Historic England

Education

Teacher's Kit

Industrial Heritage - Utilities - Gas

A History of the Gas Industry

Lighting up the Nation

The development of gas lighting in the nineteenth century had a dramatic impact on the domestic and working lives of the people of Britain. Gas lighting was a far more efficient and economic form of lighting than oil lighting that preceded it. Subsequently gas was used for other purposes such as cooking and heating.

The ability to derive gas by the heating of coal was discovered in the seventeenth century. The Scottish engineer, William Murdoch, was the first person to demonstrate the practical application of this discovery when, in 1792, he lit his house in Redruth, Cornwall, using gas produced in an iron retort. The first buildings to be lit by gas were a number of textile mills in northern England, around 1806.

Early gas works were small, private concerns built at factories, mines, railway stations, and country houses. The world's first public gas works opened in Great Peter Street, London in 1813. By 1826 almost every city and large town in Britain had a gas works, primarily for lighting the streets. In these towns, public buildings, shops and larger houses generally had gas lighting but it was not until the last quarter of the nineteenth century that most working people could afford to light their homes with gas.

The gas industry in Britain was nationalised in 1948 and then privatised in 1986. Natural gas replaced coal gas in the 1960s and 70s. Gas has become a major world-wide industry and now provides over 40% of the United Kingdom's energy.

Gas manufacture

The process of manufacturing gas from coal remained unchanged from the early days of the industry in the seventeenth and eighteenth centuries to the point when production ceased in the 1970s.

1 Coal was heated in enclosed horizontal vessels known as retorts and the gas given off. (Coke – a valuable by-product, was left in the retorts after the coal was heated, other products have caused severe environmental contamination at many former gas works).

2 A mixture of hydrogen, methane and carbon monoxide was passed through a condenser to remove tar (also a valuable by-product).

3 The gas was then passed through one or more purifiers to remove any further impurities.

4 The gas works then passed the gas into one or more gas holders (often mistakenly called 'gasometers').

Buildings of the gas industry

Early gas works needed a supply of coal and a means of transporting away waste products. Many were located near navigable rivers and canals. Later works were typically sited alongside their own railway sidings. Gas is lighter than air and rises with altitude, so it was necessary to site gas works at the lowest point in an area.

Industrial Heritage - Utilities - Gas

The key structures of all gas works were:

- Retort house(s): The area of the retort house containing the retorts varied in accordance with the size of the gas works Retort houses generally had ventilated roofs with raised sections, although these were often replaced if the building was adapted for later use.
- Purifier house: Generally smaller than the retort house and located alongside it, this building housed the equipment and (often) the chemicals used in the purification process.
- Coal store: Wet coal impaired the efficiency of the gas production process so it was usual to store it in a covered shed.
- Gas holder(s): Closed cylindrical vessels have been used for the storage of gas almost from the birth of the industry. Gas holders were made of wrought iron (later steel), supported above a tank of water by the pressure of the gas within. Early examples were usually sited underground but by the mid-nineteenth century, telescopic gas holders, which became a familiar feature of the urban landscape, were in use. Many of these gas holders are still in daily use by the British gas industry and a number of the more historically important examples have listed status.

Health, safety and contaminants in the early gas industry

Working in the gas industry was hard and often dangerous work. The retorts had to be filled or 'charged' with coal by hand which was hard, back-breaking work. Although larger gas works introduced mechanical charging and vertical or inclined retorts from the late-nineteenth century, hand charging continued at smaller gas works until the 1960s.

The waste products produced by the gas industry such as coal tar, foul lime and spent oxide contaminated the sites of former gas works. Public concern about the level of pollution and the quality of the gas culminated in a raft of legislation which sought to regulate the financial accountability and environmental impact of Victorian gas companies.

Cooking with gas

London's Reform Club was the first kitchen to install gas cookers in 1841, however the use of gas for cooking purposes was slow to gain acceptance. Gas cookers were amongst the modern innovations on display at the Great Exhibition of 1851 which increased their popularity amongst wealthier households. The use of gas cookers became widespread with the introduction of rental schemes, paid for with gas pre-payment meters. The invention of the oven thermostat in 1923 revolutionised domestic cookery and further popularised the gas cooker.

Heating and hot water

Coal remained the preferred method of heating homes well into the twentieth century. The development of gas heating systems was very slow. By 1905, the introduction of ceramic radiant fires made gas heating an option for many homes and improvements in the 1950s led to convector fires. The passing of the Clean Air Act in 1956 which restricted the use of solid fuel in urban areas saw a huge increase in the popularity of gas fires and central heating.

Early attempts at using gas to heat water involved using gas jets to heat a metal bath and the water inside. Later in the nineteenth century gas geysers were mounted directly (and dangerously!) above the sink or bath. In the twentieth century gas water heaters with flues and ignition from a pilot light made heating hot water safe and efficient.

Industrial Heritage - Utilities - Gas

Key Sites

A complete small town gas works dating largely from the nineteenth century has been preserved at Fakenham, Norfolk. (fakenhamgasmuseum.com/about-the-museum/) Other similar examples exist at Biggar in Lanarkshire, Scotland (historicenvironment.scot/visit-a-place/places/biggar-gasworks-museum/) and Carrickfergus in County Antrim, Northern Ireland (flamegasworks.co.uk/concrete/). These are all open to the public, however, given the large numbers of gas works in towns and cities in the past, remarkably few now survive.

Other examples can be found at:

National Gas Museum at Leicester includes the surviving buildings of Leicester's Aylestone Road gas works and an important collection of gas artefacts. (nationalgasmuseum.org.uk/)

Holkham Hall, Norfolk – gas house. (holkham.co.uk/)

Culzean Castle, Ayrshire – gas house. Information and images from the Scotish Archives can be found here: (scotlandsplaces.gov.uk/record/rcahms/121401/culzean-castle-gas-house/rcahms?item=763963).
A good article about the Culzean Castle Small Gas Making Plant can be found on the "Heritage Group" website of the Chartered Institution of Building Services Engineers. (hevac-heritage.org/items_of_interest/gas_making/gas_making.htm)

The following places have gas related buildings or objects, but they may not be mentioned on their web sites:

Coldharbour Mill, Uffculme, Devon – retort house. (coldharbourmill.org.uk/) However a photograph and information about the retort house can be found here: (historicengland.org.uk/services-skills/education/educational-images/gas-retort-house-at-coldharbour-mill-uffculme-11225).

Quarry Bank Mill, Styal, Cheshire – retort house and gas holder tank. (nationaltrust.org.uk/quarry-bank)

Wimpole Hall, Cambridgeshire – retort and purifier house. (nationaltrust.org.uk/wimpole-estate)

Mount Stewart, County Down – remains of gas house with retorts. (nationaltrust.org.uk/mount-stewart)

Sources

Gledhill, D. (1999) *Gas Lighting* (Shire).

