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Historic Bridge and Infrastructure Awards 2004

by David Greenfield

On 18 November Gordon Masterton, Senior Vice-President of the ICE, made the presentations at the seventh annual Awards ceremony, celebrating excellence and innovation in conservation. There were 22 nominations this year, our largest number to date.

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 reported that the standard of many entries was exceptional. In the event, they selected five outstanding projects for Awards, with Commendations going to a further four, and a Special Recognition to another.

We were pleased to welcome to the ceremony elected members from the County Councils of Kent and North Yorkshire in the company of their engineers. Also, a member of the "Friends of Myton Bridge", an action group which was instrumental in fund-raising which instigated the rescue and conservation of a derelict historic bridge.

Grateful thanks are again due to English Heritage, Network Rail and British Waterways for their continuing financial

support which covered running costs. Support-in-kind was again provided by ICE, CSS Bridges Group and NCE.

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

- **Whorlton Suspension Bridge restoration**, County Durham
- **Pontcysyllte Aqueduct and Trevor Basin refurbishment**, Llangollen
- **Waterloo Train Shed Roof refurbishment**
- **Hungerford Canal Bridge strengthening and refurbishment**, West Berkshire
- **Myton on Swale Bridge refurbishment**, North Yorkshire

The four **Commendations** went to:

- **The King George V Lift Bridge strengthening and painting**, North Lincolnshire
- **Dundas Aqueduct restoration**, near Bath
- **Wye Bridge refurbishment**, Kent
- **Edstone Aqueduct restoration**, Warwickshire

A **Special Recognition** went to:

- **The Brunel Canal Bridge Salvage Operation**, Paddington

Each project is briefly described below.

PROJECT DESCRIPTIONS – AWARDS

Whorlton Suspension Bridge Restoration



This suspension bridge was completed in July 1831 to the design of John Green of Newcastle. It crosses the River Tees about 3 miles east of Barnard Castle, County Durham, and is now a Scheduled Ancient Monument and Grade II* Listed Building. It spans 56m and is still supported by the original chains, which comprise links made up from 3m long flat wrought iron bars. The 5.5m wide timber deck is suspended from the cables at 0.5m intervals.

Following gale damage in the 1970s, a 3 tonne weight restriction and a 1.8m width restriction were imposed. By 2003 many deck timbers needed replacing. In addition, flexing of the deck under modern traffic loading had

Educated at the Naval School New Cross, he entered the Royal Navy in his fifteenth year and served for several years on the Australian station. He was promoted to lieutenant in 1855, and was sent to the Pacific Station to join *Ganges* under the immediate command of Commander Hugh Talbot–Bourgoyne, who was afterwards lost when in command of *Captain*.

Following commands on the West Coast of Africa, he was promoted to Captain in 1866. Four years later he was appointed to take command of the Indian troopship *Jumma*.

The sea trials of 'Devastation'

"It was arranged that ... Mr William Froude – to whom the original researches on the behaviour of ships at sea had given great authority – should (direct the trials) and make scientific observations with the aid of novel instruments invented by himself. His report was published as a Parliamentary paper and set the public mind at rest." (Lords, 1912).

I have been unable to ascertain if Froude, as the foremost contributor to the body of knowledge on ship stability, had been approached by the Admiralty, or had himself pressed for his services to be employed. It is, however, very likely the former, as in 1870 he had, in recognition of his work, been elected a member of the Royal Society (and received the Society's Royal Medal in 1876).

Thus in October 1873 Richards was appointed to command the *Devastation*, with a brief from the Admiralty to conduct exhaustive sea trials in order to settle the sea–going stability question once and for all. The *Devastation*, and the other ships involved in the trials, were ordered to the Mediterranean. "Captain Richards' appointment to this exceptional command was, therefore, in mark of the high estimation in which his professional qualifications were held by their Lordships, and this estimate was fully justified by the manner in which the trials were conducted and reported upon by Captain Richards." (Lords, 1912).

