

100 Years of Public Electricity Supply in Bristol

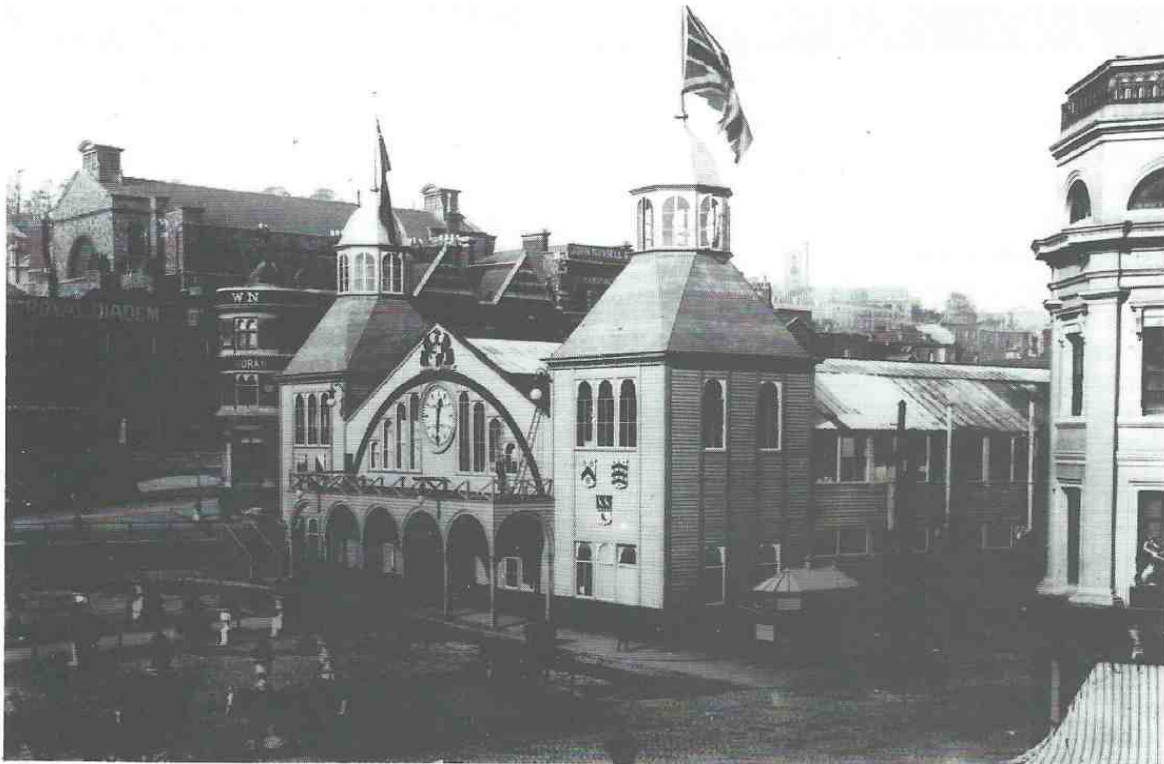
Peter Lamb

100 years ago, on 28 August 1893, the first public electricity supply was switched on in Bristol. It was not the first in the South West (that credit goes to Taunton Electric Light Company in 1886) but it was the first municipal initiative in the south west to promote a public supply and only the third in the country.

Bristolians had seen public demonstrations of the application of electricity some 30 years previously when a Mr Phillips of Weston-super-Mare lighted the Clifton Suspension Bridge on its opening and, a year later, the portals of the Victoria Rooms to celebrate the marriage of Prince Edward and Princess Alexandra. Other demonstrations followed, including a display of lighting (by arc lamps) around the central streets of Corn Street and Broad Street in 1882 by the Brush Electrical Company. This display was obviously impressive since the Sanitary Committee, who had been charged with pursuing the supply of electricity, sought for a provisional order and appointed as consultant Mr (later Sir) William Preece, Chief Electrical Engineer to the Post Office. His reports to the committee over the next ten years regularly display a 'wait and see' policy on account of the many developments taking place in the industry at that time. He visited Taunton but was not impressed with their belt-driven machinery. Judging by photographs, the installation at Taunton was probably very crude, inefficient and regularly subject to breakdowns. Also, the gas lobby was strong and the price of gas in the late 1880s was but half the price of electricity.

