

CONTENTS

Historic Bridge and Infrastructure Awards – 2002
The Torksey Viaduct – 1849–2002
King's Cross Anniversary
'First Impressions' – A View of the Panel's Visit to Exeter
The Chairman's Column
Brindley Gates – Further Correspondence
Brunel Engine House
The Motorway Archive Trust and its Publications
The NAHSTE Project
Book Review – 'Bridges in Hampshire of Historic Interest'
HEWs in the News
Editor's Note

HISTORIC BRIDGE AND INFRASTRUCTURE AWARDS – 2002

by David Greenfield

Seventeen projects were nominated for the 5th annual Awards. The scheme was extended this year to include repair, strengthening and conservation projects completed during the previous two years, and which involved any transport-related structure over 30-years-old, in England and Wales.

Professor Roland Paxton again chaired the panel of judges, who were:

- Terry Girdler, Chief Structural Engineer of English Heritage,
- Mike Winney, Editor Emeritus of NCE
- Andrew Leadbeater, ex-Chairman of the County Surveyors' Society Bridges Group.

The judges were gratified to see so much variety among the nominations, and were impressed by the excellence displayed in the design and execution of many projects. They decided to give Awards to three outstanding projects and Commendations to a further six.

The three projects which received **Awards** are:

- **Anderton Boat Lift restoration**, Cheshire
- **Standedge Tunnel restoration**, North Yorkshire
- **Tamar Bridge strengthening and widening**, Plymouth/Cornwall

The six **Commendations** went to:

- **A6 Cavendish Bridge refurbishment**, South Derbyshire
- **Breamore Great Bridge restoration**, Hampshire
- **Buttington Bridge refurbishment**, Welshpool
- **Caerwrlle Packhorse Bridge rebuilding**, Flintshire
- **Kingston Bridge widening and strengthening**, Kingston-upon-Thames
- **V2 Vivian Incline restoration**, Llanberis

Each project is briefly described below.



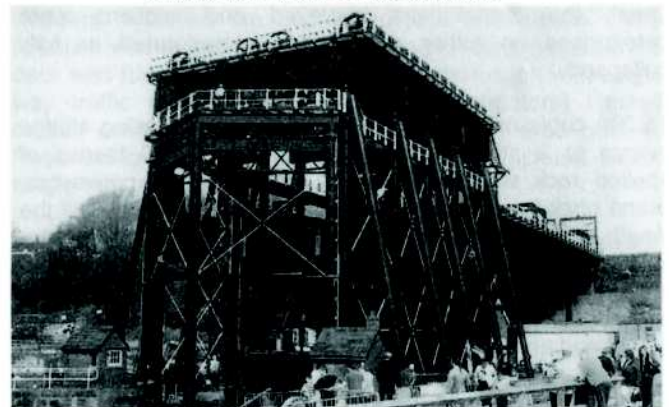
Attendees at awards ceremony

On 21 November 2002 Professor Adrian Long, President of the ICE, presented framed certificates to representatives of all parties directly involved in the nine projects, at a ceremony in the Smeaton Room at the ICE in London.

Grateful thanks are again due to English Heritage, Railtrack and British Waterways for their continuing financial support which covered running costs. Support-in-kind was again provided by ICE and the CSS Bridges Group.

PROJECT DESCRIPTIONS – AWARDS

Anderton Boat Lift Restoration



The Boat Lift (HEW 286) was built in 1875 to link the Trent and Mersey Canal to the Weaver Navigation, 17 metres below it. Canal boats were carried in a pair of wrought iron caissons, 23 by 5 metres, with gates at each end. The caissons were supported on rams working in the cylinders of hydraulic presses.

In 1908 a new electrically driven mechanical operation was installed, supported on a new steel structure built over the original. The caissons were then suspended from wire ropes, and counterbalanced by cast-iron weights. It ceased operation in 1983.

Having secured a grant of £3.3m towards the £6.0m cost of restoration, owner British Waterways undertook the roles of main designer and main contractor in an ambitious project aimed at restoring this Scheduled Ancient Monument back to working order. Extensive steel corrosion meant that over

On the Saturday with a reduced number of people, we discussed our various routes home. One was going via a disused canal in Somerset. Another was going via several water towers not previously visited. I went up the M5 to Portishead for a view of the new/old Severn Bridges, only to realise a much better view is obtainable from a place called Severn Beach, accessible behind Avonmouth industrial area. The trip home was then marred by a one hour wait in roadworks on the M5 near Gloucester, so I think I'll stick to A303/M3/M25/A12 in future!

