THE INSTITUTION OF CIVIL ENGINEERS

Panel for Historical Engineering Works

NEWSLETTER

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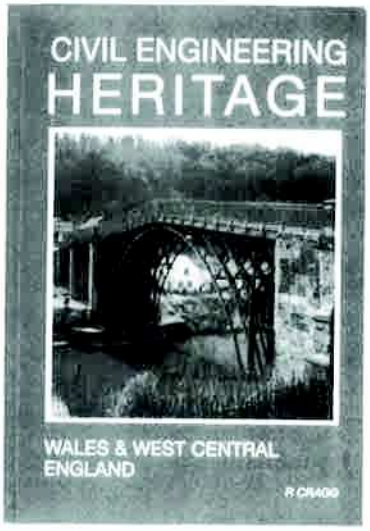
CIVIL ENGINEERING HERITAGE: WALES & WEST CENTRAL ENGLAND

by The Editor

1986 saw the publication of the Panel's second volume in the series *Civil Engineering Heritage* which covered Wales and Western England. It was edited by the late Bill Sivewright who was a long-standing and enthusiastic member of PHEW. The revised edition was published in April 1997. Roger Cragg, Panel member for the Midlands, has undertaken the revision, and has been greatly assisted in his work by a substantial number of contributors. Appropriate changes have been made in respect of the selection of items and to the text. As other recent books in the series, the volume is presented in a similar attractive cover which is illustrated by the world famous Iron Bridge at Coalbrookdale.

As its title suggests, the book covers Wales and the western counties of England from Cheshire in the north to just south of Bristol and extending eastwards to include Chester, Gloucester and Swindon.



Thomas Telford Publishing, 1997
from: ICE Bookshop (0171 665 2019) @ £12.50

Compared with its sister volumes, the book's eight chapters are a little less dependent on county boundaries with Wales' historical works described in three chapters. Over 220 works are described, many are illustrated by photographs or drawings, and the text is designed to provide a better understanding of the contribution made by civil engineers to the economic and social development of the regions and the county as a whole.

Work on other volumes in the series is continuing. At its recent Spring Meeting, the Panel were advised that stocks of the volumes covering *Southern* and *Eastern and Central England* were rapidly diminishing. Both were published in 1994 and it is a source of some satisfaction that work on reprints of both volumes is currently required. Good progress was reported in respect of the series' three outstanding volumes relating to *Ireland*, *Scotland* and *London and the Thames Valley* with plans for the publication of the Irish volume, jointly authored by Ron Cox and Michael Gould, being well advanced.

NORTH WESTERN AREA HISTORICAL GROUP CHANGES

by Paul Dunkerley

After seven years at the helm, the long-serving North Western Area Historical Engineering Group Honorary Secretary, J Neil Morton, has decided to hand over to Jim Parry of John Moores University, Liverpool. In his time as Honorary Secretary, Neil has been tireless in promoting civil engineering history in the North West, and has led the expansion of the Group Committee by co-opting representatives from other Institutions such as the Mechanicals, the Structurals, the Chemicals, and the Electricals, as well as the Newcomen Society, the Merseyside Maritime Museum, and local universities. The resulting Group Committee now has representation from a wide range of engineering disciplines. Joint meetings and events have been highly successful, especially commemorative plaque ceremonies with the Institution of Mechanical Engineers. The Group normally holds four evening technical meetings during the winter season and a summer family outing, which are usually all well attended. Next year's North Western Area Historical Engineering Group Chairman will be Alan Brookes of AMEC.

THE CHAIRMAN'S COLUMN

by Roland Paxton

Before its Spring meeting the Panel enjoyed an instructive presentation on listing by Dr Martin Cherry and Mr Robert Hawkins of English Heritage. Dr Cherry outlined the legislative framework governing the work of English Heritage and then described the criteria for listing historic structures. Recently there had been a move away from the traditional geographical emphasis towards a thematic approach which had enabled the engineering significance of a structure to be more accurately taken into account. This improvement had stemmed from their recent study of textile factories in Greater Manchester from which it was evident that the descriptions of listed structures usually concentrated on architectural detail rather than design purpose or constructional significance. This finding did not surprise most Panel members, but they were pleased to note that the study had led to the selection criteria for listing being refined to focus on the completeness of the structure, technical innovation and the industrial aesthetic. Dr Cherry was interested to know of the work of the Panel towards classifying the merit-worthiness of historical engineering works. Both bodies wished to achieve the best possible accuracy in listing, not least, because this was a key yard-stick for prioritising limited resources on conservation.* It was agreed to meet again soon.