Eventually, by 1891, the developments in electrical machinery were such that the price of electricity had dropped and Preece recommended the go-ahead for a 'central station'. A site was chosen at Temple Back and it was decided to put down two systems, an AC system for domestic supplies and a DC system for street-lighting with arc lamps. AC was generated at 2,000 volts and transmitted to small air-cooled transformers for reduction to 105/210 volts 3-wire for distribution to domestic customers. The DC was generated at 600 volts initially, which would later be changed to 500/250 volts to accommodate the first motor supplies. Six machines were installed consisting of reciprocating steam engines direct-coupled to generators, with a total potential output of 700 kW. Today this would only be enough to supply some 300 houses. The original building still stands, opposite the later fire station.

The first switch-on was greeted with great enthusiasm since it was discovered that a group of City businessmen, together with the City fathers, were planning a temporary exhibition to celebrate the cover-up of the River Frome in the Centre. It was decided to combine the two events and cables were hastily laid along Baldwin Street to the City Centre to supply the arc and carbon filament lamps installed in the splendid pavilion of the Industrial and Fine Arts Exhibition and the large electric clock (the first in Bristol?) on the front of the building. The first customers were 26 shops in the High Street and Wine Street area, including that of the Deputy Chairman of the Electrical Committee, George Pearson, who became the Chairman a year later and was to steer the undertaking through its most formative years.



Industrial & Fine Arts Exhibition, Bristol Centre, 1893 (Reece Winstone Archive)

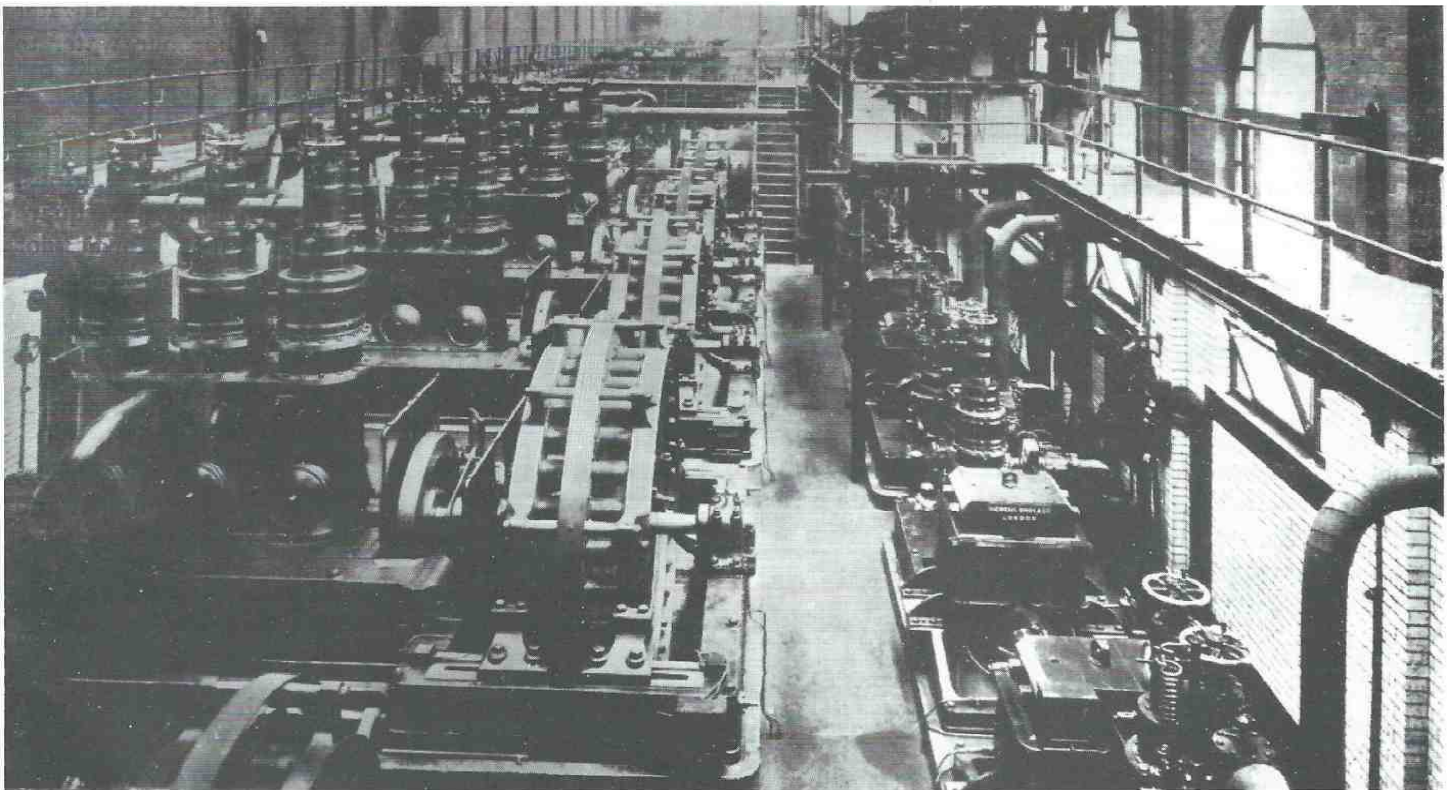
The first chief engineer was Mr Harold Faraday Proctor, who was appointed to oversee the construction of the new power station at Temple Back - or 'Electricity Works' as such buildings were known as in those days. He had an interesting background which may have influenced his appointment. His father was the scientist, Bernard Proctor, from Newcastle, who assisted Joseph Swan in the development of the electric filament lamp. His mother was a niece of Michael Faraday, who discovered in 1831 the means by which electricity is generated to this day. Proctor remained as chief engineer until 1932.

