

Early History of Electricity in Plymouth

*Summary of a lecture delivered to the
Plymouth Athenaeum on 3rd November, 1988 by E.W. Luscombe*

The last two decades of the Victorian era have been aptly described as the time of the 'electric revolution'. Prior to 1880 public and domestic lighting was by oil lamp or gas flares - the incandescent gas mantle did not become generally available until about 1892, as a direct result from the competition of the electric light. At first electricity was used almost exclusively for lighting and tramways; but now 100 years later we have become so utterly dependent on the electricity supply that its failure causes severe disruption to our lives.

Early Experiments

It was about 1800 that Alessandro Volta produced an electric current from a simple battery, and a further significant step forward was achieved in 1808 when Humphry Davy showed how an electric arc - a source of brilliant light - could be produced from an electric current between two carbon rods. In 1831 Michael Faraday, 'the father of electricity' discovered the principle of electromagnetic induction i.e. the production of an electric current in a circuit within a moving magnetic field, and this led to the first practical electricity generators, which were exhibited at the Great Exhibition of 1851. The combination of the arc light and the electricity generator was used for the South Foreland lighthouse in 1858. The arc light was very suitable for such purposes, for street lighting and other outdoor places, but it was not until Edison and Swann, working independently but along similar lines, made the first carbon filament incandescent lamps in the late 1870's that domestic electric lighting became feasible.

The Three Towns

In this lecture, Plymouth is taken to be the three towns, Plymouth, Devonport and Stonehouse, as they then were. Each had its own approach to the establishment of a public electricity supply and each must be considered separately. The first public demonstration of the electric light in the three towns was by Mr. J.M. Hearder who, at the invitation of the President of the Devonport Mechanics Institute, installed, on 12th April 1849, an arc lamp at the top of the Devonport Column. A directional beam was produced, rather like a searchlight. Whilst some disappointment with the results was expressed in the local press, the light was clearly seen from Bovisand and Trematon Castle. But it was still to be 50 years before any sort of public supply would be seen in the three towns.

The first use of the electric light in Plymouth was for the lighting of the Promenade Pier which was opened on 29th May 1884. It was lit by 18 Brush arc-lamps and 32 incandescent filament lamps supplied from two Brush generators driven by 16 horse power Otto gas engines. But it was not without its initial difficulties. The Western Morning News reported on 2nd June 'In consequence of the low pressure of the gas at the Plymouth pier yesterday the electric light could only be used for about three-quarters of an hour and even then not up to full power. It is to be hoped that arrangements will be made with the Gas Company

so that full power may be available at the time that the electric light is required! How often since has an electricity supplier had problems with the fuel supply?!

Especially, as in this case, when the Gas Company perceived a serious rival!

Other prominent buildings which were lit by electricity using in-house generators long before a public supply came into being, included the Drill Hall (1885), the Theatre Royal (1889) and the Stonehouse Town Hall in 1893.

The Setting Up of Public Systems

The first public electricity system was set up at Godalming in 1881. In towns all over the country supply companies were established to install generators and cables, and to invite customers. Under the terms of the 1882 Electricity Act such companies were required to obtain a Provisional Order from the Board of Trade to enable them to carry out the necessary works. But the local authority had the power to veto, and also the right to purchase the system after 21 years at scrap value! This particular clause put an effective damper on the development of the new industry, and had a long lasting adverse effect on the British manufacturers of equipment. There were few schemes between 1882 and the 1888 Electricity Act in which the 'right to purchase' term was increased to 42 years then as a going concern.

Plymouth Beginnings

The first reference in the Plymouth borough records to electricity was in 1882. No less than seven companies indicated their intention to apply for Provisional Orders, but they were all vetoed by the Corporation. But after the 1888 Act there was a surge of interest by private companies. In 1889 the Devon and Cornwall Electricity Supply Company was set up which sought powers to supply Plymouth, Devonport, Stonehouse and Compton Giffard. The Plymouth Borough Council set up an Electric Lighting Committee (28th August, 1889) which, jointly with the other local authorities considered the D.C.E.S.Co. proposals. But nothing came of it, and a possible opportunity was lost for the three towns to have electricity some ten years before they did, and more important, a fully integrated system.

