Thomas Hawksley

The Man, The Projects, The Legacy

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LIFE & TIMES OF THOMAS HAWKSLEY

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THOMAS HAWKSLEY 1807-1893

… a pioneering water, drainage, and gas engineer of the nineteenth century.

IT ALL STARTED IN NOTTINGHAM

The son of John Hawksley and Sarah Thompson born in 1807 at Arnot Hill House in Arnold, near Nottingham.

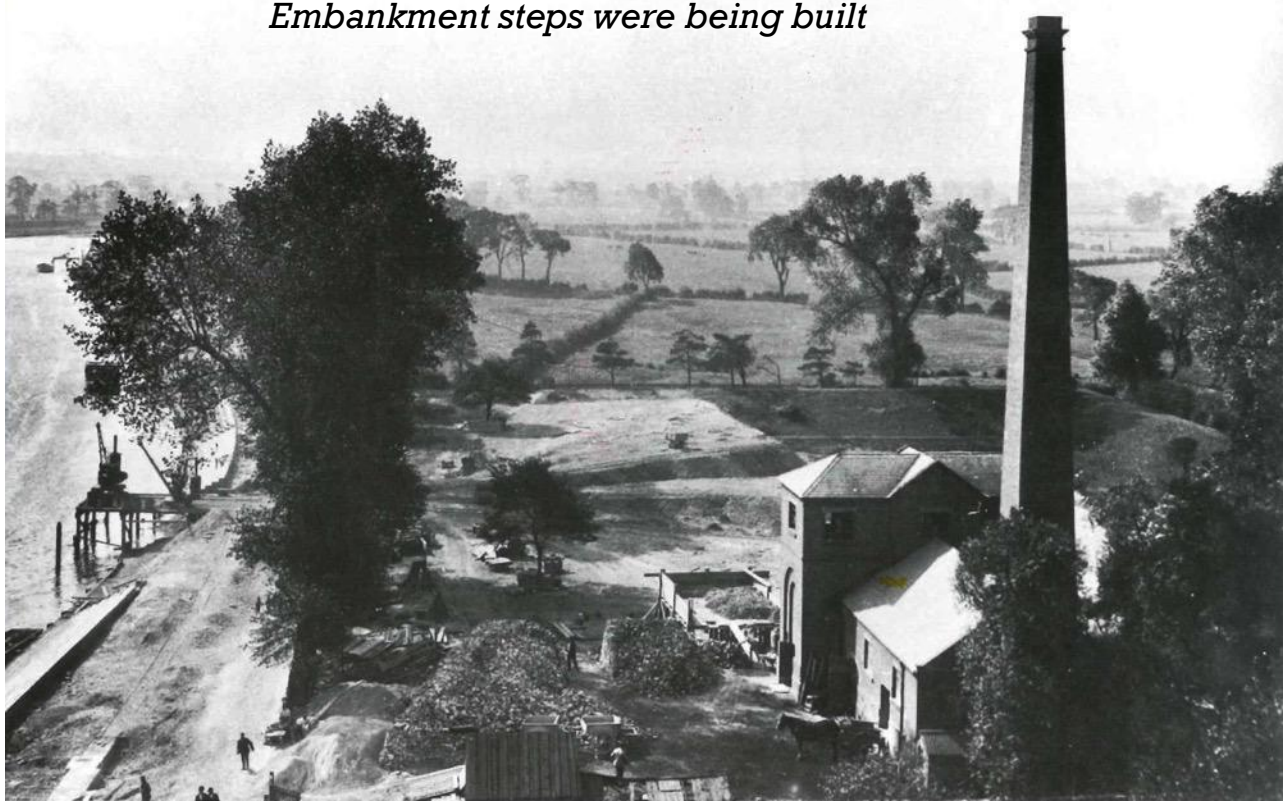
Hawksley was largely self-taught from the age of 15 onwards, and at the age of 23 he was appointed as Engineer to the Trent Water Company and built its first works near Trent Bridge (1831). This scheme delivered Britain's first high pressure 'constant water supply', preventing contamination entering the supply of clean water mains.