New customers and load were connected at such a rapid pace over the next seven years that, by 1900, the Temple Back building was full to capacity with additional machinery, even after at least two extensions involving tall chimneys. It was decided to buy a site for a much larger station and this was acquired at Feeder Road from the Avonbank Brick Co.

This rapid development occurred without the tramways' load. The Bristol Tramways Company built an independent station outside the then city boundary at Beaconsfield Road, St. George, and electrified their first line from St. George to Old Market in 1895. This venture was so successful that they managed to persuade the Board of Trade inspectors to give permission to build a further station near Temple Back at Counterslip. This was against the considerable opposition from the Bristol Corporation Electricity Department, who until then, had the monopoly of electricity supply within the city boundary. However, BCED were over-ruled and the station was built to a two-tiered American design with the boilers at the top of the building. The Corporation station had been built with the boiler-room at the side of the engine-room. The Counterslip building still stands and is very attractive after its recent conversion to offices for Courages Brewery.



Temple Back Electricity Works, 1900 (SWEB Archive)



Engine Room at Temple Back Electricity Works showing it full to capacity, 1900 (SWEB Archive)

The site at Feeder Road was large (ten acres) and grandiose plans were envisaged. The new building was described as *'only 1/33rd of the ultimate scheme'* but was commissioned in 1902 as the 'Avonbank Electricity Works'. It was a very utilitarian building unlike the Exeter Station at Haven Road built at the same time. It had two 745 kW AC generating sets powered by two 1,000 hp Willans reciprocating steam engines.

Generation was at 2,000 volts AC single-phase. Within a year a pair of Parsons steam turbine sets of 750 kW capacity were introduced. These were some of the earliest such units to be installed in the country. When the electricity supply was first established in Bristol it had been for the sole purpose of providing electric lighting, as indicated by the title on the Temple Back building 'Central Electric Lighting Station'. Arc lamps were installed in high columns for street-lighting, being supplied at DC. Arc lamps were too fierce and smelly for use in the home (like welding!) so lights in houses used carbon filament lamps. These were of very low wattage and only lasted a short time. They were supplied at 100 volts AC from air-cooled transformers situated in small underground substations or ground-mounted metal kiosks.

When BCED was first established, Frank Prosser, secretary since 1883, set up offices in old houses alongside the Temple Back works but soon found these to be very restricted. In 1911 the company moved to the Corn Exchange and stayed there until 1924, when new offices were found at the junction of Colston Avenue and Nelson Street. By the 1930s these were again found to be inadequate and an island site was acquired on the other side of the road, largely owned by Fry's chocolate factory. The site was fronted by offices known as Demerara House, on which was an elaborate carved wooden figurehead of an Indian Chief. This unfortunately fell apart when the building was demolished. On the site from 1936 rose the building known for many years as 'Electricity House'. The building was only a shell at the outbreak of the second world war and was acquired by the government for the manufacture of aircraft parts.