Whilst other towns e.g. Taunton (1886), Bath (1890), Exeter (1890) and Bristol (1893) were being lit by electricity, there seemed to be no enthusiasm in the three towns, and little more was heard of the electric lighting committee. It seems strange that Plymouth, then a town of about 100,000 people should have lagged so far behind, but there was obviously a distrust of the private companies and at the same time little initiative or vision among the councillors. Perhaps also because the Corporation owned the Gas Company!

It was pressure from the towns people, particularly the shopkeepers which led to the Corporation to deciding 'that the time has come!' and to the application for, and the granting of, the Plymouth Corporation Electric Light Order 1894. Being so late on the scene, Plymouth was able to benefit from the experiences of other towns, and invited Dr. J.A. Fleming, FRS to make recommendations as to the type and size of a system which was to include not only lighting but electric tramways. His proposal included a power station at

Prince Rock, an electric tram system from Prince Rock to the Theatre Royal, and the provision of public arc lighting in the main shopping streets and on the Hoe promenade. Incidentally several of the Hoe lamp posts still remain emblazoned with the Borough coat of arms and PCEW 1898 (Plymouth Corporation Electricity Works and the year in which they were erected).

A new Electric Lighting Committee was set up (9th November, 1895) under the Chairman, Councillor J. Willoughby, to consider these recommendations, and it appointed Mr. J.H. Rider as the Borough Electrical Engineer on 27th April, 1896. Mr Rider had had considerable experience at Bolton (the committee had visited the Works there) and together with his assistant Mr. E.G. Okell set about the detailed planning. Mr. Okell was himself to become Borough Electrical Engineer in 1909 and remain as such until 1934. The foundation stone of the station at Prince Rock was laid by the Mayor Ald. J.T. Bond on 21st April, 1898. Meanwhile the first cables were laid in Ebrington Street and Old Town Street, and the overhead lines erected for the trams.