He was engineer to the Nottingham Gas Light and Coke Company and Nottingham Waterworks Company for more than half a century

TRENT WATER WORKS

A brilliant ground breaking engineering achievement. Water was not pumped from the River Trent but drained from the ground using the sands and gravels around the river as a filter. His major achievement was to ensure that the pipes that distributed the water to the town were kept constantly under pressure so that water could be drawn from the taps day or night and contamination was kept out. This we take for granted now but earlier systems provided water only for an hour or two a day to avoid waste caused from leakage. Hawksley redesigned the taps, valves and pipe work eliminating the leakage and achieving the availability of a constant supply of water. He improved standards of public health so dramatically that Nottingham escaped the 1848 cholera outbreak.

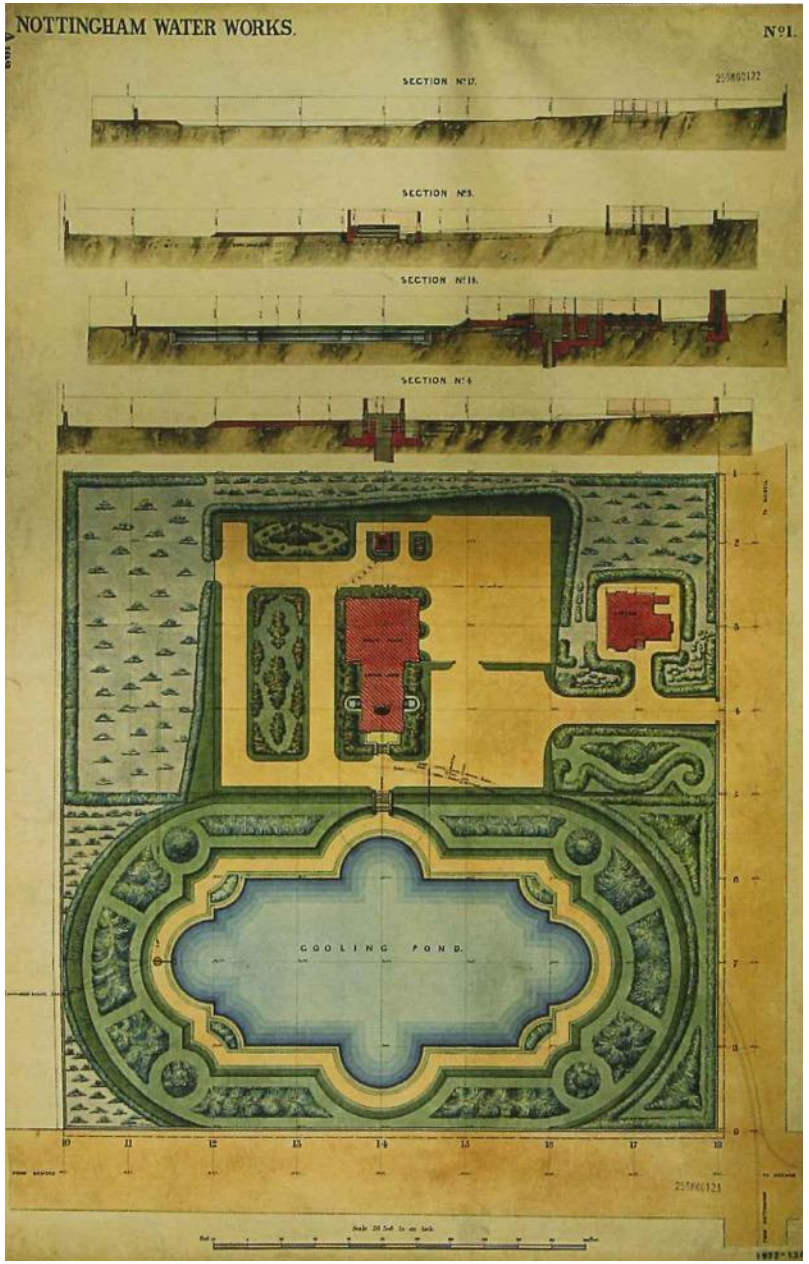
Trent Works 1896 when the Victoria Embankment steps were being built



NOTTINGHAM WATER COMPANY

Formed in 1845 from three existing companies, Hawksley was appointed as Engineer. He built the Park Works in 1850 sinking a 7 feet (2.1metre) diameter borehole 250 feet (76 metres) deep into the bunter sandstone aquifer on which much of the Nottingham area sits which provides a pure and reliable source of water