THE CHAIRMAN'S COLUMN by Professor Roland Paxton

Congratulations and many thanks to all who contributed in any way to this year's outstanding Historic Bridge and Infrastructure Awards (HBIA). It was particularly pleasing to note the range and quality of the awards in *New Civil Engineer's* three-page spread actually published on 21 November, the day the awards were presented. Also, that two of the winners, Standedge Tunnel (1811) and Anderton Boat Lift (1875), were projects for which the Panel gave letters of strong support at their funding stage. On adjudication at the former it was a bonus to find near Marsden Visitor Centre an early nineteenth century cast iron bridge with straight beams and millstone grit jack arches.

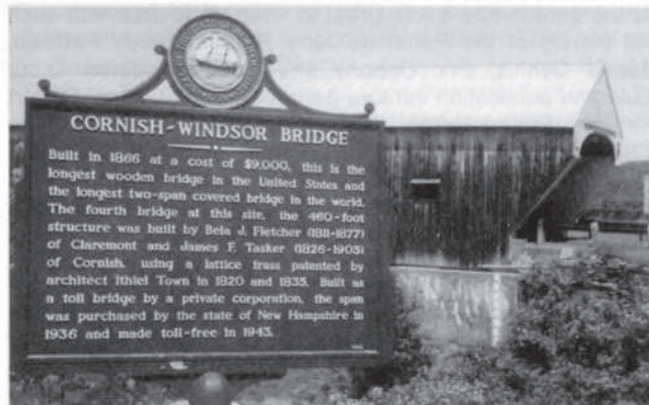


Anderton Boat Lift on HBIA adjudication visit –
lifting mechanism, 1908
© Michael Jones

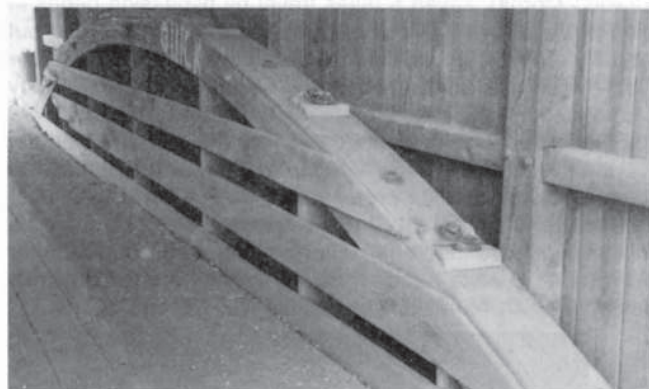
More about my summer visit to the USA. Under the energetic guidance of Tom Carroll, Director of the Hudson Mohawk Industrial Gateway, we travelled from the Hudson across Vermont and enjoyed the variety and scale of the exhibits at the American Precision Tool Museum at Windsor. It was housed in an old mill building, the machinery in which c.1850 had been powered by turbines. Then across the Connecticut River into New Hampshire on the 460ft long 2-span, timber-covered Cornish–Windsor Bridge with Town trusses, noting the command "WALK YOUR HORSES OR PAY A TWO DOLLARS FINE". In the hinterland nearby, two small covered bridges were inspected with 5 & 7 element (each 2in nominal thick) laminated timber bowstring arches with vertical hangers reminiscent of early nineteenth century American practice. Dr Carroll is to be congratulated for organising a public visit from New York State to promote knowledge of these fascinating works.



American Precision Museum, Windsor –
Dr Carroll and c.1850 turbine relics
© Roland Paxton

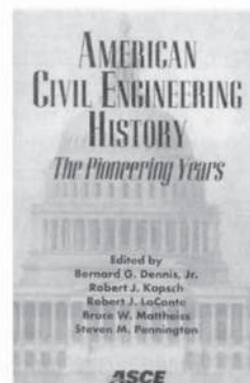


Cornish–Windsor Bridge, New Hampshire
© Roland Paxton



Vermont – covered bridge with laminated
timber bowstring arches
© Roland Paxton

ASCE's 150th Anniversary Conference in Washington DC attracted over 3,000 delegates and its History and Heritage Committee, chaired by Professor Henry Petroski and supported by Vice-President Dr Jerry Rogers, made a outstanding contribution to a truly memorable occasion. This was organising the presentation and publication at the conference of a choice selection of invited papers covering the pioneering history of American civil engineering. This 550-page authoritative volume, *American Civil Engineering History*, comprises 22 papers covering the birth and early development of the subject including, transportation systems, building materials and methods, water supply systems, preservation case studies and perspectives from afar. It is also recommended as a university textbook. I contributed *A British perspective on American civil engineering achievement before 1840*, which provided 'a glimpse of the new frontier where America's rapid growth and expanding boundaries defined a unique engineering approach not found in Britain or continental Europe.'