Palmer, M, Nevell, M, Sissons, M. (2012) *Industrial Archaeology: A Handbook*, Council for British Archaeology Practical Handbooks.

Dr Russell Thomas, (Parsons Brinckerhoff) *Country House Gasworks. A profile of the sites, the processes undertaken and type of contaminants present.* (eugris.info/newsdownloads/CountryHouseGasworks.pdf) This document has good descriptions and illustrations about how the pieces of equipment were used in a small domestic gasworks.

A History of the Electricity Industry

Background

Michael Faraday's discovery of the principles behind the dynamo in 1831 enabled mechanical power to be converted into electricity. Telegraph systems and outdoor lighting using arc lights provided the first practical use of electricity which was usually generated by dynamos powered by steam engines.

With the invention of the incandescent light bulb around 1880 by Swan in Britain and Edison in the USA, electric power soon became more popular than gas for indoor lighting. The world's first electric street lighting was installed in Goldalming in Surrey in 1881.

The electric motor, which developed alongside the dynamo, provided compact and easily controlled mechanical power for industry and transport.

Direct current (DC)

Most early electricity generating stations provided direct current, which was stored in accumulators to provide power when generators weren't running. Direct current could only be supplied over short distances which meant that generating plants were often municipally owned and situated in large urban centres where they supplied electricity for tram systems, street lighting and industrial and domestic use. Many large country houses, factories, mines, railway and tram companies installed their own electricity generation plants.

Alternating current (AC)

By utilising transformers to increase and decrease the voltage, alternating current allowed electricity to be transmitted over much greater distances. It was not until the first national grid was created in the 1920s that AC supplanted DC. After World War Two power generation was consolidated into fewer larger stations.

The electricity industry was nationalised in 1948, with the creation of the Central Electricity Generating Board. The industry returned to the private sector in 1990.

Electricity generation

Some early electricity generating plants used water turbines to drive the dynamos and often used the infrastructure of existing water mills. Horizontal steam engines were often used where water was unavailable with oil and gas engines favoured for small generating stations. The steam turbine, invented in 1884 proved to be the most effective power source for producing the high shaft speeds required for the alternators. Steam turbo-alternators remain the main power generators to this day.

Steam production

Steam was mostly produced in coal-fired boilers, although oil, gas and refuse were also used as fuels in locations away from coalfields. The world's first commercial power station to use a nuclear reactor to generate the steam for its turbines

was opened at Calder Hall in Cumbria (now part of the Sellafield Complex) in 1956.
Calder Hall has now been decommissioned, but other nuclear power stations remain in use in Britain.

In 2016 the UK govenrnment signed a contract with a French and Chinese consortium to build a new generation of Nuclear Power Stations in this country, the first of which is to be Hinkley Point C in Somerset.

Renewable Energy production

Large hydro-electric power stations were built in areas such as Scotland, Wales and Ireland from the 1920s onwards and many of these remain in use today.

Wind, wave and solar power are also gaining a larger share of energy production in the UK and during April to September 2016, about 10% more energy was generated by solar power than by coal during that same six month period.

Buildings of the early electricity industry

Small early electricity generating stations were often located in existing buildings, but larger private plants were generally housed in purpose-designed buildings, usually with four separate areas:

- A boiler or gas generator house.
- A 'power hall' for engines and dynamos.
- A battery room, which needed to be well ventilated to prevent the build-up of hydrogen.
- Railway sidings and coal storage area.

Early public generating systems although larger, followed a similar pattern, and were usually located close to an urban centre.

AC generation buildings

The move to AC generation meant that battery rooms were no longer required. As the size of electricity generating stations grew they moved to the edges of towns and, after the construction of the National Grid, to locations far away from urban centres.

The steam generated by steam-driven power stations must be cooled, thus power stations are often sited at coastal or estuarial locations where they have access to large amounts of cooling water. Elsewhere cooling ponds or towers are used. Early, rectangular cooling towers were replaced in the 1920s by the hyperbolic design still used today.

Transformers (sub-stations) were originally housed in buildings or kiosks but most are now in open enclosures.
The development of the National Grid from the late 1920s created the most visible evidence of the electricity industry as large pylons spread across the countryside. Interestingly, there is currently a project to remove some of the pylons and bury their cables, in places where they are at their most visually obtrusive in National Parks and Areas of Outstanding Natural Beauty.

Industrial Heritage - Utilities - Electricity

Key Sites

Cragside, Northumberland – this National Trust property is believed to be the first house in the world to be lit by electric bulbs. (nationaltrust.org.uk/cragside)

Tate Modern, London – the former Bankside Power Station, built in 1947 by Sir Giles Gilbert Scott, a rare example of adaptive reuse of a large, late power station and is now a modern art gallery. In 2013 it was number four in a list of the most visited tourist attractions in the United Kingdom.

Battersea Power Station, London – also designed by Sir Giles Gilbert Scott, this iconic building was begun in the 1930s with a second phase operational by 1944 and the building completed in 1955 with the addition of the last chimney. Electricity production ended in 1983. A scheme to reuse the grade II* listed building is currently in progress, which will contain retail, leisure, offices and new homes and is due for completion in 2020.

The working Fiddlers Ferry Power Station at Warrington. The link below contains educational resources and details about educational visits. (sse.com/beingresponsible/responsiblecommunitymember/educationresources/)

Sources

Palmer, M, Nevell, M, Sissons, M. (2012) *Industrial Archaeology: A Handbook*, Council for British Archaeology Practical Handbooks.

A History of Public Water Supply & Sewage Disposal

Background

The earliest piped water systems in Britain were built by the Romans. In the medieval period, monks used leats, pipes and conduits for use in their monasteries.

During the Industrial Revolution water sources became increasingly polluted, leading to diseases such as cholera and typhoid. The Westminster doctor, John Snow, established the link between cholera and foul water in 1850. The scale of the problem was recognised by social reformer Edwin Chadwick, whose report on The Sanitary Condition of the Labouring Population (1842) contributed to the creation of a regulatory framework governing public health. The 1875 Public Health Act empowered local authorities to provide clean water supplies and to collect and treat sewage before its disposal.

In upland areas, natural lakes were enlarged and new reservoirs created by the construction of dams across valleys. Clean water was extracted from source, stored, treated and stored again before delivery to the customer. The Victorian water supply system consequently evolved as a network of structures spreading out across a large area. Although gravity was used where possible there was a need for pumping between most stages.

Waterworks

A waterworks is a site comprising a number of component parts and may consist of:

- Pumping stations
- Open or service reservoirs
- Filter houses
- Staff houses
- Offices
- Laboratories

Water pumping stations

During the nineteenth century the architectural style of water company buildings was used to express the purity, safety and reliability of their water supply. Many towns in Britain still retain elaborately embellished water towers and pumping stations, often in a high gothic style.

