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**Editorial**



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# Editorial

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Water has been an essential contributor to the development of agriculture, culture and civilisation worldwide, from Roman to ancient Egypt and Japan. Water helps a society to grow and prosper. It also requires good hydraulic infrastructures for transportation and distribution.

The August issue contains two papers on the infrastructure for water. The first paper introduces the history of the Shichika Canal (Japan), which can be traced back to the twelfth century (Nakagawa and Nakagawa, 2022). People in the Tedori alluvial fan of the Ishikawa Prefecture have benefited from the Shichika Canal since then. The Shichika Canal has seven channels; each year, the meltwater is discharged downstream without significant intake; lacking water during the summer often results in fights among the farmers. This did not change until the Edo era, when the water intake holes were built. In the Meiji era, a Dutch engineer was recruited, who helped to build the sewer systems, tunnel water channels and flood control. In the third stage of its development in 1962, the Shichika Canal was restructured. The development of the hydraulic infrastructure in Japan has had a significant influence on the surrounding countries; this paper is very interesting to read because we can learn the history of the Shichika Canal and the history of the development of hydraulic infrastructure in Japan.

The authors of the second paper considered Roman solutions as ‘green’; however, the effectiveness of these solutions when used in the current uncertain world remains unanswered. Therefore, the second paper by Margeta (2022) discusses reconstructing the two ancient Roman water intake facilities in Croatia and assessing the sustainability of water abstraction at the Jadro karst spring. The author used reliability, resilience, stability, energy use and environmental impact as criteria to evaluate the sustainability of the Roman water abstraction facilities. The paper put the solutions in the Roman period into the modern context and found that the solutions are technically sound and practical.

Considering the seismic risk of historical heritage in a conservation project is often prioritised because of the value of the buildings. Measures taken to prevent damage in a historic building often rely on the assessment results. This is what the third paper focuses on (Grant *et al*., 2022). Engineers often need to balance the practicability and accuracy of the analyses. This article comprises three case studies in the Netherlands and Italy using a more sophisticated approach: non-linear response history analysis. A multi-physics finite element programme was used to consider the dynamic behaviour of these three buildings. These projects also used a new material model developed for unreinforced masonry to enhance the efficiency of the analyses. Although the procedure used in this paper requires significant resources, it is not necessarily practical for all building conservation projects – this paper will be of interest to engineers who need to deal with earthquakes in their projects and academics who research earthquakes.

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