The Park Works on The Ropewalk Nottingham



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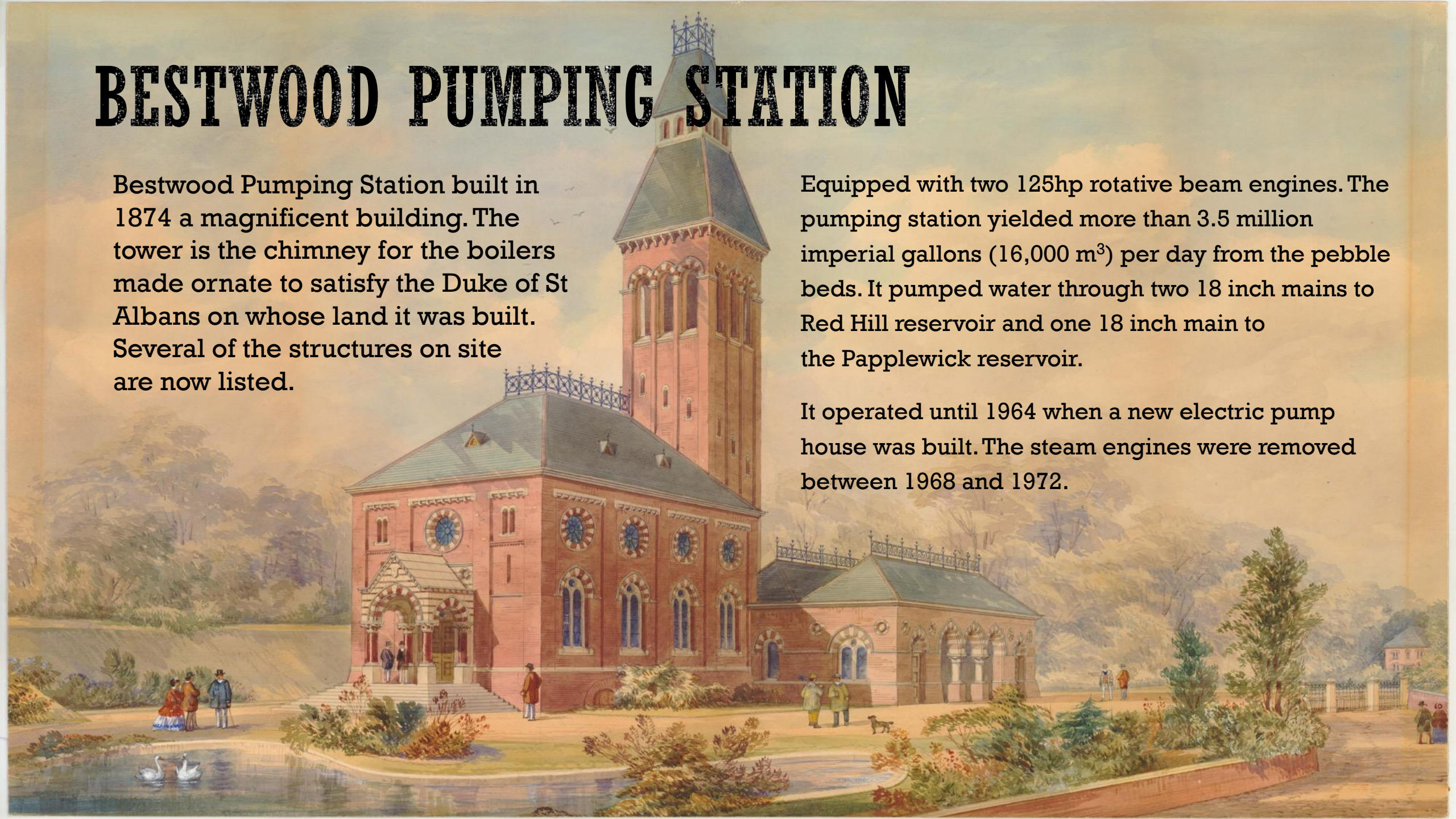
BESTWOOD PUMPING STATION

Bestwood Pumping Station built in 1874 a magnificent building. The tower is the chimney for the boilers made ornate to satisfy the Duke of St Albans on whose land it was built. Several of the structures on site are now listed.



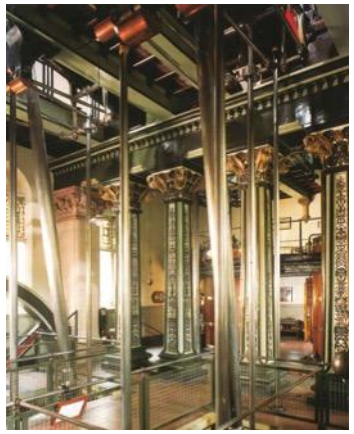
Equipped with two 125hp rotative beam engines. The pumping station yielded more than 3.5 million imperial gallons (16,000 m^3) per day from the pebble beds. It pumped water through two 18 inch mains to Red Hill reservoir and one 18 inch main to the Papplewick reservoir.

