



THE INSTITUTION OF  
CIVIL ENGINEERS

# PHEW NEWSLETTER

Panel for Historical Engineering Works

MARCH 1998 no.77

## CONTENTS

*Civil Engineering Heritage: Ireland*  
*Irish Landmark Plaques*  
*The Leaning Towers of Pisa and St Chad's*  
*The Chairman's Column*  
*Conference Report*  
*Correspondence*  
*Book Reviews and Notices*  
*HEWs in the News*  
*Editor's Note*

## CIVIL ENGINEERING HERITAGE: IRELAND by The Editor

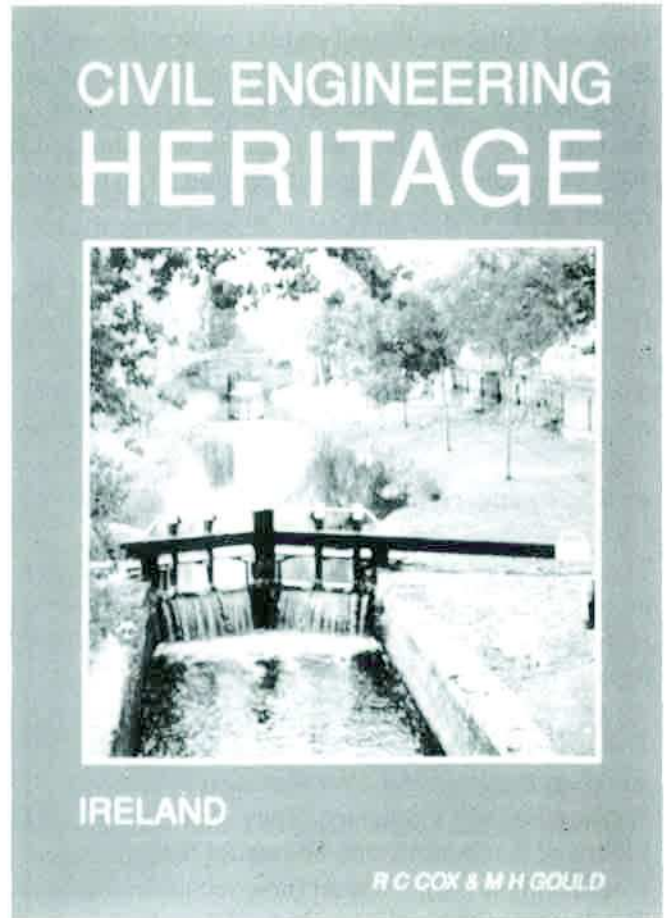
February 1998 saw the publication of the Panel's fifth volume of its *Civil Engineering Heritage* series, which covers the whole of Ireland. It has been jointly authored by Dr Ron Cox and Dr Michael Gould who have been supported in their work by the Heritage Society of the Institution of Engineers of Ireland.

Its presentation follows the pattern of other volumes with each of its seven chapters dealing with a distinct geographical area. Some 200 works are described, many are illustrated by photographs or drawings. The text is designed to provide a better understanding of the contribution made by the civil engineering profession to Ireland's economic and social development.

It includes the engineering achievements of Alexander Nimmo, John Macneill, William Dargan, John Killaly and many others who developed Ireland's civil engineering infrastructure.

As with other recent books in the series the volume is presented in an attractive cover which is illustrated by the Grand Canal, Dublin.

Work on remaining volumes in the series continues to progress well. The volume for *Southern England* was re-printed at the end of 1997 and work on the re-printing of that covering *Eastern and Central England* is well advanced. There remain two volumes to complete the series, with work continuing steadily on both the Scottish volume and that dealing with London and the Thames Valley.



Available from Telford Bookshop (tel: 0171 665 2019)  
Price £12.50

## IRISH LANDMARK PLAQUES

Information supplied by Ron Cox<sup>1</sup>

Iarnrod Eireann (Irish Rail) were recently the recipients of two Landmark plaques. These are engineering heritage plaques erected to commemorate works of exceptional quality and those who designed and constructed the works. The scheme is organised by the Institution of Engineers of Ireland Heritage Society.