Nineteenth and early-twentieth century pumping stations were powered by large steam engines, and many of these remained in operation until the 1960s and early 1970s. High buildings were required to house the beam engines and to provide light and ventilation.

Pumping stations can be identified by the presence of:

- High buildings with tall, round-headed (and other types of) windows.
- The presence of other structures including housing for staff, boiler houses and chimneys.
- Presence or evidence of pumping engines and gantry (maintenance) cranes.

Water storage

Water ready for treatment or delivery to the customer was stored in open reservoirs, service reservoirs (elaborate, underground structures, covered to give the impression of a grassed field) or water towers (placed at a high point within the area to provide the necessary pressure to move the water by gravity).

Cast-iron tank water towers first appeared in the 1820s. The site of the water tower often contained a working area, pumps, access to the tank and accommodation for the engine-man.

Sewage treatment

As water supplies improved and the flushing water-closet gained in popularity the need to safely dispose of sewage became a primary concern. An Act passed after the infamous 'Great Stink' of 1858, enabled the construction of London's sewage system which was engineered by Sir Joseph Bazalgette. From the mid-nineteenth century onwards, most of the larger cities in the country began to construct sewage systems and pumping stations to assist the flow of effluent. Although most major cities had sewage systems by 1900, sewage treatment works were slow to develop (the majority of the basic treatment processes were in place by 1914).

Sewage treatment works usually consist of:

- Settling beds
- Filter beds
- Pumping stations
- Reservoirs
- Staff houses
- Offices
- Laboratories

Industrial Heritage - Utilities - Water & Sewage

Key sites

Significant numbers of historic waterworks and pumping station buildings survive, some with their original equipment and steam engines. The following selected list of sites are all open to the public:

Ryhope Engines Museum – two 1868 beam engines in the Sunderland Waterworks. (ryhopeengines.org.uk/)

Papplewick Pumping Station – two James Watt beam engines at the Nottingham Waterworks. (papplewickpumpingstation.co.uk/)

Hereford Waterworks Museum – traces the history of water supply. Includes working triple-expansion steam engines. (waterworksmuseum.org.uk/)

Kew Bridge Steam Museum – tells the story of London's water supply from Roman times. (waterandsteam.org.uk/)

Blagdon Pumping Station – dam, reservoir and pumping station, built in 1890s to supply water to Bristol. The visitors centre seems to be closed in 2017 and may not reopen. (bristolwater.co.uk/blagdon-lake/)

Clay Mills Pumping Station, Burton-on-Trent – contains four Woolfe compound beam engines. (claymills.org.uk/)

Abbey Pumping Station – opened 1891 to pump Leicester's sewage. (leicester.gov.uk/leisure-and-culture/museums-and-galleries/our-venues/abbey-pumping-station/)

Crossness Pumping Station – opened 1865 as part of Sir Joseph Bazalgette's sewage system for London. (crossness.org.uk/)

Eastney Beam Engine House – a pair of Boulton and Watt beam engines built to pump Portsmouths sewage. (portsmouthmuseums.co.uk/museum-service/Eastney-Beam-Engine-House)

Cambridge Museum of Technology – Sewage pumping facility complete with original 1897 horizontal steam engines and later gas engines and electric pumps. (museumoftechnology.com/home2)

Sources

Naylor, P. (2005) *Water Supply* (Shire).

Planel, P. (2000) *Locks and Lavatories: The Architecture of Privacy* (English Heritage Gatekeeper Series).

Palmer, M, Nevell, M, Sissons, M. (2012) *Industrial Archaeology: A Handbook*, Council for British Archaeology Practical Handbooks.

Activities – Utilities - Gas & Electricity

Curriculum Links.

History: Chronological understanding – understanding progression and change in the development of the gas and electricity industries.

Knowledge and understanding of the lives of significant individuals in Britain's past (Michael Faraday, William Murdoch).

Examination of the locality and historical source materials for evidence of significant historical events (implementation of gas street lighting for example).

Historical interpretation and enquiry – examining primary and secondary source materials, investigating past events.

Science: Investigate materials and their properties. Examine light and states of matter. Identify common appliances that run on gas and electricity.

Design & Technology: Exploring how products have been designed and made in the past. Identifying how products contribute to lifestyles and consumer choices. Explore the impact of ideas, design decisions and technological advances.

English: By examining a range of historical sources, noting their observations and discussing their findings pupils will demonstrate the core skills of reading, writing and speaking and listening.

ICT: Gathering, analysing and presenting information about the development of the electricity and gas industries using a variety of media.

Activities – Utilities - Gas & Electricity

Activities – use the images in the pack to assist you with the following activities:

- Use Ordnance Survey maps or Google Streetview to look for evidence of the gas and electricity industry in your locality. Look for buildings, street signs and names, and street furniture that provide evidence of gas works, gas holders, gas lighting, local electric power stations and early electric lighting, etc.

- Identify appliances in the home that use electricity and gas. Compare modern day appliances with appliances from the past. Discuss changes in lighting and identify different light sources. Examine changes in the way we cook food and heat and light our homes and discuss the wider impact these changes have had on our society.

- Discuss safety in relation to electricity and gas. Identify safe and unsafe practices and create a short film or safety leaflet.

- Understand electricity generation. Pupils could construct simple series circuits, trying different components, such as bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils could draw the circuit as a pictorial representation. Explore vocabulary associated with electricity and electricity generation (current, voltage etc.).

- Adaptive reuse of buildings – Examine some buildings associated with the gas and electricity industry. Use Battersea and Bankside (Tate Modern) power stations as case studies. Identify the challenges and opportunities for sustainable reuse of these structures.

- Examine the environmental impact of the use of fossil fuels on the landscape and identify and discuss the use of alternative energy sources.

Activities – Utilities - Water & Sewage

Curriculum Links.

History: Chronological understanding – understanding progression and change in the development of the public water supply and sewage disposal industries.

Knowledge and understanding of the lives of significant individuals in Britain's past; John Snow, Edwin Chadwick, Sir Joseph Bazalgette.

Examination of the locality and historical source materials for evidence of significant historical events (water towers, pumping stations).

Historical interpretation and enquiry – examining primary and secondary source materials, investigating past events.

Science: Investigating forces and motion.

Design & Technology: Investigating the history of design and technological innovations in Britain from the Industrial Revolution onwards.

English: By examining a range of historical sources, noting their observations and discussing their findings pupils will demonstrate the core skills of reading, writing and speaking and listening.

ICT: Gathering, analysing and presenting information about the development of the public water supply and sewage disposal industries using a variety of media.

PHSE: Understanding why health & hygiene are important and that bacteria and viruses can affect health. Taking responsibility for personal hygiene.