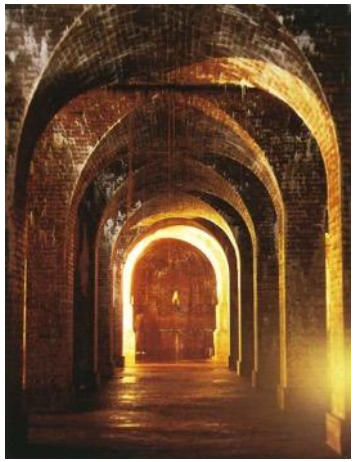
It operated until 1964 when a new electric pump house was built. The steam engines were removed between 1968 and 1972.

PAPPLEWICK PUMPING STATION

Hawksley did much of the planning work and design for the Papplewick pumping station.

Built by Nottingham Corporation Water Department between 1881 and 1884 to pump water from the Bunter sandstone to provide drinking water to the City of Nottingham, in England. Two beam engines, supplied with steam by six Lancashire boilers, Apart from changes to the boiler grates, the equipment remained in its original form until the station was decommissioned in 1969, when it was replaced by four submersible electric pumps.





Papplewick Pumping Station

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GAS ENGINEER

Hawksley was not only a civil and mechanical engineer but was a gas engineer, building Basford, Eastcroft and Radford Gasworks in Nottingham.

During the Chartists Riots 1840 an attempt was made to seize the gas works to put Nottingham into darkness. Hawksley defended the works by organising his small number of staff, barricaded the entrance, coupled up pipes and connected them to the gas supply.

He also went on to design and build gasworks for many towns and cities across Britain.

19th Century Nottingham

HE BECAME TRULY NATIONAL AND INTERNATIONAL

Acclaimed for his constant water supply system, he went on to design and supervise 150 water supply schemes for major cities and towns in Britain, including:

- The cities of Nottingham, Sheffield, Liverpool, Sunderland, Derby, Leicester, Cambridge, Norwich

And countries like Sweden, Poland, Denmark, Germany, Austria, India, and Barbados in the West Indies, including:

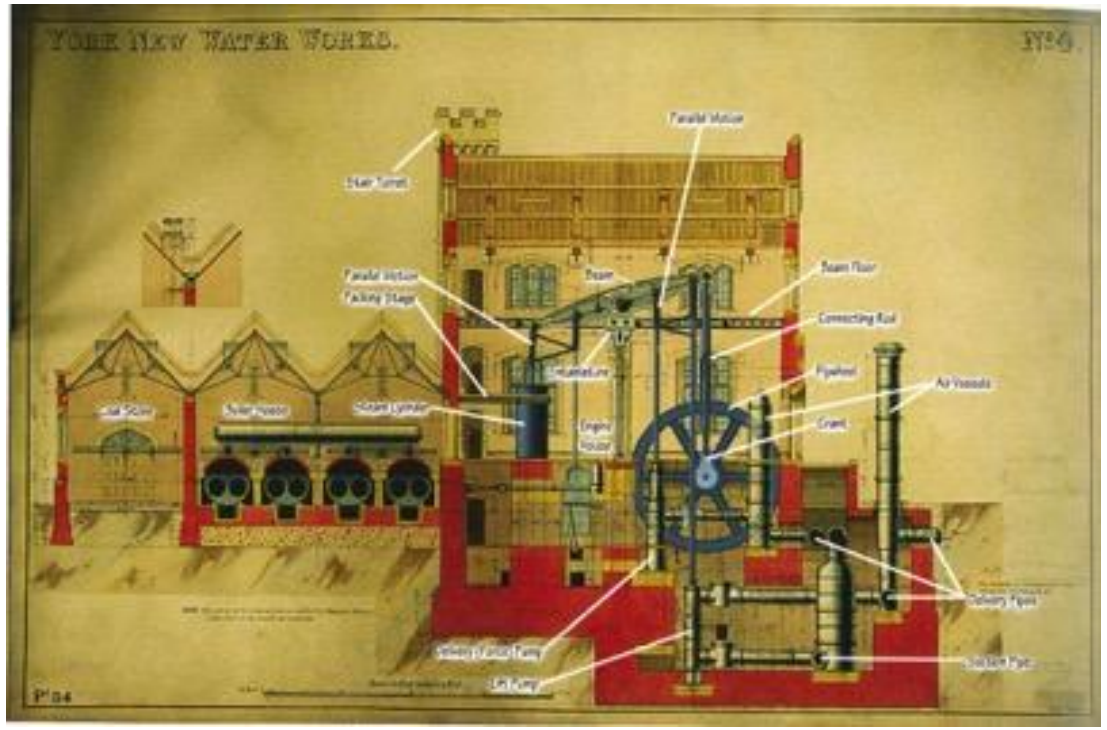
- The cities of Vienna, Stockholm, Mumbai, Hamburg, and Warsaw