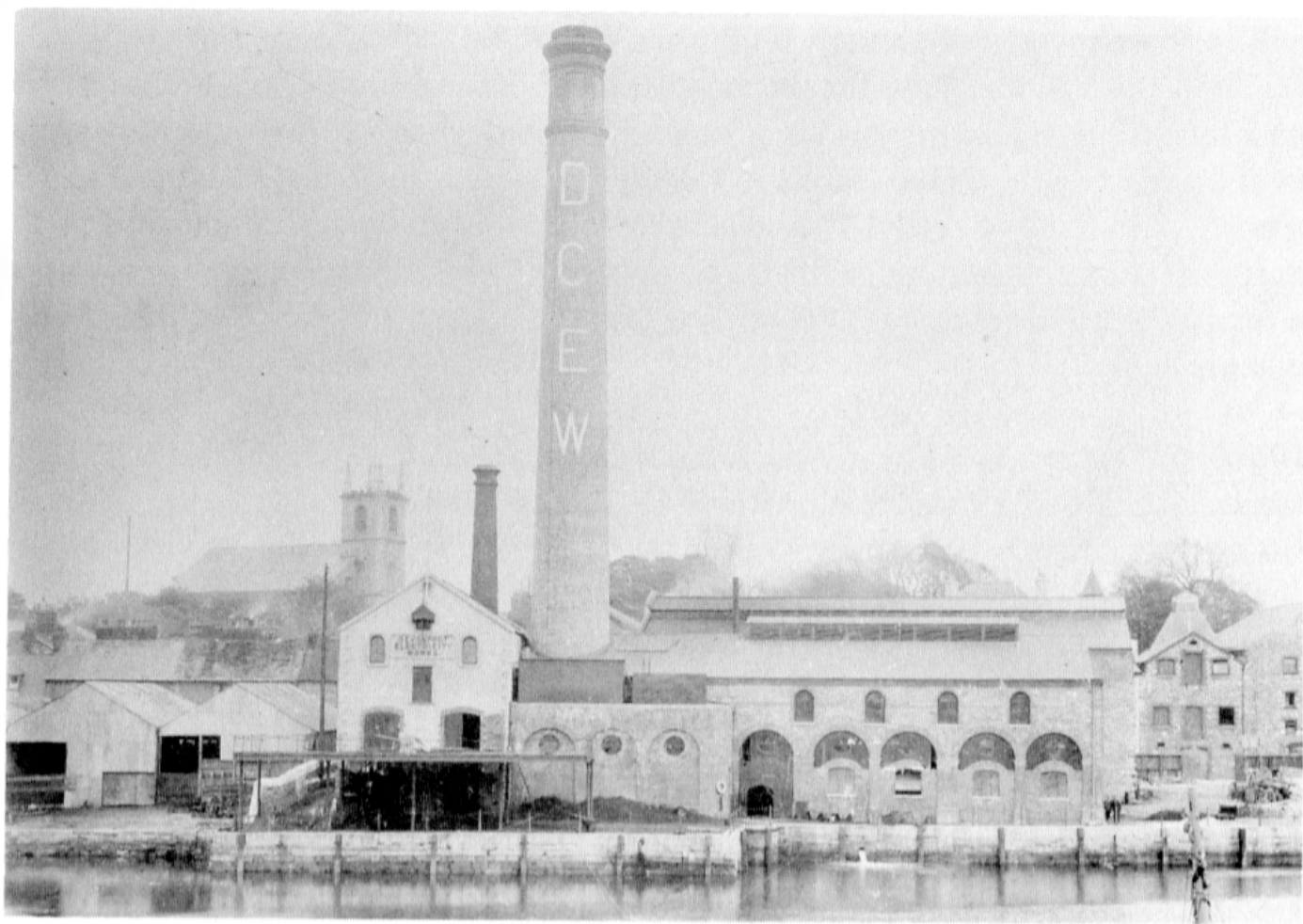
The opening ceremony of the Plymouth Electricity Works took place on 22nd September, 1899. Ald. C.H. Radford, Chairman of the Electric Lighting Committee invited the Mayor, Ald. John Pethick to make the formal declaration, and they, together with Mr. Rider, took their place on the platform of No.1 Tramcar and travelled to the Guildhall for a celebration luncheon.

The Mayor proposed "Success to the Electricity and Tramways Undertaking". He expressed his conviction that it would prove one of the best and most profitable ventures the Corporation had ever entered upon. He urged the application of electric traction to the Mannamoad section! At last do we perceive some enthusiasm amongst the aldermen and councillors for electricity?

The station was one of the first in the country to supply power for both lighting and traction. During the day the generators supplied the trams and charged batteries. At night the generators supplied the lighting whilst the trams largely obtained their power from the batteries. The system was thus very efficient, and the electricity installation was always in profit. The installed capacity of the station was 800KW, and apart from the trams was able to supply up to 7500 8 candle power (i.e. about 30 watt) lamps. Initially there were 133 private consumers. But such was the success of the venture that within three months the demand to be connected far exceeded the capacity and the installation of more generators was already in hand. By 1914 the installed capacity had reached 3150KW, and the number of private consumers was 1753. But the vast majority of the towns people did not have electricity until well after the Great War.

Devonport and Stonehouse

Meanwhile what was happening in Devonport and Stonehouse? There seemed to be even less enthusiasm than in Plymouth, But with pressure from ratepayers and shopkeepers and particularly from the tramway companies who could see the trends in neighbouring



The Devonport Corporation Electricity Works, Newport Street, Stonehouse Creek in Foreground

Plymouth, the Devonport Corporation applied for and obtained the Devonport Electric Lighting Order 1896.

An Electric Lighting Committee was set up (26th August, 1897) which decided to seek the advice of a consultant engineer and chose Professor A.M.B. Kennedy who submitted his report on 6th June 1898.