The co–operation between the two men must have been excellent, because a warm friendship began, which continued until Froude's death.

Froude and Richards in South Africa

After the *Devastation* trials, Richards was based at Chatham Dockyard in Kent until October 1878, when he was promoted to Commodore and appointed Senior Officer on the West Coast of Africa, with his flag in *Boadicea*. War with the Zulus was imminent, and he sailed for the Cape. On his arrival, he received news of the British defeat at Isandhlwana (22 February 1879), and promptly took his ship to Durban.

There he, together with 227 other officers and men, formed a Naval Brigade, "which largely averted the danger of invasion after the Zulu victory at Isandhlwana." (Rosenthal, 1966, p.313). (Author's comment: Other scholars have since disputed that Cetshwayo intended to invade. (Saunders, 1988, pp.183 and 185)).

Richards and his Brigade were present at the relief of Eshowe (3 April) and the Battle of Ulundi, which finally broke Cetshwayo's army (3 July).

In the midst of these Zululand activities, Froude arrived in Simon's Town "as the guest of Commodore Richards". (Lords, 1910). Whether he took ill while at the Cape, or he was sick before arrival, or what other circumstances arose, I have not been able to ascertain, but he died on 4 May 1879. It is certain that the two men did not see each other

in South Africa. Froude lies in the Old Burying Ground, Simon's Town.

Richard's further career

Richards and his men presumably returned to Boadicea after the Anglo–Zulu War, but reformed as the Naval Brigade with the start of the first Anglo–Boer War, and were present at the British defeat of Laing's Nek (28 February 1881).

Richards had been made a CB on 27 November 1879, and on 24 May 1881 was made KCB. On 9 June 1882 he was promoted to the rank of Rear–Admiral and terminated his service on the Cape Station and indeed his direct connection with South Africa.

From 1882 to 1885 he served as Junior Lord of the Admiralty and then became Commander–in–Chief in the East Indies and thereafter of the China Station. In 1893 he was made Senior Lord of the Admiralty, the "highest position which a British Naval officer can occupy". (Lords, 1910, p.4). In 1898 he was promoted to the rank of Admiral of the Fleet. He retired in 1899 and died in Gloucestershire on 28 September 1912.

While there is no evidence that he actually visited Richards Bay, he is commemorated in the name of the bay and, since the 1970s, port and town that has been created, not far from where he campaigned with his Naval Brigade. (Standard Encyclopaedia, 1973, p.342).

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Forth Bridge Rivets For Sale Information from Roland Paxton

There is a further opportunity to own one of the Forth Bridge's 6,500,000 rivets!

In the past, the Forth Bridges Visitors Centre Trust <http://www.forthbridges.org.uk> (a Registered Charity) which maintains a free exhibition at the Queensferry Lodge Hotel, North Queensferry, has raised modest funds by encapsulating Forth Bridge rivets for sale to the public. 125 rivets from tension ties are now available from the 2004 refurbishment work.

The cost is £40.00 each, including UK postage and packing. Shipping internationally will be a further £5.00 (i.e., equivalent to a total of €65 or US\$90).

To purchase a rivet, e-mail: rivets@forthbridges.org.uk or telephone Dr Scott Arthur on 0131 451 3313.

Correspondence

Hollingwood Common Tunnel from Christine Richardson

In the September issue Roger Cragg wrote of the examples of canal boats being loaded or unloaded underground. Although strictly not in the same category boats did work underground in Derbyshire – the Hollingwood Common Tunnel linking to the Chesterfield Canal, near Staveley.

