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Editorial

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The first paper in this issue of *Engineering History and Heritage*, by Andrew Savage on the work of the UK's Railway Heritage Trust (Savage, 2012), draws attention to some of the difficult decisions that have had to be made when considering the conservation and restoration of historic railway structures, in particular bridges and viaducts. The funding available to the Trust is limited (currently around £2 million per annum) and, as a consequence, grants are relatively small in comparison with the total expenditure on a particular structure. For example, Stephenson's High Level Bridge across the Tyne at Newcastle attracted six grants from the Trust totalling £315 000, a small amount when compared with the £42 million spent on its restoration, but then the sympathetic restoration of an iconic in-service structure is always going to be an expensive undertaking.

Reading Rajib Chakraborty's paper on the ancient irrigation systems of Oman (Chakraborty, 2012) brought to mind Tredgold's 1828 definition of civil engineering as 'the art of directing the great sources of power in nature for the use and convenience of man' (Ferguson and Chrimes, 2011). The centuries-old traditional irrigation systems or aflaj in Oman, existing alongside their modern counterparts, serve to illustrate vividly the ingenuity of the early 'ingeniaria', the pioneers of the civil engineering profession. The aflaj are a unique and important water source that has made a major contribution to Omani society. Not only are they regarded as one of the most historical features of Oman, but they also represent the ability of the Omani people to create civilisation in the face of severe environmental challenges. In 2006, Unesco designated five of the aflaj as world heritage sites.

The need to provide adequate supplies of potable water to communities is, of course, an increasingly world-wide challenge – there can be no life without water. Unlike the aflaj of Oman and similar systems constructed elsewhere by the Arabs, more recent methods generally involve the extraction of water from rivers or from artificial reservoirs. The principal method of creating a reservoir involves selecting a suitable location into which one or more streams or rivers flow from a sufficiently large catchment area, and the construction of a dam (often an earth dam) across the line of the river(s). An earth dam is required to ensure that no water can pass through or under the dam. This requires a vertical core of impermeable clay and a vertical cut-off below the dam. The Silent Valley dam in the Mourne Mountains south of Belfast in Northern Ireland became a 'cause célèbre' on account of the difficulties met with when excavating for the cut-off trench, resulting in the contractor going to arbitration over the nature of the site investigation. In his paper, Phil Donald draws attention to the misinformation about the project and the engineers involved that has been allowed to circulate for over 80 years, and aims to set the record straight (Donald, 2012).

Jacques Heyman, Emeritus Professor of Engineering at the University of Cambridge, writes about the *scamilli impares*, an architectural term used by Vitruvius (30–20 BC) when referring to the small rise required to be given to the stylobate (a continuous flat coping or pavement supporting a row of columns) at the centre of the front and sides of a Greek temple (Heyman, 2012). He argues that they were closely related to the smallest Roman (or Greek) unit of measurement, the *sicilicus*, or one quarter of an inch. Heyman used the Parthenon to test his theories and concluded that the *scamilus* (6·84 mm) and the *sicilicus* (6·17 mm) were dimensionally similar.

The state of New South Wales in Australia has a considerable heritage of large-truss road bridges, many of them constructed in timber. In his paper, Rex Glencross-Grant traces the development of such bridges and cites examples of the various genres (Glencross-Grant, 2012). The author compares the construction rate of both timber truss and iron lattice girder bridges over the period 1850–1939, during which over 400 timber truss bridges were erected.

With increasing requirements in bridge design for sustainability and low maintenance costs, it is interesting to note the 'whole life' design, or sustainability, of the Type C (Allan) timber truss bridges. These timber trusses were designed in such a way that individual timber members could be replaced without having to support the bridge. Furthermore, it was possible to adjust the geometry of the bridge to overcome the effects of shrinkage in the timber members.

The final paper in this issue examines the career of the relatively unknown Russian-born engineer Vladimir Bodiansky (Frapier, 2012). It is now quite common for persons to have a number of career changes in their working life, but the circumstances that gave rise to Bodiansky's many-faceted career are not generally understood. When the time came for him to enter the building and construction industry in France as a consultant, he brought with him his experience of industrial and manufacturing techniques outside of the industry. He went on to collaborate with many of the most important architects of the second half of the twentieth century in France, including Charles-Édouard Jeanneret, better known as Le Corbusier.

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