Activities – Utilities - Water & Sewage

Activities – use the images in the pack to assist you with the following activities:

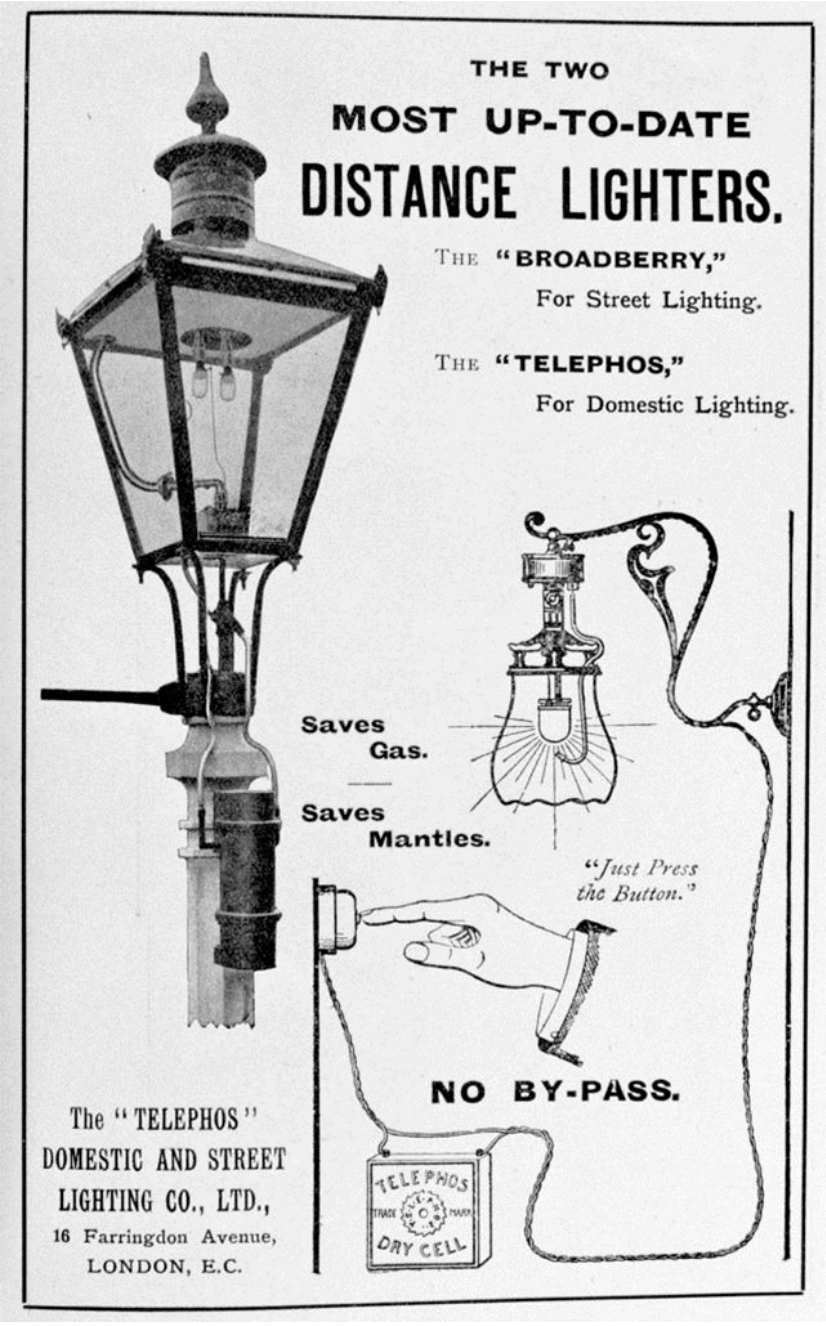
- Use Ordnance Survey maps or Google Streetview to look for evidence of the water and sewage industry in your locality. Look for buildings, street names and signs, street furniture, etc, to provide evidence of water storage, pumping stations, sewage treatment works.
- Discuss bacteria and the spread of infections by examining the importance of hand washing. Ask pupils to think about the methods which could be used to improve hygiene in school. Design a poster encouraging hand-washing and think about where it might be displayed in school.
- Investigate living conditions, the cholera outbreaks and the 'Big Stink' which preceded the 1875 Public Health Act. Produce a piece of persuasive writing from the perspective of a Victorian social reformer, urging politicians to take action to create a cleaner, healthier city.
- Use ICT to research the development of local water supply facilities. Design and create a poster advertising the opening of a new, local water pumping station. List the public health benefits of the new facility.
- Investigate the forces and motion involved in the movement of water from source to customer – Examine gravity forces and pressure.
- Use investigations into the public health reforms in Victorian Britain as the starting point for research into the clean water crisis in Africa.

Images – Utilities - Gas

Gas Lamp, Kings Cross, Camden Town, London

A street view with an open gas street light in the foreground and the gas holders at Kings Cross in the distance. The photograph was taken 1946 - 1969.