It is a moot point whether or not this tunnel should be classified as being part of the Chesterfield Canal as its origins are unknown, but it was described in John Farey's report, published in 1817. "The Hollingwood Common tunnel is one mile and three quarters long, not connecting with the canal, but kept one foot lower by means of a culvert under the canal: the whole of this length, except the first three hundred yards, is driven in the 'Deep-end or Squires' coal-seam. It is used for draining, and also for working the same, and two other seams near it ... Its southern end is about eighty yards below the surface. The height of this tunnel is six feet, its width five feet nine inches, and the depth of water therein, two feet: on which boats are used, twenty-one feet long and three feet six inches wide, that hold seven corves, weighing together twenty to twenty-two cwt. When these tunnel boats arrive at the side of the canal, a crane is used to hoist up these boxes, and empty their contents into a canal boat; this curious colliery belongs to his Grace the Duke of Devonshire, and is wrought on his own account, under the direction of Mr George Dickens, of Staveley, his agent."

The tunnel would seem to have been a private venture by the Duke, which may account for the waters of the tunnel and the canal not mixing. Even so with the necessity of a culvert under the canal it is very likely that the construction of such a venture would have been included in the minutes of the Chesterfield Canal Company, but nothing is noted prior to May 1780, the date of the last set of minutes we have.

Late in the nineteenth century the Chesterfield Canal's route near Staveley Works was straightened to allow the construction of a railway and the canal then sliced across the tunnel a few yards from the original junction, which was lost. Nothing is known of when coal mining operations via the tunnel ceased. An inspection was made in 1912 when two men lowered themselves down one of the shafts – and found the disused tunnel to be in good state of preservation.

The location of Hollingwood Common Tunnel is currently marked by a small grill on the non-towpath side of the canal (OS 746417) which, at this point, is part of a navigable five miles, part of the on-going restoration of the Chesterfield Canal. The Ordnance Survey of 1883 shows a number of capped shafts along the line of the tunnel some of which remain. The tunnel terminated under West Wood (OS 729415).

Unidentified Bridge from Michael Gould

Ron Cox and I have been asked to identify the bridge illustrated below – a painting by David Bond Walker, dated 15 February 1950.



As far as we are aware it is not located in Ireland. It is possible that it is a fictional compilation or two bridges superimposed – the scale looks a bit odd as do the wooden handrails, especially if it is a railway viaduct. If any reader can identify it please contact me: **Dr M H Gould BSc MPhil PhD MICE, 19 Glencreagh Drive, BELFAST, County Antrim BT6 0NJ**

Book News

***Dunkeld – Telford's Finest Highland Bridge* by Christopher R Ford. Published by Perth and Kinross Public Libraries, 2004, pp.95. £6.95**

by Jim Shipway

This book is the story of the design and construction of the masonry arch bridge over the river Tay at Dunkeld by Thomas Telford, Scotland's greatest civil engineer. It also provides a detailed description of an earlier bridge over the Tay at this site, possibly built in the sixteenth century, some 300 years before Telford's bridge, which was opened in 1808.

The book contains a wealth of detail and is obviously the result of painstaking research by Chris Ford in which he uncovered information held by the Atholl estates in Dunkeld, and by the Institution of Civil Engineers' Library, among other sources. Some of the archive material was written in Latin, but he has proved equal to the task of translation, which must have been daunting indeed!

The method of financing the bridge was unusual and generated many problems. The existing ferries across the Tay belonged to the 4th Duke of Atholl, who generously offered to pay one-half of the cost of the bridge if the Government would pay the other half. The Duke proposed that a toll should be levied on bridge traffic to repay his investment, and when this was accomplished, the bridge would become free of tolls. Telford estimated the cost of the bridge would be some £15,000, but due to mismanagement the cost was twice as much, and the bridge was burdened with tolls until 1874, when the local authority took it over. The tolls caused much unrest, even riots, among the people of Dunkeld, and others. Chris Ford relates the complex history of the tolls with much skill.

Telford was a towering figure in the engineering world, with a tremendous workload which meant that he could only devote limited amounts of his time to individual projects. Consequently he was only able to visit Dunkeld at infrequent intervals, and the work of organising and supervising the construction of the bridge fell upon the Atholl estates' factor, Thomas Palliser, and the master mason Patrick Brown.

Chris Ford writes of a remarkable design change at the start of construction in the spring of 1805 to improve the