The committee were preoccupied in finding a suitable site for the power station. No less than eight sites were considered, all adjacent to the waterside for the easy delivery of coal, etc., but all were objected to by either the Admiralty or Lord St. Levan who between them owned most of Devonport. Mr Charles Furness was appointed Borough Electrical Engineer on 1st June 1899 and initially made his office in rooms of the Devonport Technical College. The problem of the station had still not been resolved, but efforts were redoubled especially in that the Devonport and District Tramways Company were pressing for current for their new trams which were already under construction, and were threatening to build their own station!

However, negotiations were under way with the East Stonehouse District Council. They had already obtained their own Stonehouse Electric Lighting Order 1889, but agreed to transfer their rights to Devonport under a joint scheme, and were also able to offer a site at Newport Street for the power station. And so the Devonport Electricity Works were actually

built in Stonehouse! In February 1900 when it is to be remembered that Plymouth had already had a public supply for six months, the Electrical Engineer submitted detailed plans for the station and for various other works. The Devonport Tramways were pressing for and expecting to receive current in August, but were assured that such plant as would be necessary would be ready! The main cable to Devonport would, of course, need to be taken across Stonehouse bridge but the owners, the Tolls Co. Ltd. declined to discuss this so long as they were required to contribute to the rates, and also expected free current to light the bridge!

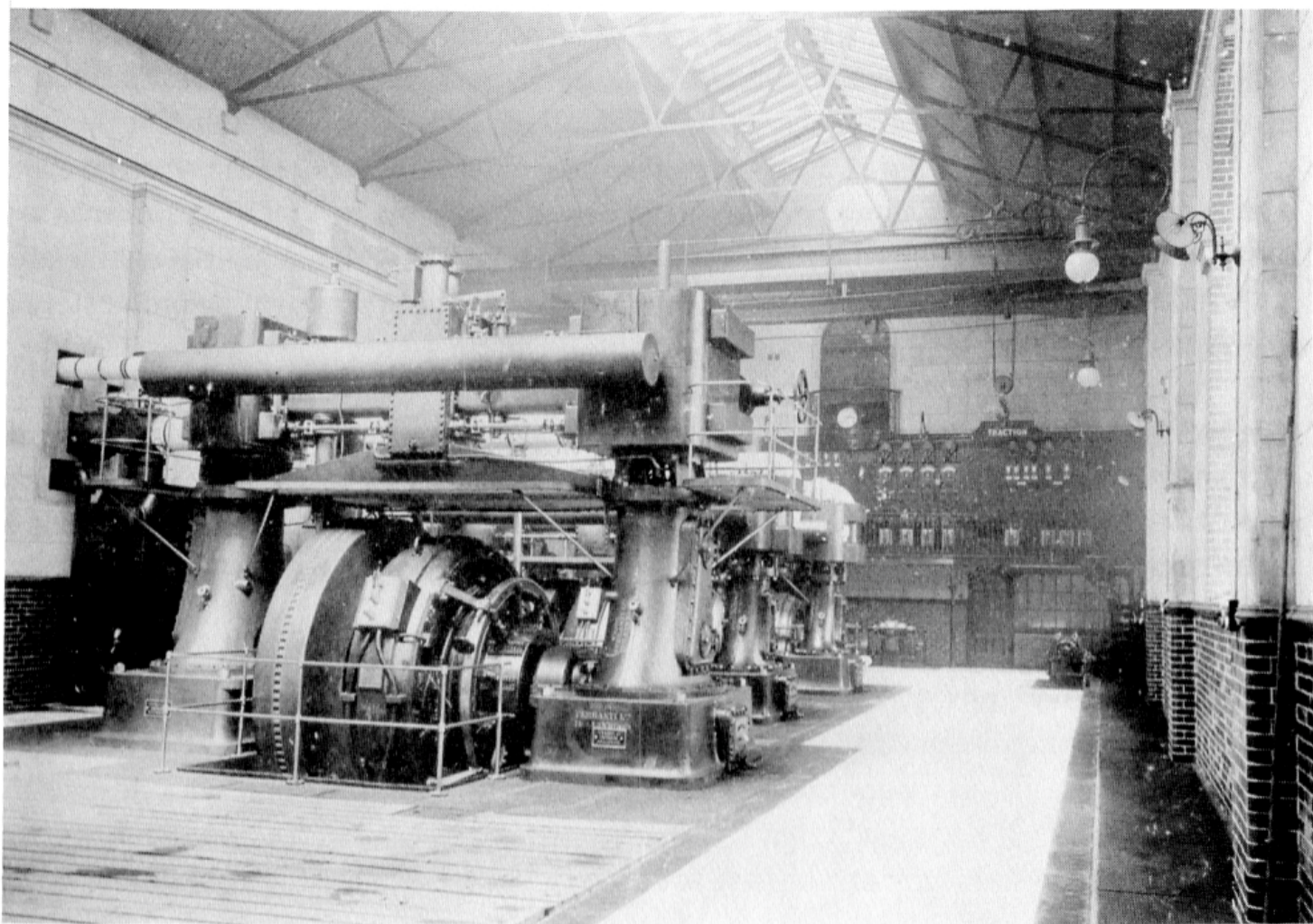
By May the Tramways Company had still not given any indication as to their likely current demand. The Engineer said that he would lay cables as he thought sufficient! A decision was made to erect two temporary wooden sheds over the traction plant at Newport Street; there had been many problems in clearing the site, and the construction of the building was not very advanced.