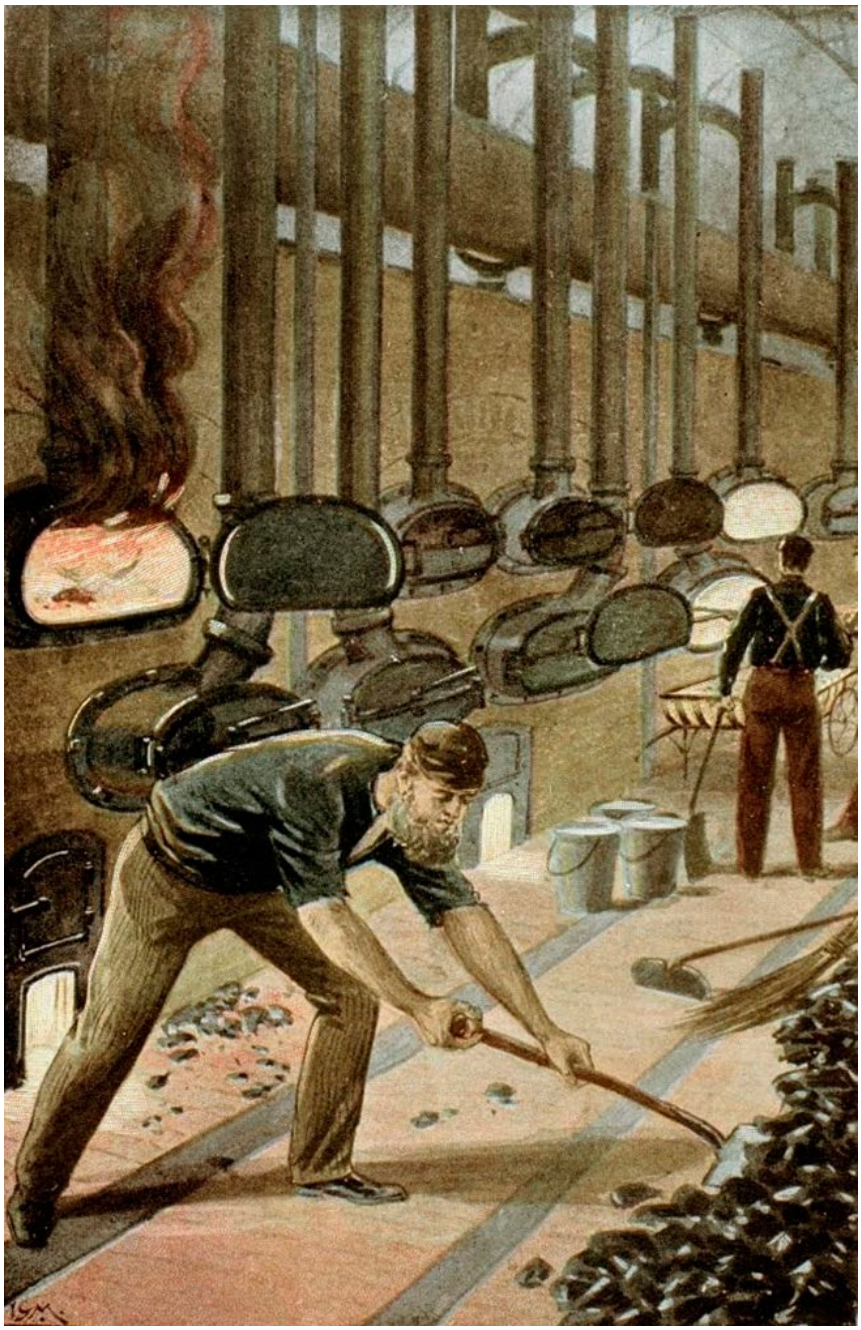
Images – Utilities - Gas



Advertisement for a gas lighter

An advertisement for an electric gas lighter which appeared in W Hole, *The Distribution of Gas* (1912). Previously, gas lights had to be lit using a naked flame.

Images – Utilities - Gas



Advertisement Stoking in a gas retort house

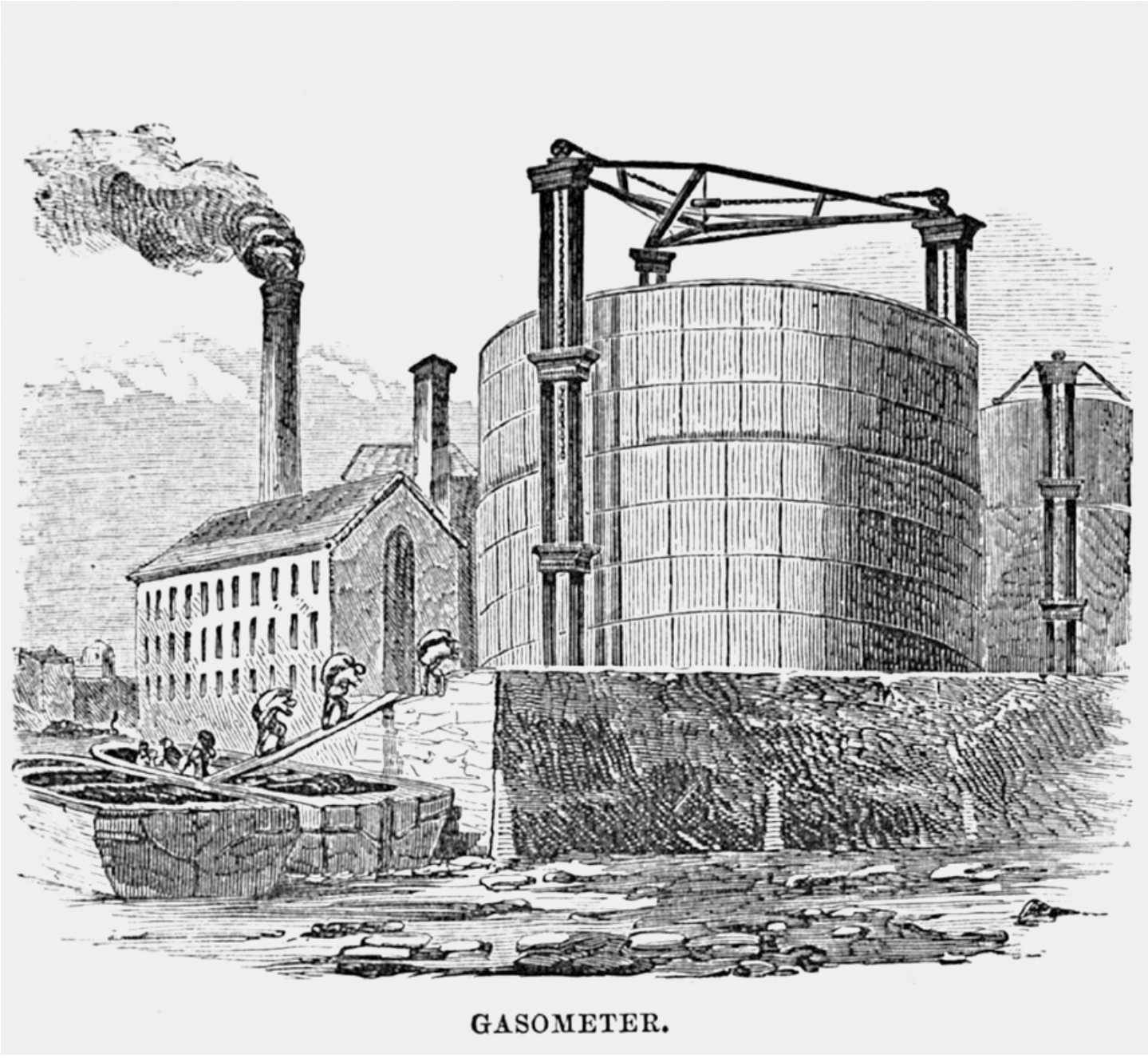
An illustration from M T Yates, *Graphic Stories of Inventions* (circa 1904), showing men stoking the retorts in a gas retort house. A 'retort' is an oven in which coal is baked to release coal gas. The process was superseded by the use of natural gas.