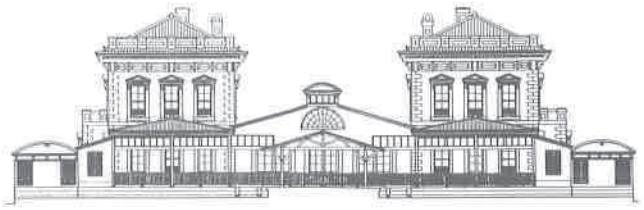
One of the most fascinating experiences of my JSCE tour was a visit to the historic Shiodome site in Tokyo. The huge site, which had been cleared for redevelopment, was being assessed and examined by archaeologists using a workforce of over a thousand in what seemed to be an impossible race against time. During the Edo period of Japanese history (1615-1868), the site was occupied by the residences of daimyo (feudal lords) and an artillery ground. During excavation the intact remains of much of the 17th century water supply system at the site, consisting of hundreds of metres of wooden pipes and wells, had been uncovered. The water had been supplied by gravity from Hamura on the Tama River to Yotsuya-Okido (now part of central Tokyo) in a 43km long open channel from the Tamagawa waterworks, established in 1654. From Yotsuya it was then fed to the south west of the city. The waterworks continued to play an important part in the daily life of the city until 1901. The scheme was similar in principle to Myddleton's New River water supply to London in 1613, but probably more extensive.

Stone ducts were used as the principal water mains and were called *mannen-hi* (10,000 year or long lasting pipes). The wooden pipes were either 'hollowed out' with capping planks or of 'joined construction' made up of sawn planks butted together. Two methods of jointing were used. One was to cut away the respective inner and outer faces of opposing pipe-ends, and then fit them together. The other one used a separate coupling box or well into which the pipes were thrust from each side. This junction arrangement was also used to alter direction or couple pipes of different diameters. Many inscriptions and brands were found on the various components.

The Edo period was followed from 1868 by the Meiji era, during which Japan was opened up to external influences and modernised. In 1869 a British offer of assistance to help establish railways was accepted, including the line linking Tokyo to Yokohama from Shimbashi Station. This line became operational in 1872 and its impressive station designed and superintended by R P Bridgens was the first in Japan. Its site covered more than 22ha. and its many buildings included lodging for the engineers and foreign supervisors. These building were demolished by the great earthquake of 1923, but many foundations survived intact, including timber piling, and part of the 1872 station platform.

*(Readers may be interested to know that the recent AIA weekend meeting held at Ironbridge, attended by

over 40 participants was based upon the theme 'Problems Presented by the Preservation of Major Structures'. [Editor])



Shimbashi Station, 1872 (platform side)

Shiodome site - timber foundation pile clusters, c.1900

Shiodome - old timber pipe junction well, with Professor Kubota [courtesy Mr Onoda]

THE EARLIEST MASS-CONCRETE RAILWAY VIADUCT IN SCOTLAND - IS IT THE KILLIN VIADUCT? by Jim Shipway

Mention concrete railway viaducts to anyone with a knowledge of Scottish railway history and they will immediately think of the viaducts on the West Highland Railway Mallaig extension, which were constructed in 1897-1898. There are six of these viaducts between Fort William and Mallaig, engineered by Simpson & Wilson and constructed by Robert McAlpine & Sons. They are generally considered to be a pioneering work and the first of their kind in Scotland. However, more than ten years before that, in the mid-1880s, considerable concrete works were being constructed on railways in Scotland, both in Ayrshire and Argyll.

The Lanarkshire & Ayrshire railway began construction in March 1884, and in July of that year was authorised to build branches to Ardrossan, Kilbirnie and the port of Irvine. The Irvine Branch carried the line over the River Garnock by means of a bridge of four spans, the spans being of plate-girder construction carried on concrete piers and abutments. The engineers were Strain, Robertson & Thompson and the contractor was Robert McAlpine & Sons. The contract was awarded in November 1887. Robert McAlpine had been using mass-concrete for house-building and other minor works as early as 1876, and his enthusiasm for the material had early earned him the nickname of 'Concrete Bob'. The Garnock bridge, however, can hardly be considered to be a mass-concrete viaduct in view of its plate-girder spans, though the concrete piers (a maximum of 28ft high and 6ft 6ins. wide) were significant structures.

In Argyll, the Callander & Oban Railway had been completed in 1880, John Strain being the engineer for the later section from Dalmally to Oban. He had used mass-concrete for minor works such as culverts and retaining walls, and was known to encourage its use. At the time he was also appointed engineer for the 5.5 mile long Killin Railway, which joined the C&O line at Glenoglehead. This little railway was constructed in 1883-1886 and included a 5-span arched viaduct over the River Dochart which was completed in 1885. The contractor was MacDonald of Skye, who constructed the piers of the viaduct in rubble masonry and rubble concrete before going bankrupt and being relieved of the contract. The arched spans were completed in mass-concrete by John Best, together with the spandrel walls and parapets again in rubble masonry and rubble concrete.

The Killin Viaduct is therefore something of a hybrid. The five arched concrete spans are on a 45-degree skew,