SCHEME DEVELOPERS AND DEBATE, PRIVATE COMPANIES, CORPORATIONS AND COUNCILS

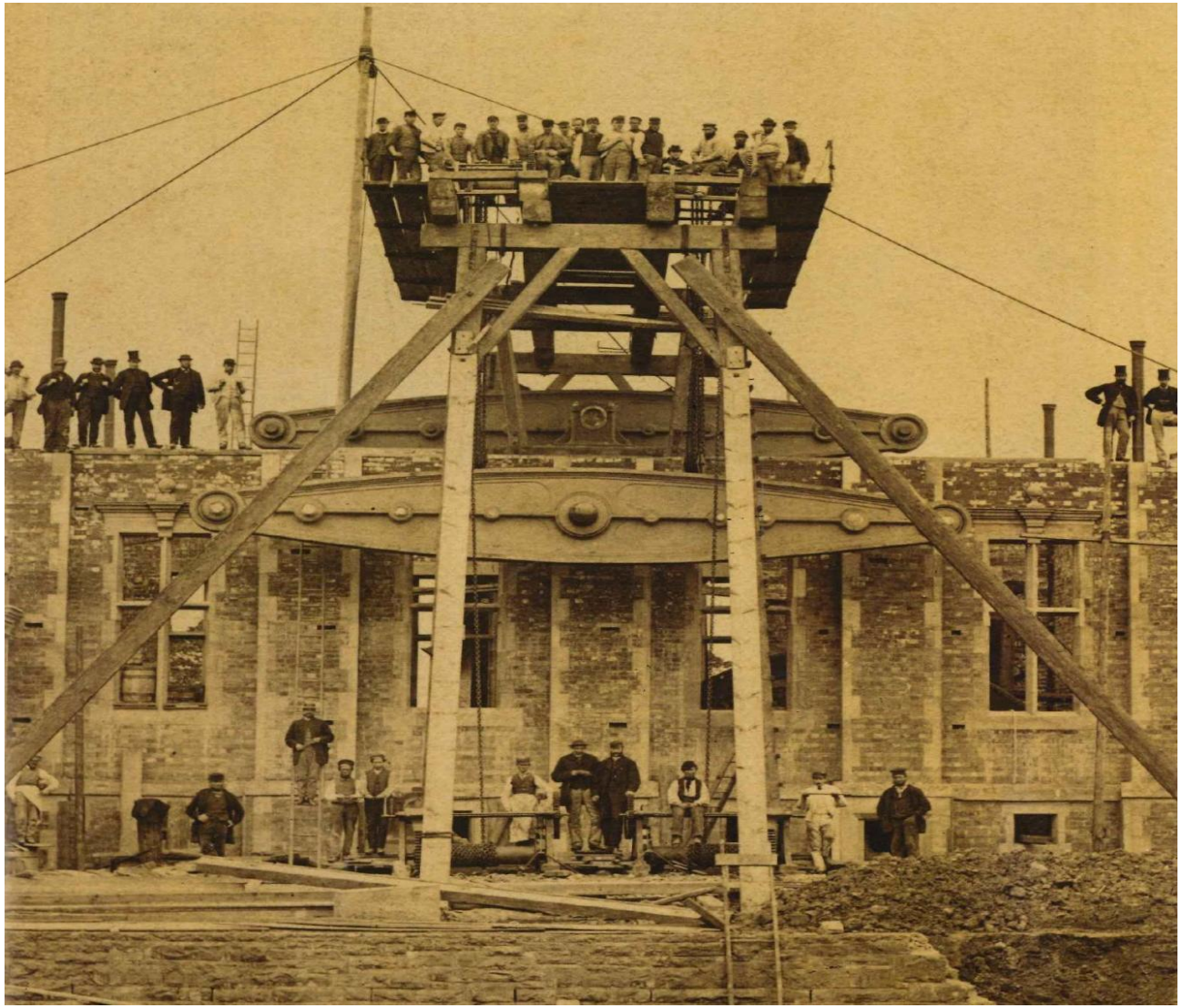
As populations grew and the industrial revolution gathered momentum, Thomas Hawksley designed and built new water supply systems for many cities and towns across Britain. These water supply systems included dams, boreholes, intakes, aqueducts, pipelines, pumping stations, waterworks, reservoirs, mains, distribution systems, and plumbing.