Images – Utilities - Gas

Retort house at Fakenham Gasworks, Norfolk

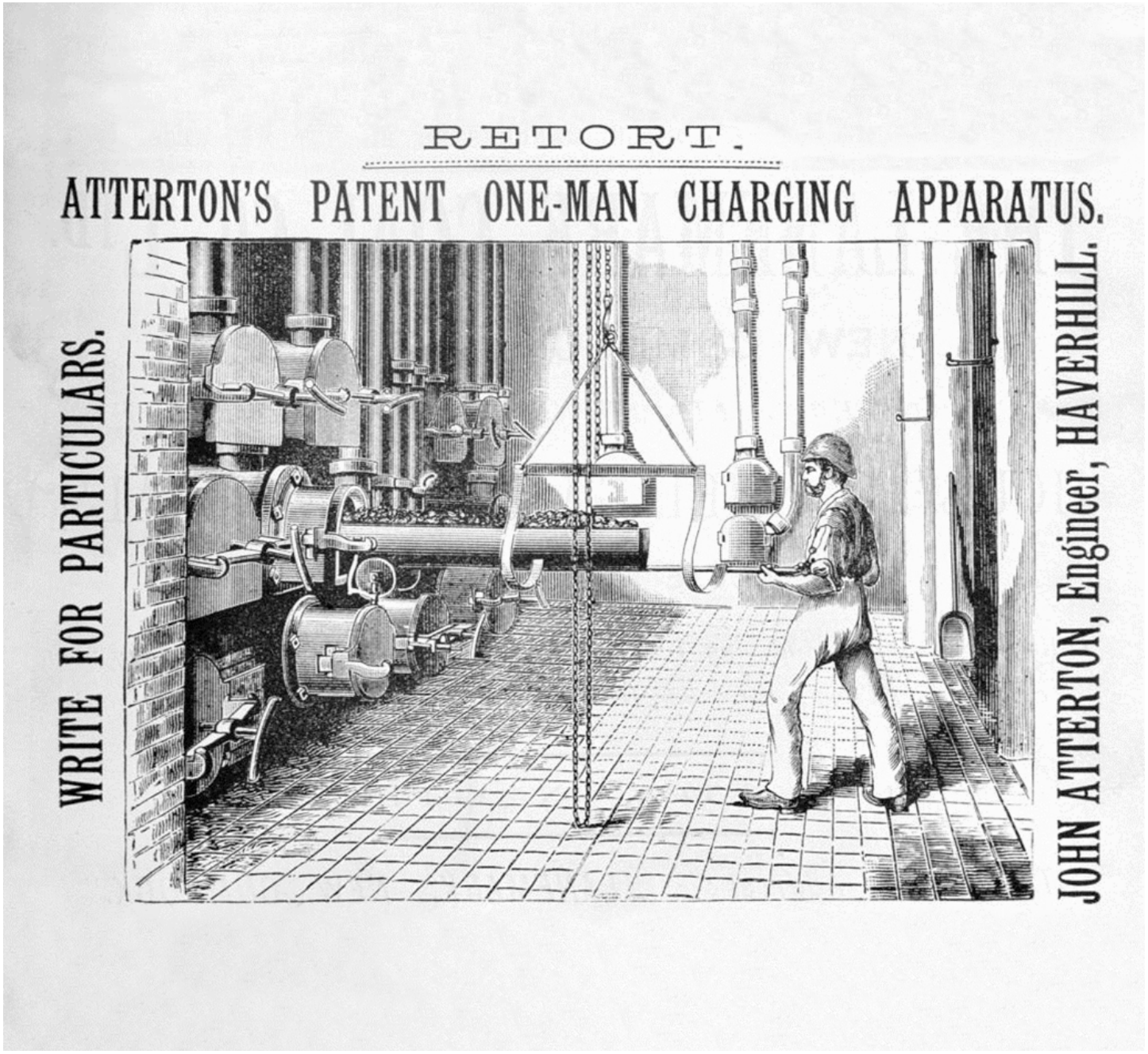
Before the exploitation of natural gas, most towns had their own gasworks to meet their need for domestic gas. Coal was baked in the retort house to release coal gas. The gasworks at Fakenham were opened in 1846 and closed in 1965. They are now a museum.

Images – Utilities - Gas



Gasometer from The Boys' Book of Industrial Information

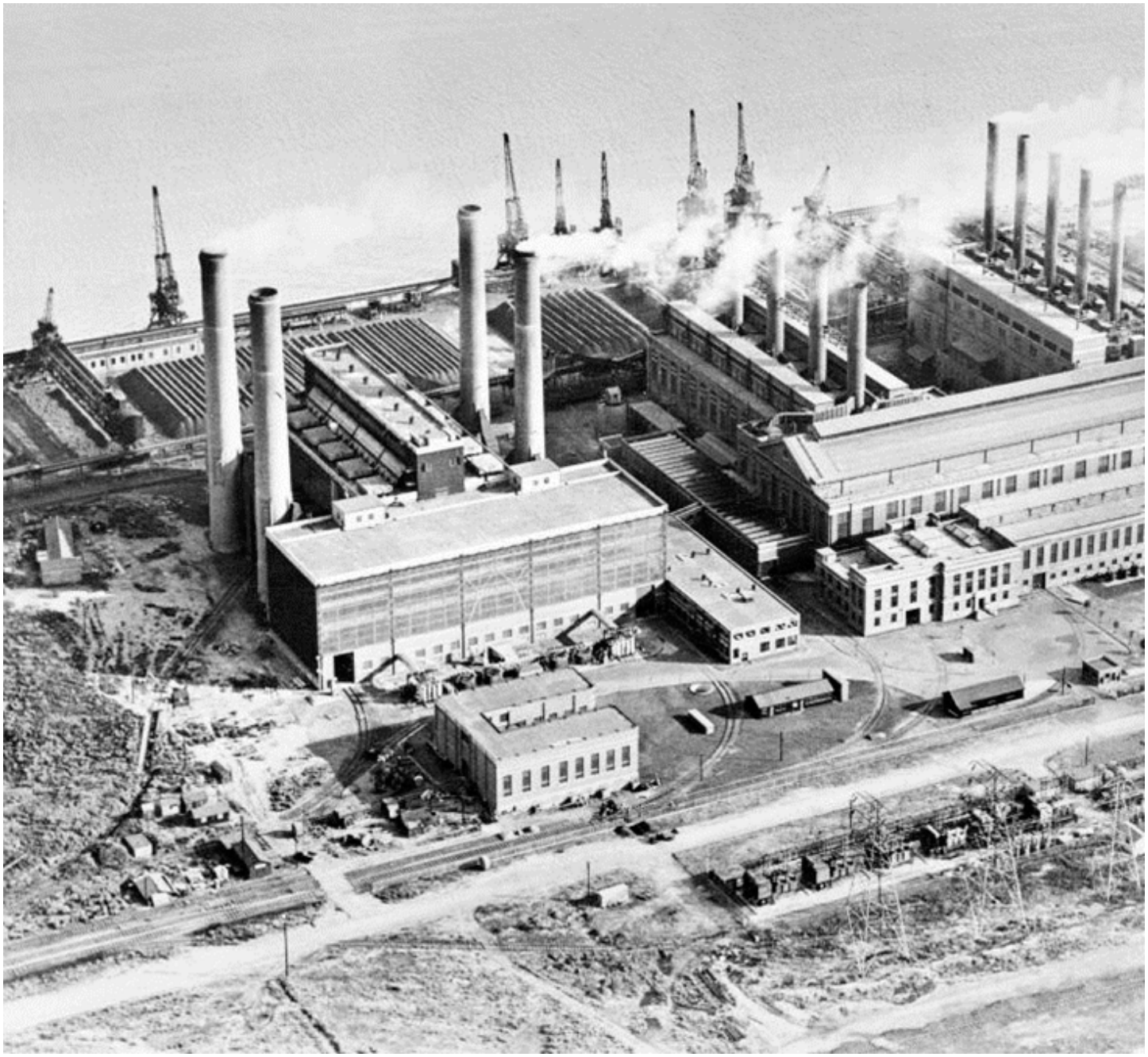
This page from *The Boys' Book of Industrial Information* (circa 1870) shows a gas holder (a gasometer is actually the meter within the holder that measures the amount of gas held). Books of this type demonstrate the high level of popular interest in engineering and technology during the Victorian period.



