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Dams and Reservoirs

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Book review

A Sewer is the Best Medicine. Through plague, wars, famine and flood. Sir Robert Rawlinson and the nineteenth century public health revolution

J. A. Charles, Bannister Publications, Chesterfield, UK, 2022,
ISBN: 978-1-909813-77-9, £12.99, 299pp.

The title of the book comes from a poll conducted by the *British Medical Journal* in 2007, which voted clean water and sewage disposal the most important medical milestone since 1840.

The book is the biography of Sir Robert Rawlinson, a leading sanitation engineer in Victorian times. He was involved in sewerage schemes throughout the UK and abroad, but is less well known today than some of his contemporary engineers – possibly because much of the work he was involved in lies buried. However, he also took a major role following the infamous Dale Dyke dam failure, as he was appointed the government inspector to lead the public inquiry into that disaster.

The author, Dr Andrew Charles, worked at the Building Research Establishment (BRE) for 35 years, covering many aspects of ground engineering including the safety and long-term performance of old embankment dams. Having grown up in Rotherham, and then working on dam safety, he developed an early interest in Robert Rawlinson, and when he retired from his role as BRE technical director in 2002 he set about researching Rawlinson's life.

The author chose to write this biography as he felt that while there were biographies of others, such as Florence Nightingale, Lord Shaftesbury and Edwin Chadwick, who promoted the health of Victorian Britain, there was no complete record of the works of the engineer who worked with them and enabled many of their visions to be realised.

By the end of the nineteenth century Rawlinson was acknowledged as having led the revolution in public health engineering – from cesspits (if any) to flush toilets and sewerage systems in most towns and cities across the country. However, this had been a struggle between those who, with him, were trying to promote public health, and those who were opposed to extending the powers of the state by requiring councils to construct sewerage schemes. Many of the 18 chapters of the book show how Rawlinson was eventually instrumental, with others, in bringing sanitation – and consequent reductions in the death rate – to Britain and beyond.

Rawlinson was the civil engineer in the Sanitary Commission to the Crimean War in 1855, where men sick with disease outnumbered the wounded by more than ten to one, primarily due to insanitary conditions. His work, which vastly improved sanitary conditions in the hospitals, complemented the enhancements in nursing care led by Florence Nightingale, and so the death rate of patients – who had frequently died from diseases contracted in the hospitals – fell dramatically.

With the provision of clean water being a prerequisite for the flush toilets needed for the new sewerage systems, it is perhaps not surprising that Rawlinson was involved in a number of dam designs in Britain. He designed Lliw dam, which was under construction when Dale Dyke dam failed. Unfortunately, Lliw dam had ongoing leakage problems (until it was completely reconstructed in 1978), and these are covered by the author in some detail.

By 1864 Rawlinson was working as the chief engineering inspector for the Local Government Act Office on a salary of £1000 p.a., when the Dale Dyke disaster occurred. The author devotes a full chapter to describing the dam failure before introducing the role that Rawlinson had been asked to play – namely to lead a public inquiry into the disaster. The next two chapters cover the inquiry and the subsequent debate, as his report was not universally accepted, with many engineers engaged by the Sheffield Waterworks Company disagreeing with various conclusions of the report.

The jury at the inquest of a representative sample of those who died recommended that there should be a government inspection 'of all works of this character'. However, Rawlinson disagreed, recommending that the responsibility for reservoir safety should lie with the owners rather than the government.

The author has carried out a great deal of research for this biography and there is an extensive bibliography, including many nineteenth century documents. The book is well written and in detailing Rawlinson's life, shows how sanitation engineering in Victorian Britain led to a better quality of life for the general public. It also gives a fascinating insight into the disagreements on the cause of the Dale Dyke dam failure – matters that are still debated to this day.

The book would be an interesting read for all civil engineers, who would see how the role of the civil engineer has changed in the last 150 years or more, but would be particularly relevant to public health engineers and dam engineers.

Andrew Pepper