He was a big proponent of the pumped system, rather than gravitational, but always aimed to assess and propose the best scheme for the situation.

He also undertook major schemes in main drainage and gasworks.



EXAMPLE: SUNDERLAND



Ryhope pumping station, Sunderland, in construction, showing the massive timber "shear legs" and "crab" required to lift the major components into place.

Not the same Health and Safety Standards of today.

EXAMPLE: LIVERPOOL

For the Liverpool Corporation he undertook the major Rivington Pike Scheme and designed the Vyrnwy Dam and aqueduct. Both are still in use today.

Vyrnwy Dam

EXAMPLE: INTERNATIONAL

Very limited details of Hawksley's international work but he was recognised and honoured for his work:

- Commander of the order of Franz Josef of Austria (for his work for the city of Vienna)
- Commander of the Rose of Brazil (for his advisory services to cities in Brazil)
- Member of the Swedish order of the Polar Star (for his work for the city of Stockholm)
- Knight of the Dannebrog (for his work on schemes in Denmark)

THOMAS HAWKSLEY 1807-1893

He became:

- The first President of the Institution of Gas Engineers.
- The President of the Institution of Civil Engineers.
- The President of the Institution of Mechanical Engineers.
- A Fellow of the Royal Society.

MWH WATER SUPPLY AND PIPELINES TODAY

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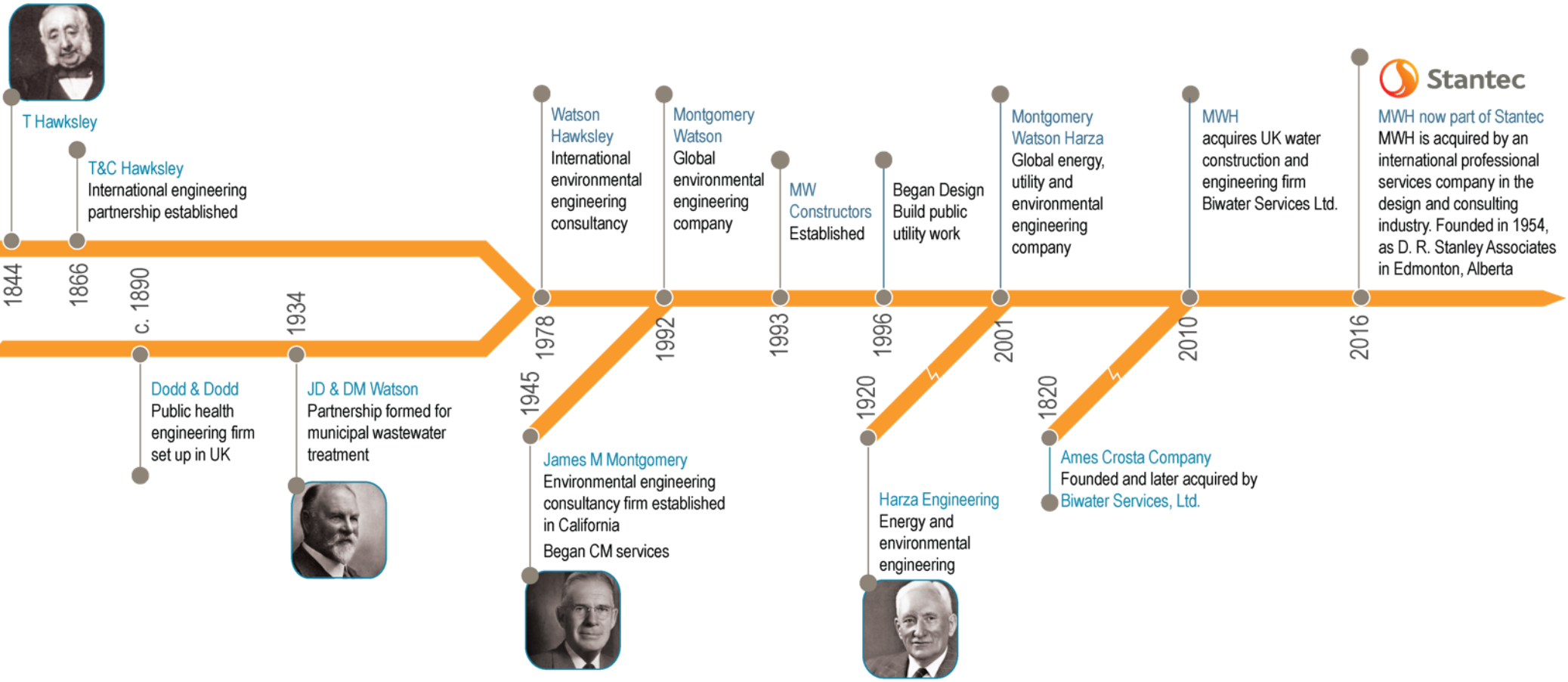
TIMELINE