The expansion of the administration was due to consumer and load expansion of the 1920s and 1930s and the generating capability of the undertaking was again under strain. The BCED were therefore required to look for a site for another power station. In 1926 a new Electricity Act was passed which forced undertakings to co-operate with each other and a new body, known as the Central Electricity Board. The CEB was established with powers to build a nationwide grid network with injection from large stations. It was realised that BCED and CEB had a common goal and therefore a joint committee was established under the chairmanship of Harold Faraday Proctor, BCED's chief engineer. A site was chosen at Portishead Dock and thus Proctor became the major architect of all three of Bristol's power stations. The new Portishead Power Station was commissioned in 1929 and 33 kV cables laid to both Feeder Road and Avonmouth in Bristol and linked to the new 132 kV grid system supplying then a major part of the South West peninsula.

H.F. Proctor retired in 1932 and his place as chief engineer was

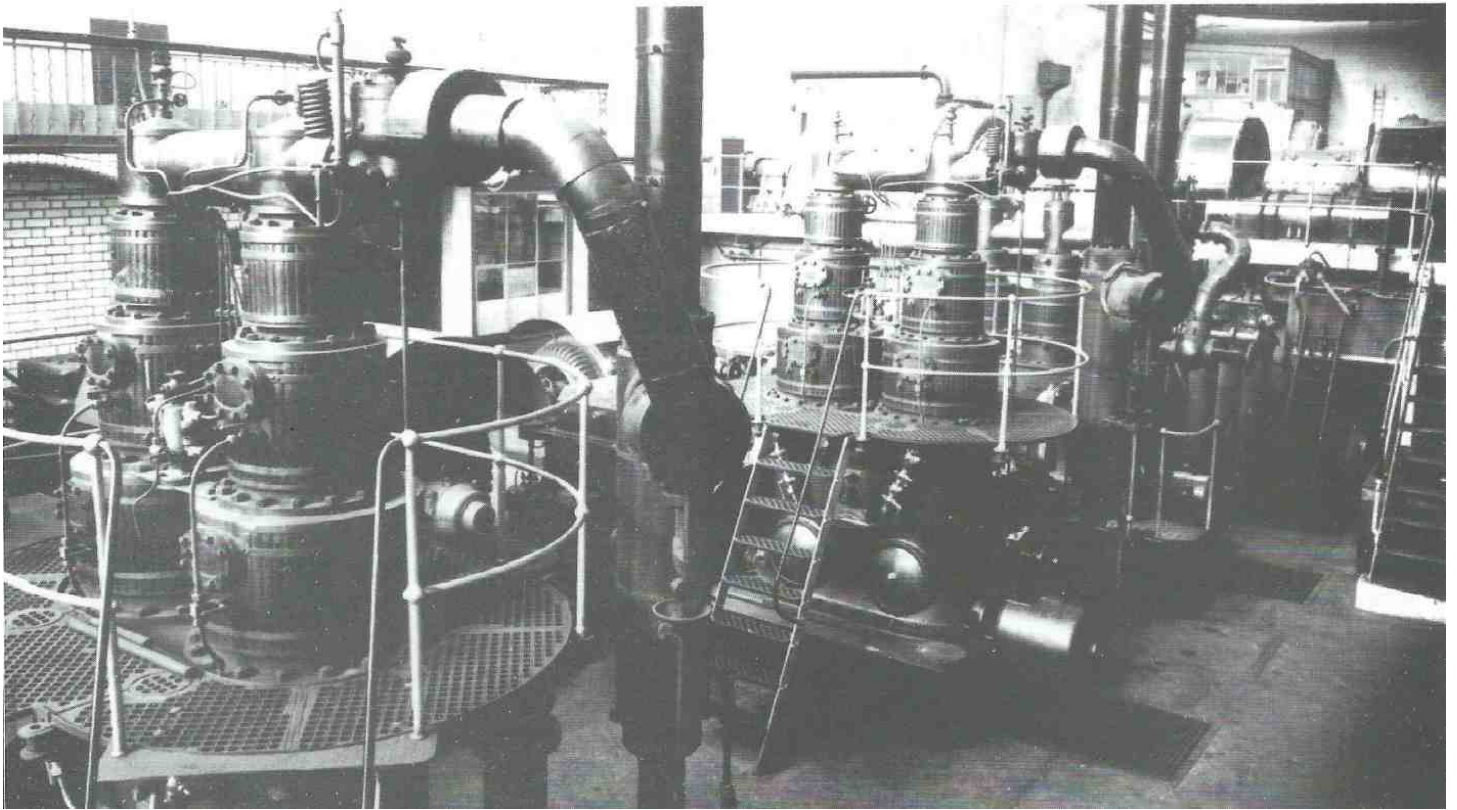


Cable laying along Baldwin Street, 1893 (SWEB Archive)

