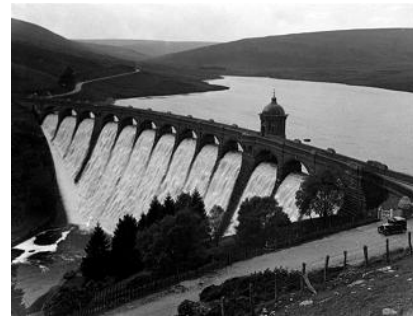


Planning for water supply: learning from historical approaches

Research is being undertaken at the University of Birmingham to identify the implications for future planning and design of an evaluation of historical approaches to uncertainty in water infrastructure provision, using the Elan water supply scheme for Birmingham, Lake Vyrnwy and Thirlmere as the study base. The aim is to determine whether Victorian approaches to uncertainty in water resources and supply planning offer any lessons or guidance for planning and designing water resources and supply schemes today, in terms of the processes, methods and parameters used.

Many remote upland reservoir and gravity aqueduct water supply schemes created in late Victorian Britain are still in use today. How has this happened? One of the largest and most controversial Victorian schemes is at Elan (pictured), which is located in mid-Wales and currently supplies 1 million people in Birmingham. The annual average demand forecast presented to Parliament by engineer James Mansergh in 1892 looked forward 63 years and was key evidence to justify the size of the scheme. Retrospectively, research has shown this forecast to be surprisingly accurate.



Is Elan typical? The research has drawn comparisons with two other Victorian reservoir schemes at Thirlmere, which supplies Manchester, and Lake Vyrnwy, supplying Liverpool. Mansergh's demand forecast for the full Elan scheme has been confirmed as the least risk averse, largely because he understood the major components of demand. The demand forecast for Manchester, developed by the eminent engineer, John Bateman, is based on linear extrapolation of total demand, and is the most risk averse. Allowances for uncertainty are not explicit in these forecasts, and published information rarely contains sensitivity analysis. Experienced engineers were expected to provide "the forecast" to their client Corporations, and to Parliament.

Today, Thames Water is proposing a new Upper Thames Reservoir near Abingdon for meeting London's demands. The company's demand and supply forecasts are sensitivity tested to assess ranges of uncertainty, and the results are to be compared with the Victorian schemes. The major uncertainty issues now are of future environmental water requirements and the impacts of climate change. The existence of so much more data, and ever more sophisticated models, not only leads to better understanding, but also increases the risk of "paralysis by analysis". Our Victorian forebears would be both impressed and horrified.

For further information please contact [Dr John Bridgeman](#).

The picture above is of Craig Goch dam, one of five that make up the Elan water supply scheme, photographed in the early 1930s.