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MWH PIPELINES

Our services focus on the core areas of water and wastewater infrastructure, including pipelines, pumping stations, treatment works, canals and reservoirs.

Today we continue the Hawksley tradition and are recognised for pipeline planning, design and construction.

UK:
VYRNWY CONDITION ASSESSMENT

- A 10 year programme of refurbishment is being undertaken on the Vyrnwy Large Diameter Trunk Main with completion scheduled for 2020.
- Several condition assessment studies on various sections of the pipelines have been undertaken in recent years. The results of these investigations returned varying estimates of remaining life, ranging from zero to more than 100 years.
- The MWH Pipeline Engineering team was given the task to understand the very different remaining life assessments given and develop a new procedure for the condition assessment of large diameter cast iron pipelines.

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LAS VEGAS PIPELINE

Built in the 1930s, Lake Mead sits behind the Hoover Dam, providing a municipal water supply to Nevada, Arizona, and California. Due to drought and a steeply rising population over the past decade, water levels have dropped dramatically.

New pipelines including a dredged trench within the lake.

Designing a large-scale dredging and pipeline installation project for a lake brings with it its own challenges.

“Preparing for a project of this size on a land-locked body of water means you can’t just summon a dredger or pipeline barge,” “So we’ve had to design the pipeline knowing that any equipment, plant or materials will need to be transported by land.

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ABBERTON

- To meet water resource requirements in the future, Essex & Suffolk Water implemented a scheme to increase the storage capacity at their existing reservoir at Abberton, from 26 to 41 billion litres of water.
- Storage capacity was increased by raising the reservoir top water level by 3.2m to provide an additional 15,000Ml of raw water storage, an increase of 58%. The infrastructure improvements around the reservoir include a replacement off-take pumping station, re-engineered valve tower, pipelines and discharge channels.
- The earth filled, clay core design took into account the fact that the largest recorded earthquake in the UK was centered just a few miles from the dam.
- Winners of Sustainability Award at the Constructing Excellence National 2015 Awards.

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5,000+

Oil & Gas projects across
North America in 2016

Stantec

Oil and Gas Pipeline Engineering

- Route selection, environmental assessment, permitting
- Hydraulic simulations
- Cost estimation
- Stress analysis
- Mechanical design
- Detailed design of wall alignment – wall thickness, buoyancy control, bending, etc)
- Pipeline Facilities and Assemblies
- Material Selection
- Welding/Joining Design
- Field Engineering
- Full Drafting and Design
- Regulatory Support

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TransCanada Energy East Project

- 4,400 km
- Alberta to Eastern Canada
- Front end engineering and design (FEED) for the pipelines and facilities portion

Stantec

Keystone Pipeline Project

- 3,460 km
- 36 inch
- Assessment, Permitting and Compliance
- Construction Management
- Engineering
- Environmental Services
- Oil & Gas EPCM Services

Stantec

BOARDWALK FIELD SERVICES

THE STATE OF TEXAS, UNITED STATES

Gathering the Right Experience

- Boardwalk Field Services, a midstream, full-service gas company, was ready to expand. They already had a gathering system in South Texas, but the nearby Eagle Ford development was a great opportunity to take another big step forward. That step forward was 64 miles of pipe.
- Our experience with oil and gas. One of our biggest challenges was finding a way to get 1,200 feet of 30-inch diameter pipe safely across the Guadalupe River in a confined area. But, with extensive calculations and a proven horizontal directional drill solution, we met that challenge too. This project was permitted, approved, designed, and underway in just seven short months.