taken by his deputy A. J. Newman, who steered the undertaking until his retirement in 1944. He was replaced by I.A.D. Pedlar, who had to resign due to ill-health within nine months. In searching for a replacement, the Electrical Committee considered that the most suitable person to run the undertaking was their secretary and sales manager, E.C. Willis, but he was not an engineer. To overcome the problem they created the post of 'General Manager' with a subordinate 'Chief Engineer'. The latter post was 'blacked' by the Association of Municipal Engineers and this caused considerable difficulties in filling it.

The electrical system changed little in the next 20 years, a period of consolidation for the Portishead to Bristol electrical supplies. The organisation had many problems, mostly during the war, when their Colston Avenue building was bombed. Even then the staff were unable to move into Electricity House until nationalisation in 1948, when the building became the headquarters of the South Western Electricity Board.

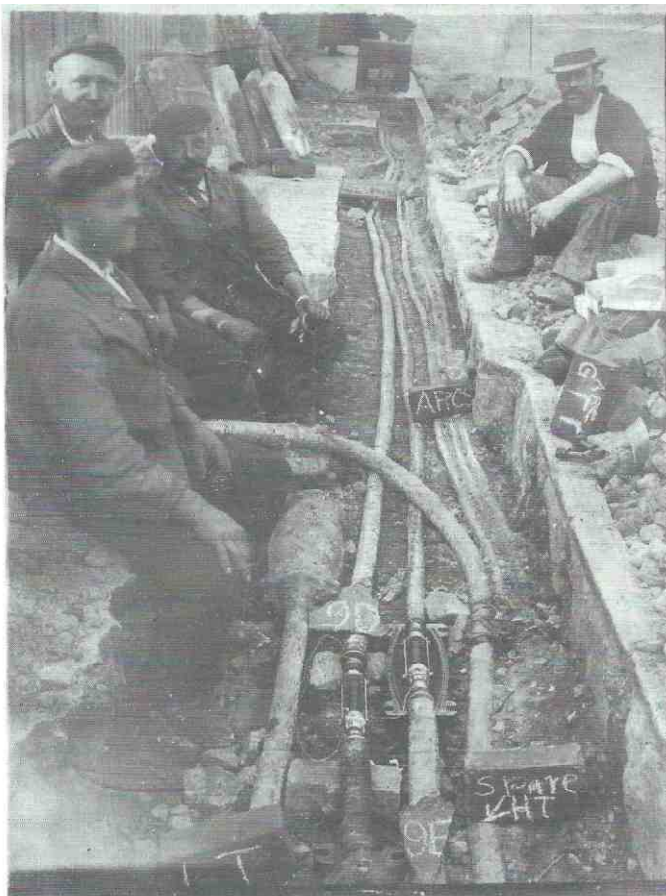
The sound systems and the organisation laid down by the officers and staff of BCED became the bedrock of the new SWEB organisation which kept its head office in the city and drew on many of the BCED staff. However, E.C. Willis was temporarily thwarted since the post of deputy chairman went to Plymouth's chief engineer, Harold Midgley. Willis had to be content with the post of Bristol Sub-Area Manager until Midgley retired and he took over this position.



Avonbank Power Station, Bristol

There were four engines, the two centre ones being triple expansion with a three-crank compound at each end. These were all house service units, feeding to a separate switch board for exciting the main generators and driving the auxiliary plant. The compound three-crank sets were probably moved from the original Temple Back station, which was driven entirely by Willans engines, whereas, after the initial two Willans sets, Avonbank was equipped with turbines of ever increasing capacity

(George Watkins Collection)



Jointers at work in Queens Road, Clifton c1905 (SWEB Archive)

Sources

Bristol Reference Library
Local newspapers

University of Bristol, Engineering Library
The Electrician

Bristol Record Office
BCED Minute Books

South Western Electricity PLC Archive Library
Information on all previous undertakings in the south west prior to 1948

Peter Lamb's booklet *Electricity in Bristol 1863-1948*, (1981), provides a more-detailed account of developments in Bristol.

See also two articles in previous editions of *BLAS Journal*:
Tucker, D.G., 'The Beginnings of Electricity Supply in Bristol 1889-1902', (1972)

Watkins G., 'Bristol Electricity Supply', (1970)