Advertisement for Atterton's patent one-man charging apparatus

An advertisement from Newbiggin's Handbook for Gas Engineers and Managers (5th edition, 1889). The Victorians' faith in engineering produced solutions to every need. The advert suggests that this gadget will increase efficiency in the gas-manufacturing industry, allowing one man to do the work of a team.

Images – Utilities - Electricity



Barking Power Station, Creekmouth, Barking, Greater London

This oblique aerial photograph shows Barking A and B power stations. Barking A was opened 19th May 1925 on the North bank of the River Thames. In 1927 it took over from the Barking Urban District Council station, to provide a bulk electricity supply. Next to it is Barking B power station which became fully operational in 1939. Barking C was added in 1954. From the 1930s into the 1950s Barking was claimed to be the largest steam-generating power station in Europe.

Images – Utilities - Electricity

Battersea Power Station, Battersea, London

Battersea Power Station seen from the north bank of the Thames. It was designed in 1937 by Sir Giles Gilbert Scott and was the largest brick building in Europe. This photograph is from the period 1945 to 1980.

Education

Teacher's Kit

Images – Utilities - Electricity

Eggborough Power Station, North Yorkshire

Eggborough Power Station was built alongside a railway, which carried coal to the plant. The power station was built in the 1950s and supplies electricity to the National Grid. A line of pylons can be seen on the far side of the site. This photograph is from May 1993.

Images – Utilities - Electricity

Cragside, Cartington, Northumberland

Interior of the dining room at Cragside, taken in August 1891. Cragside is believed to be the first house in the world to be lit by electric bulbs. Cragside was built in 1864. It was the home of the 1st Lord Armstrong (1810-1900). He was an industrialist and inventor.

Images – Utilities - Electricity

Chelsea Electricity Supply Company, Flood Street, Chelsea, Greater London

Scaffolding erected around a chimney shaft at the Chelsea Electricity Supply Company on Flood Street. Construction on the site was carried out by builders Holliday & Greenwood for whom the photograph was taken (dated 13th October 1896). This site is probably part of the generating station that was designed by Alfred Roberts and constructed between 1896-1901.

Images – Utilities - Electricity

Lamp post on the corner of Gordon Square and Gordon Street, Camden, Greater London

This early electric lamp post was made in the 1890s by McDowell, Steven and Co. It is of historical interest as the last remaining lamp of this type from what was a pioneering authority in electric street lighting (1892) in London. This photograph was taken in 2004.

Images – Utilities - Water & Sewage

Papplewick Pumping Station, Longdale Lane, Papplewick, Nottinghamshire

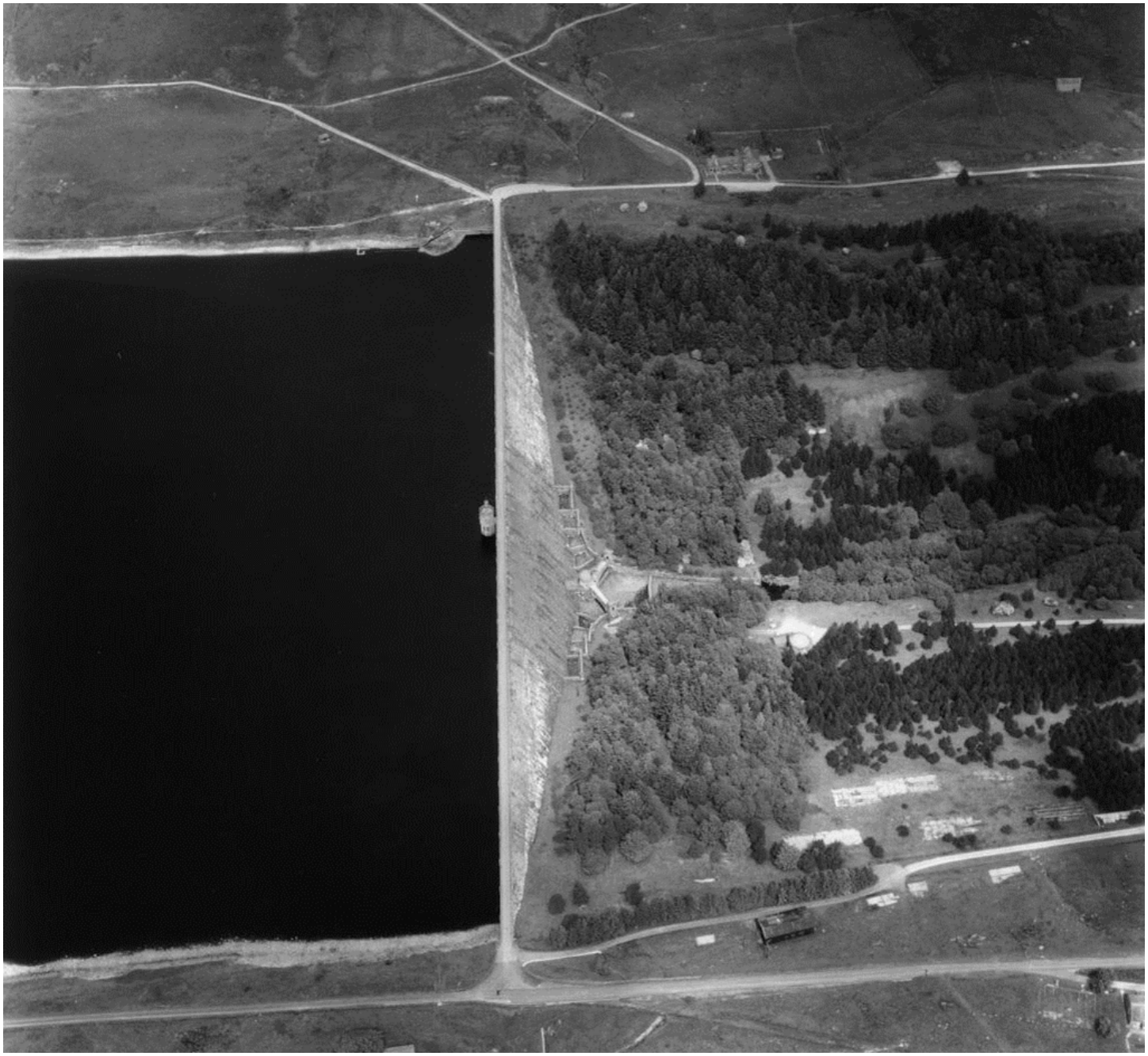
This highly finished waterworks proclaims civic pride - who would ever see it? It was built in 1884. Two beam engines, made by J Watt & Co, supplied Nottingham with 1.5 million gallons of water a day. The beam engines were replaced by electric pumps in the 1960s; otherwise, the engine house changed very little between 1935 and 1994, when this photograph was taken, It is now a museum.