Chetwynd Viaduct

Photograph taken c.1900, copyright unknown

### • Chetwynd Viaduct (HEW 3037)

The first plaque, sponsored by Malachy Walsh and Partners, Consulting Engineers of Cork, was unveiled on the main platform at Ceannt Station, Cork and it commemorated The Chetwynd Viaduct which carried the Cork, Bandon and South Coast Railway. The viaduct was designed by Charles Nixon, a pupil of Isambard Kingdom Brunel and the contractor was Fox Henderson and Company. It was constructed between 1849 and 1851 and it spanned a valley to the south west of Cork. The four span structure was damaged in 1922 during the Civil War and repaired. The line was closed in 1961.

The unveiling was carried out by the President of the IEI, Mr Phil Callery in the presence of the Chairman of the Cork region, the Deputy Lord Mayor of Cork, the Vice President of the IEI, Directors and members of the staff of Iarnrod Eireann and members of the IEI.

### • The Inchicore Railway Works (HEW 3203)

The second Landmark plaque, commemorating the building and opening of the Inchicore Railways Works in the 1840s, was presented to Dave Waters of Irish Rail by the IEI President.

The railway works were designed in the 1840s by the Architect Sancton Wood for the Great Southern and Western Railway Company. They were a self-contained community with houses for the workers, a school (still in use), a chapel (now rebuilt in the Straffan Steam Museum) and a social centre.

<sup>1</sup> Based on the *Engineers Journal*, August 1997, Volume 51, number 7, page 60.

## THE LEANING TOWERS OF PISA AND ST CHAD'S

The Editor

The history of civil engineering rarely attracts attention from the national press, but a rare exception was made on Tuesday 20 January 1998 when the *Daily Telegraph* described how the technique, currently proposed to prevent the demise of Pisa's famous leaning tower, was pioneered by James Trubshaw in the 1830s.

Trubshaw's innovative technique was described in his biography<sup>1</sup> from which the following extract is taken:

The name of Trubshaw is remembered in one small village in Cheshire in association with a church, but for his engineering skill rather than

his architectural design. This is in Wybunbury, near Nantwich, where Trubshaw restored the 'leaning tower' of St Chad's Church ... In 1758, the tower was recorded as leaning northwards by 2 feet 11½ inches and in 1790 this had increased to 3 feet 5¼ inches ... Just over 40 years later when Trubshaw started his restoration, the tower was leaning over by 5 feet 7 inches and there was a split in the building up the centre...

Carefully and slowly Trubshaw restored the tower to the perpendicular and the crack became imperceptible. This he did quite simply without any 'wonderful machinery or secret inventions'. Trubshaw dug down to the foundations and under the higher side bored a series of holes which he filled with water and corked up with marl and left overnight. The water softened the soil and a quantity was removed and the weight of the tower caused it to sink on that side. This was repeated until the tower was restored to its proper position, the succeeding holes ... being bored a shorter distance through the foundations than the earlier holes. The old church was demolished in 1832 ... Trubshaw built his church, retaining the tower, ten yards from the position of the previous one.

<sup>1</sup>Bayliss, A. *The Life and works of James Trubshaw (1777-1863)*. Stockport, 1978, pp.31-32.

Reference is also made in the *Architectural Magazine*, volume 1, 1834, p.209.

## THE CHAIRMAN'S COLUMN by Professor Roland Paxton

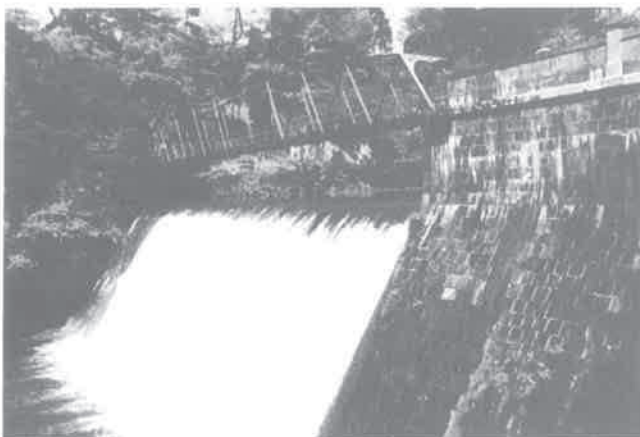
During my visit to Japan I visited historical engineering conservation sites in the northern provincial city of Akita. The city is surrounded by 'v'-shaped steep-sided wooded valleys, rice fields and angular shaped hills. It is famed for the high quality of its rice and beautiful women. Interspersed with technical visits were more opportunities to experience the delights of Chinese noodles and sushi (and to inspect it in its lively immediately pre-plate form!) in the congenial company of Professor Hanzawa my counterpart in JSCE. After inspecting a series of historic warehouses formerly used in the rice industry and now tastefully refurbished to form part of the Akita Junior College of Arts and Crafts, whose divers activities now include the making of holograms including the world's largest, I was shown the ruins of Akita Castle. At the castle site a resident

archaeologist explained progress on its painstaking recreation in cedar wood (I think?) from archaeological evidence and involving extensive timber construction.



