Joseph Bazalgette, the chief architect of underground London, joined the Metropolitan Commission of Sewers in 1847, becoming engineer-in-chief. He was knighted in 1875 and elected President of the Institute of Civil Engineers in 1884.

LONDON’S SEWERS

Work on the northern outfall sewer running across Plaistow and East Ham Marshes to Beckton, started 1861 (London page 74)

Construction of the Crossness sewage treatment works at Crossness, at the confluence of the Thames and Barking Creek (London page 73)
Abbey Mills pumping station in Venetian Gothic style (London page 74)

Becton under construction 1865 (London page 76)
The tunnels at Wick Lane near Old Ford (London page 77)

The Crossness Works at Becton (London page 79)
Common Materials used in Water Supply Systems

LEAD, TERRACOTTA AND BRONZE were already in use by the time of the Romans' great engineering feats. These are the most common materials used in water supply systems down the ages.

- **Romans**: Ducts of stone, open ducts of masonry; fittings of bronze; pipes of stone, terracotta, wood, leather and lead.
- **France, seventeenth century**: Cast iron pipes were used to supply Versailles; they were joined by bolted flanges.
- **London, seventeenth and eighteenth centuries**: The New River Company used bored elm logs with spigot-and-socket joints, the smaller tapered end being coated with white lead and driven into the larger end that was reinforced with a larger band. In 1765 the London Bridge Waterworks Company laid more than 49,000m of wooden pipe, 3,500m of lead and only 1,650m of cast iron. Thomas Simpson designed the first ball-and-socket and lead joints in 1785.
- **United States, mid-nineteenth century onwards**: Wooden pipes banded with iron, steel or bronze spiralled around it; pine planks; later cast iron. In 1848 Dr Robert Angus Smith, an Englishman, patented an effective exterior coating against corrosion, combining gars tar, pitch, linseed oil and lead. Wrought iron and steel, especially for larger diameters and lengths, became more common into the twentieth century, not least due to its lightness and ease of handling.
- **United States and Spain, twentieth century**: Reinforced concrete became popular for larger diameter mains.
- **Large PIPES have also been made in cement asbestos (from 1915), lead, copper, fibrous compounds and plastics.**

*(Well Washed & Watered, Charles Knevitt, Institute of Plumbing, 1998)*
“Work” painted by Ford Madox Brown 1863
Labourers working on the sewers in Hampstead