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SIR WILLIAM PREECE

by Peter Lamb

I have been following this gentleman for years. I first came across him when I was researching my first book "Bristol's Electricity History" in 1980. He was appointed as Consultant to Bristol Corporation Electricity Department in 1883 or 1884, surprisingly when he was also Chief Electrical Engineer of the GPO!

William was born in 1834 at Caernarvon in North Wales, the son of a banker, Richard Preece and Mayor of that town. However in 1845, Richard thought that there were few opportunities in North Wales for his large family of five daughters and three sons and decided to move to London. He entered William at King's College School at the age of 11. Richard's business activities took a turn for the worse and William was withdrawn from the School at 17 years remaining studying at home. During this time he visited the Royal Institution and listened to Michael Faraday's lectures and became hooked on electricity.

He got increasingly involved in the activities at the Royal Institution mixing with two Clark brothers, who had gained posts at the Electric Telegraph Company (ETC). So it was no surprise when William was appointed a clerk in the offices of the Company. Within weeks in 1853 he was appointed as an Assistant Engineer but was still involved with Faraday in the evenings with the Clarks in experimentation; particularly about finding a suitable insulating material for electric wires. They discovered Gutta Percha, a vegetable

gum from Malaysia, which was being used in other types of manufacturing at the time. During these early years mixing with Faraday and his assistants, William Thomson (later Lord Kelvin) would visit Faraday and had many conversations with Preece; being ten years his senior, he encouraged him in the ways of scientific analysis, chastising him for dismissing mathematics as an unimportant part of the study. In 1855 he took out his first patent of a duplex telegraph system for doubling the carrying capacity of circuits.

With only three years as an Assistant Engineer, he was promoted to Superintendent of the South Western District of ETC based at Southampton. During this time the Company allowed him also to be engineer to the Channel Islands Telegraph Company and the London & South Western Railway Telegraph system and seemingly allowed him to combine these responsibilities with those of the ETC. The first technical body he joined, was the Institution of Civil Engineers (ICE) to whom he gave lectures presenting papers on installing telegraph cables and was awarded the ICE Telford medal for one of his papers. In 1864 he married Ann Pocock and in the

next ten years they had seven children, including two boys, Llewellyn and Arthur who would both become engineers.

In 1851 the first telegraph cable was laid across the Channel to France, which heralded thoughts of a Cross-Atlantic Cable. Many attempts to lay a telegraph cable in the 1850's culminating in a major failure of the latest cable in 1858. Since the British Government had then been involved financially, they convened a special committee to consider the various aspects and Preece was called as witness.

During Preece's time in Southampton, he designed an instrument to aid railway signally using a semaphore, but also took out five patents for improving railway safety. His assistant at this time was WR Langdon, who later to become well-known in his post as Telegraph Superintendant for the Midland Railway.

In 1868 The Postmaster-General proposed taking over the Telegraph companies and introduced a bill "The Electric Telegraph Act 1868", which didn't have much clout so a second bill was promoted the next year, which involved the full take-over of all the Telegraph companies. So Preece became a Civil Servant working for the Post Office. The nationalisation of the Telegraph companies involved developing networks in remote rural areas involving a considerable capital outlay, which caused much anguish in Parliament.

Preece visited the USA in 1877 and acquires an operational sample of Alexander Bell's invention of the first telephone, which had been patented a year earlier. He also met Edison at the time. Later Preece did his own experimentation developing his own telephone system by 1892.

William Preece had joined the Institution of Civil Engineers previously and had presented many papers to that body, since it suited his work at the time.



A young Preece with Bell's Telephone

With his changing sphere of work it is not surprising that he joined the new Society of Telegraph Engineers. It held its first meeting in 1872 in London, when Dr CW Siemens was elected its first President. In 1874 his wife died having given birth to their seventh child, so he decided to move back to London, buying a property on Wimbledon Common, Gothic Lodge with his wife's sister Elizabeth looking after the seven children.

With Preece moving more into the electricity field, he was elected President of the Society of Telegraph Engineers in 1880 and in his address reviewed the theories of heat, light and electricity. The institution expanded its title to include Electricians in the next year and in 1889, changed to the Institution of Electrical Engineers. It was also a great honour that in 1881 he was elected as a Fellow of the Royal Society (FRS).

In 1882 with the new Electric Lighting Act, Bristol Corporation were quick to apply for an Electric Lighting Order and immediately asked Preece to be the Electrical Consultant. He was allowed by the Post Office to do this

outside work, which was a great surprise to some. He recommended a waiting policy due the many developments taking place in electricity generation, not least of these being whether to choose DC or AC!!



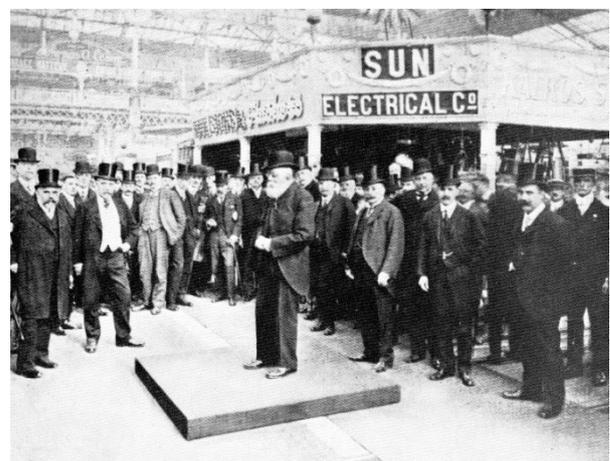
An older W. Preece then FRS

In March of that year Preece was asked to experiment with the phenomenon of conduction or leakage through the ground. This had first been noted by James Lindsay of Dundee who died 20 years earlier. Preece arranged telegraph lines from Southampton to Hurst Castle on the Solent and to Southsea Pier, Portsmouth where he planted electrodes in the ground and likewise on the Isle of Wight, Sconce Point and Ryde Pier and both connected by telegraph lines again to Newport. Telegrams were transmitted through the ground undersea across the Solent by buzzers operated by keys, using 30 Leclanche Cells. These experiments were repeated ten years later across the Severn Estuary.