Book: *American Civil Engineering History – The Pioneering Years*. ASCE, 2002. ISBN 0784406545

BRINDLEY GATES – FURTHER CORRESPONDENCE by Brian Crossley

At the conference it was great to keep up-to-date with such old friends of the Panel as Jerry Rogers, Henry Petroski, Bernie Dennis, Eric DeLony and Dario Gasparini – our Culmann publication venture partners, Frank Griggs, Robert Kapsch, Emory Kemp, Alistair McKenzie – Chair of the CSCE's equivalent of PHEW from whom I invited a *Newsletter* article, Antonio Mattarucco – with whom I visited three museums in a morning – and, by no means least, Robert Vogel of Gothic Engineering and Machine Works fame.

Following the conference, I was kindly taken by Robert Kapsch and Bernie and Susan Dennis c.150 miles west of Washington DC to see, and walk through, Paw Paw Tunnel on the former Chesapeake and Ohio Canal. This 3,118ft tunnel built 1836-1850, c.24ft wide and of similar height, probably the largest in America at the time (Designer, Ellwood Morris), saved 5 miles travel by bypassing bends in the Potomac River. It was planned to be built in 2 years, but actually took 14, by which time the railway had reached the Ohio River and the canal was curtailed at nearby Cumberland with a much reduced potential. Dr Kapsch, now the Senior Scholar in Historic Architecture and Engineering for the National Park Service, who had acted during the tunnel's recent tasteful preservation as Project Engineer of the Paw Paw Tunnel Physical Assessment Project, proved a most informative cicerone. He had prepared especially for our visit a 19-page handout on the tunnel, a copy of which has deservedly found its way into the ICE Library.



Paw Paw Tunnel 1836–1850 – Dr Kapsch (left)
and the Dennis's
© Roland Paxton

Further to my account of Fairmount Waterworks, Philadelphia in the last *Newsletter*. In November I managed to visit these fascinating works again, this time with Ed Grusheski, General Manager of the Water Department, who had presented an outstanding paper on the works at the ASCE Conference. It transpired that the \$29m. Interpretative Center had not yet been completed because of the setback caused by the fire in the old engine house that is to become a restaurant. Excellent progress is now being made towards the formal opening planned for next summer.



Fairmount Waterworks – roof details of 1812–1815 engine
house revealed by fire damage
[compare with view in *Newsletter* No.88]
© Roland Paxton

The correspondence on Brindley Gates in the last *Newsletter* reminded me of an experience on the Bridgewater Canal whilst obtaining my site experience many years ago, in preparation for chartered membership of the ICE.

At the time I was employed by the Atomic Energy Authority and was seconded to their Site Team at Daresbury a short distance west of Warrington on the banks of the Canal. The project was to construct the 7Gev Proton Synchrotron, which is an underground laboratory undertaking research into the properties of matter at the speed of light. A series of very large magnets arranged in a circle accelerate the particles to the speed of light, in the process generating a lot of heat. The magnets were water-cooled hence the site's proximity to the Canal.

It was intended to drive two 36 inch diameter sleeves under the canal to provide the site intake and outfall (about 3 miles away), but before doing this an 18 inch diameter sleeve was to be driven under the Canal in a different location for the foul sewer outfall. The sleeve for the sewer was augured under a canal embankment approximately 8 meters high built on sloping ground, from a pit in a field on the uphill side of the canal. At the end of the first day, the auger had been driven approximately half way under the embankment. The next morning I was watching operations from the towpath on the other side of the canal in preparation for the auger arriving at the reception pit. A few minutes after the auger commenced turning, bubbles appeared in the middle of the canal and within 10 minutes the bank of the canal was breached on the uphill side. Unfortunately a 3 feet diameter culvert was only a short distance away and the breach began to drain through the culvert.

The alarm was raised and sandstone excavated from a local quarry was end tipped into the breach. This partly stemmed the flow until British Waterways could place stop logs at locations some distance away and 5 miles of canal was drained with major flooding down the hill from the canal embankment, including closing the London to Glasgow West Coast Main Line! The explanation for the failure was piping through the fill material of the embankment which had probably been end tipped without compaction during construction.

Subsequently all pipe crossings were undertaken in open cut, the canal lined with puddle clay and the canal opened after about 6 weeks.

The purpose of this rather long-winded story is that when the canal was drained, a wooden gate valve was discovered beneath the towpath which had been covered over – the drained canal revealing the brickwork around the valve below water level. The purpose of this gate was to drain the canal into the adjacent stream downstream of the culvert under the embankment. All the components of the gate valve were removed as it was no longer serviceable and I had it transported to the Monk's Hall Museum in Eccles which held artifacts in connection with the Duke of Bridgewater's Coal Mines nearby and the Bridgewater Canal which passed through Eccles on its way to the Barton Aqueduct and Manchester. Monk's Hall Museum is now closed and I have no idea where the gate valve is now.