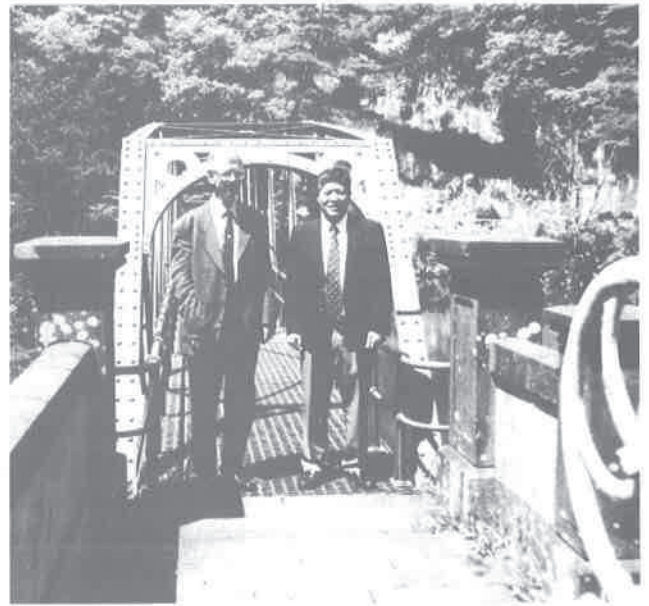
Akita - old rice warehouses converted into a college of art and craft  
Photograph courtesy of the college

I then inspected the oldest part of Akita City waterworks, which is based on gravity supply from an impounding reservoir, and in particular its concrete, masonry faced, Fujikura dam. The waterworks were started in 1903 to supply a population of 40,000. In 1884-1887 a scheme had been designed by the notable British engineer W K Burton, but it could not then be funded. The scheme as constructed from 1905-1911 was the eleventh oldest in Japan and with later works it now supplies a population of over 300,000. Its most impressive early feature is the dam, the road access to which is slightly elevated above the level of the adjoining rice fields (and adds!)

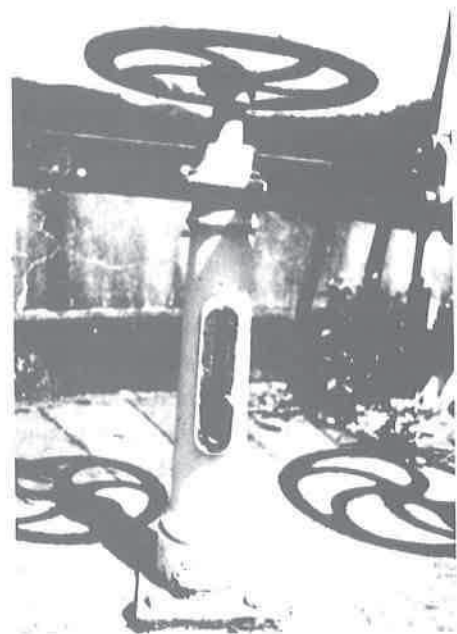


Fujikura Dam built 1905-1911  
Photograph courtesy of Roland Paxton

I was shown over the dam by the city's Water Engineer Mr Mayoshi Saito in the company of Dr Orita and Professor Kubota of JSCE. It is the 7<sup>th</sup> oldest waterworks dam in Japan. It is 55m long and 17m high and the Warren truss footbridge about 30m in length. Mr Saito said that the dam was still giving excellent service after nearly 90 years and referred particularly to the excellent performance of the valves which he thought had been made in Europe. I was delighted to be able to make out the inscription on their head-stock casings, just visible under some ten layers of paint, which read 'Glenfield & Kennedy, Kilmarnock' and to inform him that, like many good things, it came from Scotland!