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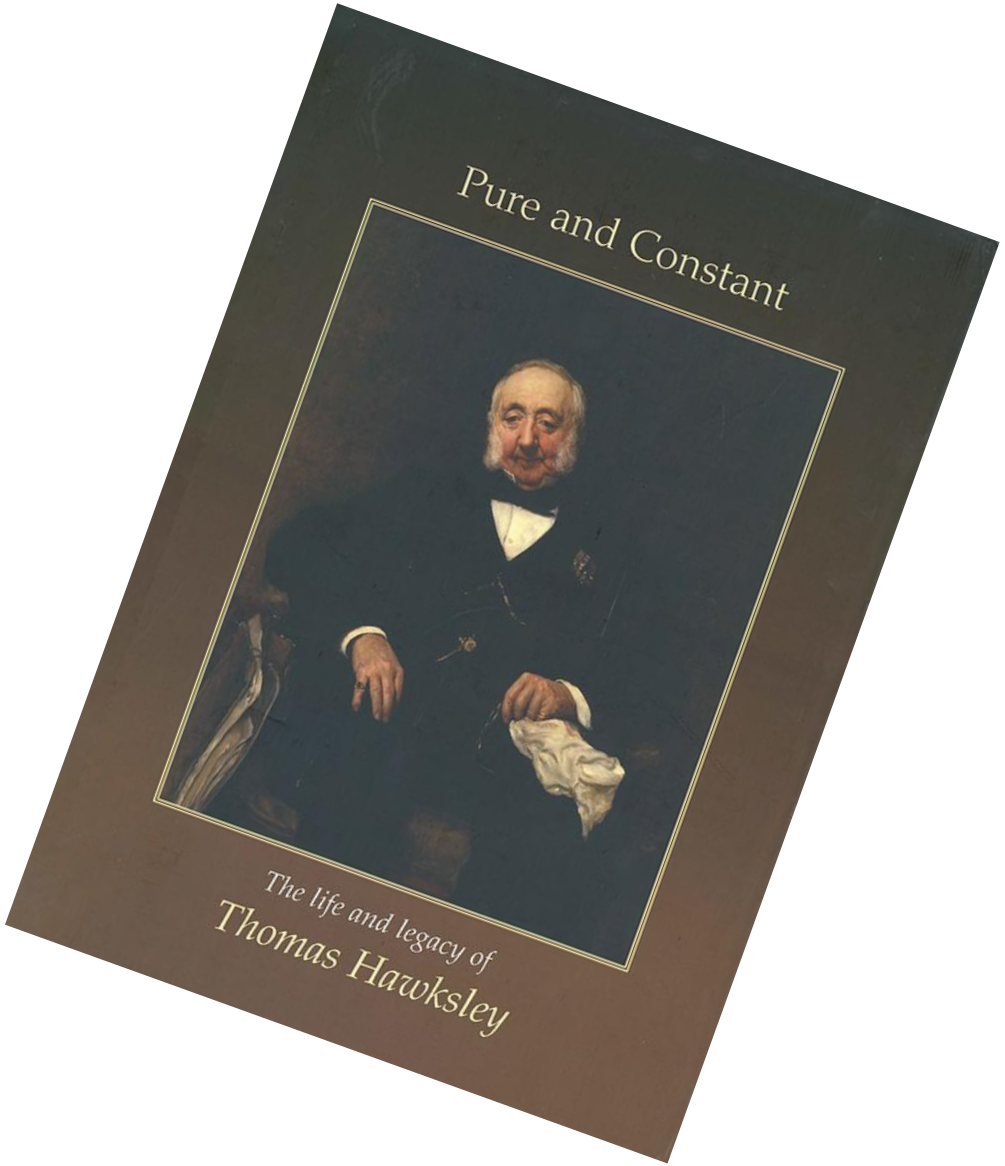
PURE AND CONSTANT



'There is scarcely a large city in the kingdom which did not make use of Hawksley's services at one time or another',

The Dictionary of National Biography.

'By his Genius, strict Integrity, and Hard Work up to his 87th year, he earned for himself the highest reputation both at Home and Abroad',

Plaque to the memory of Thomas Hawksley, Nottingham.