Images – Utilities - Water & Sewage

East London Water Works, New Road, Barking, Greater London

The workforce pose with shovels and picks beside a wooden tower at the New Road Waterworks in Dagenham in September 1896. Polluted water from the Thames caused many outbreaks of disease, especially cholera. The Metropolitan water Act of 1852 tackled some of the problems of the water supply, but it took until the end of the century before the necessary changes were fully implemented.

Images – Utilities - Water & Sewage



Scar House Reservoir, Stonebeck Up, North Yorkshire

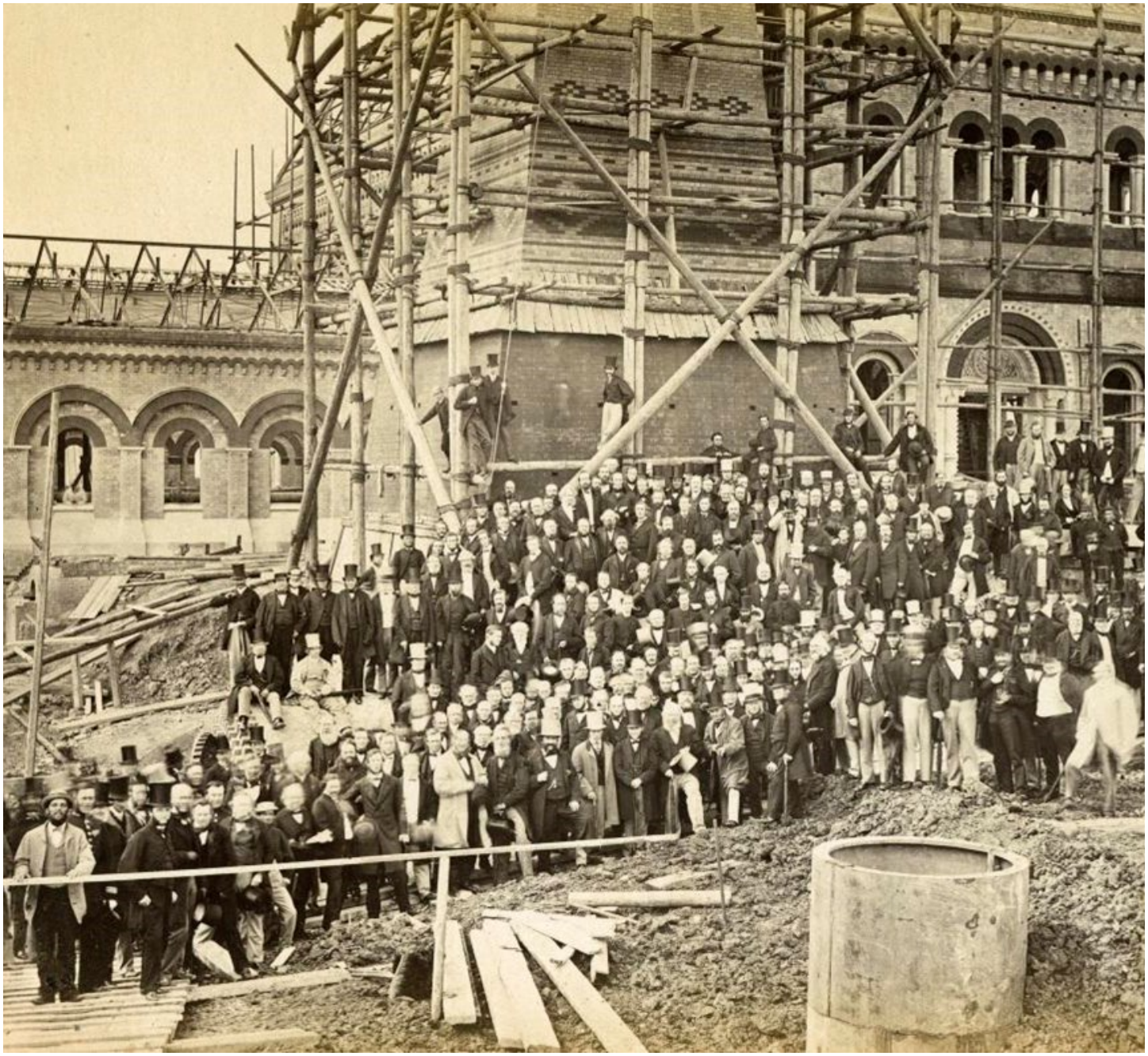
This reservoir on the River Nidd was built to supply water to Bradford, some 65km away. It was begun on 13th July 1904 and completed seven years later. A workers' village was constructed by the side of the reservoir for the labourers employed on the project. Several archaeological features were lost beneath the 33.5m of water. This photograph is from June 1998.

Images – Utilities - Water & Sewage

Rimswell Water Tower, Rimswell, East Riding of Yorkshire

This water tower at Battys corner is dated 1916. (photographed in 2002). It was built from reinforced concrete for Hull Corporation Waterworks. A plaque is inscribed: CITY OF HULL WATERWORKS WITHENSEA AND SOUTH HOLDERNESS SUPPLY 1916. The base contains pumps and a 300,000 gallon tank. The upper tank, of 100,000 gallon capacity, surrounds the central tower which carries a spiral staircase and pipe-work dated 1914.

Images – Utilities - Water & Sewage



Crossness Pumping Station, Bexley, Greater London

A large group of men, many in top hats, posed in front of Crossness Pumping Station, Bexley, which is surrounded in wooden scaffolding, and which was officially opened on 4th April 1865, the photograph is from 1864. It was constructed to pump and release the sewage from the three intercepting sewers south of the Thames. It is possible that one of the group shown in the photograph is Sir Joseph Bazalgette, the chief engineer responsible for the design and construction of the sewerage and water treatment systems in London.

Images – Utilities - Water & Sewage

Oxford Waterworks, Oxford, Oxfordshire

Looking across the sewage treatment works from the filter beds, taken in 1914, with the chimney of the pump house in the background. The works operated from 1854 to 1933 after which the site became a leisure facility, Hinksey Park, the filter beds being converted to an outdoor swimming pool.