructure-intelligence.com/article/aug-2015/turning-hindsight-insight>]

Finally, Peter Cross-Rudkin and I were pleased to be invited to contribute to the BBC's latest engineering heritage series on *Canals* which was broadcast on 1 September 2015. <https://myshare.box.com/s/dxjnje248k58ydk0qsk1u3dxw2i02mrm>. The producer Paul Craven says "BBC Four were very happy – the documentary had the highest audience of all their programmes since November last year." The public has an appetite for engineering history!

My interview was filmed in the ICE Library. It looked magnificent!

## Book Notice


### Review by Roland Paxton



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***River, Railway and Ravine: Foot Suspension Bridges for Empire* by Douglas Harper. The History Press, The Mill, Brimscombe Port, Stroud, Gloucestershire, GL5 2QG. [www.thehistorypress.co.uk](http://www.thehistorypress.co.uk). ISBN 9780750962131. August 2015, £20 (hardback)**

Building bridges is one of man's most worthwhile pursuits, in the story of which the ingenious suspension footbridges of Messrs Harper of Aberdeen from 1870–1910 deserve a place. From small beginnings making wire fencing this remarkable firm took out a patent for cable tensioning and applied steel wire ropes to design and pioneer an economical prefabricated bespoke bridge with spans of up to 300ft [91m].



Well engineered and managed the 'Harper Suspension Bridge' enjoyed success at home and abroad, the firm being a Contractor to the India Office and Colonial and Foreign Governments. At least 61 bridges were erected, probably many more, of which some 20% still in service include Birkhall (1880) in the Dee valley and Sellack (1895) near Ross-on-Wye. Learning that about a dozen bridges had been erected across Nepal proved an irresistible temptation for the author to visit and investigate.

The book, a case study of Scottish enterprise set in an informed bridge development context, sheds new light on the firm's achievement. It has 120+ illustrations leavened with useful description and comment and benefits from the enthusiasm and diligence of its former surgeon author, Douglas Harper, a direct descendant of the entrepreneurs – a delightful read!

## HEWs in the News by Brian George

The Ty-Coch Restoration Project aims to restore a derelict section including eight locks, of the Mon & Brec Canal in Cwmbran. It is supported by a £854,500 Heritage Lottery Fund grant awarded to Torfaen County Borough Council in partnership with Monmouthshire, Brecon and Abergavenny Canals Trust. IWA *Sou'Wester* (April) tells us that over the last year there have been many developments including a new workshop. Progress has been made on five of the eight locks due for renovation. A start has been made on the slipway at Brake Lock. All work, except for the gates, which are now being completed at the new workshop, has been completed at Shop Lock.

The IWA West Country Branch has launched a campaign to improve the use of the proposed Tidal Surge Barrier on the River Parrett at Bridgwater, following the extensive flooding of the Somerset Levels. The branch is urging that a lock should be placed in the barrier to facilitate entry from the sea to the river to reach the Bridgwater Dock area.

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The *Daily Telegraph* (7 May, page B3), shows a large photograph of Llandudno Pier (HEW 432) telling us that it has been sold for £4.5m by Bilfinger GVA Retail, Hotels and Leisure, on behalf of Crown Entertainment Centres. New owner Adam Williams, of Tir Prince Raceway, has vowed to invest to ensure the "Queen of Welsh Piers" has a future.

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The Brunel Swivel Bridge in the Cumberland Basin at Bristol is Grade II\* listed and on the English Heritage register of 'Buildings at Risk'. It is important because it is the first large rotating wrought iron opening bridge. Designed in 1849 in Brunel's Westminster office it became operational the same year. An appeal for funds to carry out repairs has been launched by the Avon Industrial Buildings Trust at Thornbury BS35 1LD.

The *Bristol Post* (25 February) showed a photograph of the Clifton Suspension Bridge (HEW 129) because the

towers are to be cloaked in scaffolding to assist repairs to the stonework. The Clifton tower will be tackled first, for completion in October, the Leigh Wood tower to be tackled in 2016.

The *Bristol Post* (4 February) noted that thousands of people in Wolverhampton paid tribute to Sir Jack Hayward, at his funeral on 3 February. Sir Jack, who died on 13 January aged 91, donated £150,000 in 1970 to bring back Brunel's SS Great Britain (HEW 247) from the Falkland Islands, 8,000 miles away, to Bristol where it had been built in 1843. Wolverhampton was the town where he had been the owner of the town's football club and where his father had been born.

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*Rail* (29 April–12 May) notes that at Brighton Volks Electric Railway (HEW 500) is gearing up to construct a new aqueduct station and new sheds at Banjo Groyne. Much of the new work will be financed by the Heritage Lottery Fund. At Gateshead, Dunston Staithes (HEW 2003) on the riverside, considered to be the largest timber structure in Europe, has been opened to the public following completion of the restoration.

The biggest British-built tunnel boring machine is to re-bore one of the Farnworth tunnels, the one built in 1838 and listed Grade II, while the 1881 single track tunnel is having approach tracks and signalling modified to allow trains to pass in each direction. The widening of the earlier 270-metre long tunnel on the Manchester-Bolton-Preston line to a modern two-track tunnel is to allow for electrification. Then at the end of the project, the line through the 1881 tunnel will be closed and lifted and will allow access for railway workers. Key to the project's success is a new machine being specially designed and built for Network Rail by Tunnelling Engineering Services of Oldham. It will be 29ft 6in diameter and is believed to be the largest ever built for use on the UK's railways.

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The Inland Waterways Association *Bulletin* for Mid-April showed a photograph of Himalayan Balsam covering the Staffordshire and Worcestershire Canal (HEW 1083). The Association began an Awareness Week from 16 to 24 May when the public was asked to help root out the invasive plant.

A photograph of Pulteney Weir in Bath accompanied a note that the river Avon in Bath had been dredged to reduce the flood risk to 238 properties in the city centre. The Environment Agency had focused the dredging on the stretch between Windsor and Victoria bridges (in the old gas works area) after the EA carried out a survey of flood defences. This length of the river Avon is part of the Kennet and Avon route from Bristol to the river Thames at Reading. Waterways noted that motorcycles and 120 trolleys were recovered.

The Environmental Agency has awarded ECS Engineering Services a project to design build and install a new bridge to replace the current structure at Mapledurham Weir on the river Thames near Reading. The proposed design from ECS will use proprietary technology to construct a strong,