Eventually the foundation stone (or rather, memorial stone) was laid on 21st February 1901 by the Mayor, Harman J.H. Graves. * The Devonport and District Tramways were supplied with current from 26th June 1901, and the Plymouth, Stonehouse and Devonport Tramways were connected on 18th November 1901, although the Plymouth section of the latter was supplied from Prince Rock! A public supply was not inaugurated until 28th April 1902, and there were just 11 private consumers. Initially the Works consisted of one 150 KW generator for the DDT but by 31st March 1903 the capacity had increased to 1300KW.

There is no doubt that but for the pressure put upon the Corporation by the tramways companies the provision of electricity in Devonport and Stonehouse would have been further delayed. Indeed a private company tried to obtain a Provisional Order to set up a supply in the Urban District of Stonehouse but this was opposed. This undoubtedly reflected the slow progress being made by the Devonport Electricity Works in providing a street lighting system, especially in Stonehouse. In May 1902 there were just 21 public lamps, and these all in Devonport. In April 1904 there were 143 private consumers out of a population of about 70,000. In fact the townspeople were most aware of the electricity works by the smoke from the chimney, about which there were many complaints.

In Retrospect

And so two quite separate supply systems were set up in the Three Towns. And on the advice of the two consultants the Plymouth system was alternating current (a.c.) whilst the Devonport system was direct current (d.c.). In those early days of electricity each type of system had its advocates, and the 'battle of the systems' went on for several years. It was particularly unfortunate that Plymouth and Devonport should have chosen different systems, since only a few years later the Three Towns and their electricity departments were amalgamated. It was to be many years before Plymouth had a fully integrated supply system.



Internal View of Newport Street, Power Station

And yet this could have come about in 1890 if the proposals for the boroughs by the DCESCo had been accepted. With all the problems which Devonport experienced in finding a site for its power station, it would have been sensible for the Borough to have taken a bulk supply from the expanding Plymouth station as did most of the other surrounding districts. But here we have an example of how proudly independent the Devonport Corporation was.

*At the time of the lecture the Electricity Works building was still in existence but has since been demolished (1990) although the memorial stone has been preserved nearby. Adjacent to the Devonport Technical College exists a small building which was the first substation of the Electricity Works from where power to the various tramway sections was switched.

The works at Prince Rock were several times extended, and in 1935 the station was connected to the new National Grid. Eventually a new station was built in 1956, and the original station was closed and demolished in 1971. Its successor was likewise demolished in 1990, so that Plymouth has now no power station of it's own.