Fujikura Dam - Warren truss, 1911  
with Mr Mayoshi Saito  
Photograph courtesy of Professor Kubota

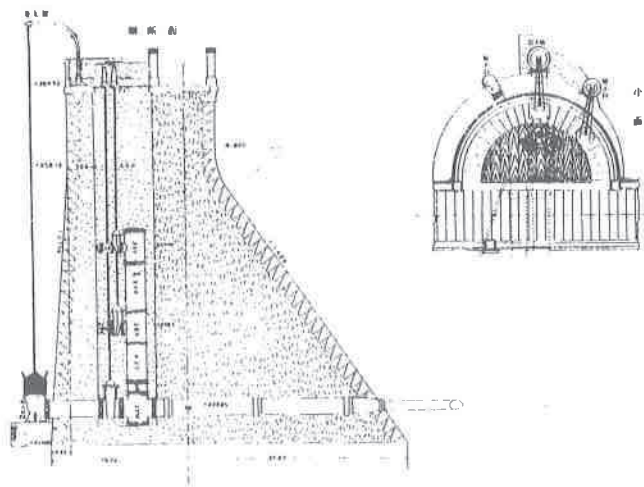


Fujikura Dam - Glenfield & Kennedy valve  
Photograph courtesy of Professor Paxton

## CONFERENCE REPORT

by Peter Cross-Rudkin

### • Perceptions II



Fujikura Dam - cross section

I hope that by now our readers are becoming aware of the effort the Panel is making to improve the quality of its historical significance assessments for engineering works. Sub-panels have been set up on *masonry bridges, cast iron bridges, water towers, windmills, dry docks and dams* and it is planned to have others soon on *concrete bridges and seaside piers*. Although their work is far from complete the Panel is undoubtedly already the leading authority in this field and its expertise is of particular value in advising government agencies, owners of such works and others interested in an efficient prioritization of candidates for preservation for which scarce funding resources are being sought.

In the past the Panel has provided valuable advice on such matters but in a less rigorous way than is now becoming possible. The facilitation and further improvement of this process has already begun, as instanced by the following recent although hard-won example. Following the receipt of numerous applications for funding in respect of seaside piers, the Heritage Lottery Fund approached the Institution of Civil Engineers' Director General and Secretary Roger Dobson for assistance. The Institution agreed to help and the Panel was asked if it could identify and indicate the historical engineering significance of seaside piers. Following a herculean effort over Christmas and the New Year by Paul and Anna Dunkerley, to whom the Panel and the Institution are greatly obliged for their impressive 93 page report, it was possible to make a prompt and useful reply which attracted a fulsome letter of thanks from the Fund and perhaps made the Director General and Secretary more fully aware of the Panel's usefulness!

Many readers of this Newsletter will have a copy of *Perceptions of Great Engineers*, edited by PHEW member Denis Smith, the proceedings of a conference held at the Merseyside Maritime Museum in 1993. A second conference, on the same topic and at the same venue, was held on 22 November 1997. Eight more papers on themes related to engineering biography were presented, offering a variety of approaches. Our Institution of Civil Engineers' Librarian, Mike Chrimes, explored the problems of identifying civil engineers in the period before civil engineering was recognised as a separate profession, and described how work on the proposed Biographical Dictionary of Civil Engineers had expanded our knowledge of these people. The editor of this Newsletter, Bob Otter, preferred the prosopographical approach and considered what might be learnt from the tally of contributions to the early Proceedings of the Institution of Civil Engineers. Two papers considered some reasons why the existing works on Rennie and Rendel are not as complete as they might be and two more expanded on the lives of engineers discussed in 1993. A rivetting review of the information to be gleaned from examination of physical remains, in this case of an early locomotive, was a reminder that there are other sources than documents and a final paper posed some thought-provoking questions for historians of technology.

It was a little surprising that no less than six of the papers dealt with civil engineers or civil engineering. Some of the contributors to the day were a little constrained by the demands of time from developing their arguments fully, but the proceedings are to be worked up into book form as before. This should result in a worthy companion to *Perceptions I*.

### CORRESPONDENCE ...

Dear Editor

The diaries of Walter Montgomerie Neilson are held in the Mitchell Museum, Glasgow. He was the son of James Beaumont Neilson, FRS, inventor of 'hot blast for furnaces' which did for iron manufacture what Arkwright did for the cotton trade. These diaries contain details concerning the building of the Suez Canal which I do not think are generally known.

On 25 April 1859 the digging of the Canal by picks and baskets had continued for ten years and although