Preece also acted as consultant to the Great Eastern Railway in the lighting of their London terminus. In the following year

Preece went at his own expense to an International Electrical Exhibition in Vienna getting involved in the British Pavilion with unpacking display artefacts sent across Europe in packing cases. His bosses were so pleased with his efforts, they paid his expenses. In 1884 Preece installed secondary batteries in his own house, since his staff were experimenting with batteries for use on trains, when the engine was disconnected losing the dynamo supply. At this time Colonel Crompton was installing many DC supplies for small towns and villages, being the main DC advocate in the UK.

In that year Preece went on a holiday to America with 200 other members of the British Association for their meeting in Montreal. Afterwards he travelled to Philadelphia to attend a convention of the American Institute of Electrical Engineers travelling onto Chicago St.Louis, Boston and New York. At each stop he analysed both the telegraph and electricity systems noting that in New York there were 32 separate companies supplying electricity and that there were 6 distinct lines of pole carrying wires down Broadway!! He was able to visit Edison, who personally gave him a conducted tour of his laboratories.



Preece addressing engineers at an exhibition

In June 1892 a Royal Commission was established to report on connecting lighthouses by telegraph following some tragedies. Preece's boss Edward Graves, Engineer-in-Chief was appointed as a member. Later that year Edward Graves died and Preece was appointed in his stead. At that time Preece was conducting experiments across the Severn Estuary, and being promoted to the top job gave him a problem with the title. He had been Graves assistant as The Electrician and wasn't keen on dropping that title; however he was allowed to add "and Electrician".

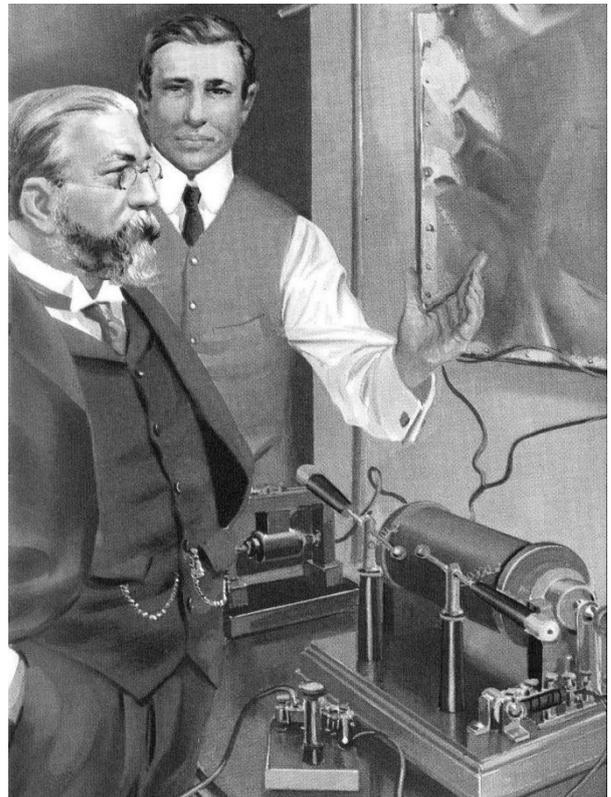
The Commission went on a sea journey visiting or passing the many Lighthouses disembarking at Scrabster in Scotland and going by train for the rest. During the course of the Commissions meetings, they produced five reports and the installations had been going ahead, such that by five years later 600 Coastguard and lifeboat stations and fifty lighthouses had been connected by telegraph or telephone.



Preece at 60

Nine years after visiting the US, Preece returned visiting Chicago for the World

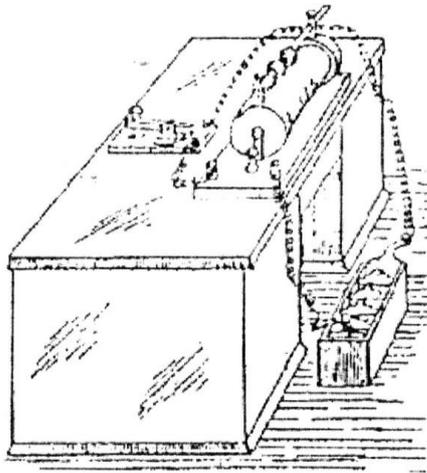
Columbian Exposition 1893 as representative to an International Electrical Congress to be held there. CW Siemens was in the chair then. Also in that year Preece was invited to give evidence to a Joint Committee of Lords and Commons on Electric Power protection Clauses and two years later was appointed to a committee on Electric Lighting Regulations with other well-known engineers such as Lord Kelvin and Major Cardew.



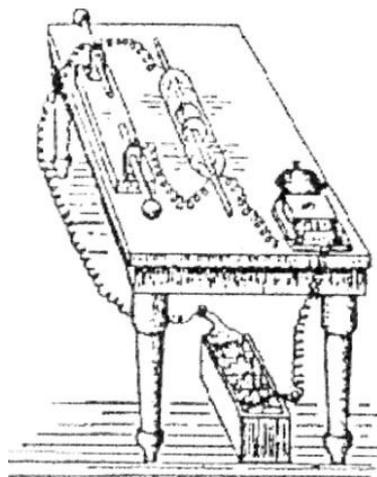
Preece with Marconi demonstrating his wireless system of communication

An interesting development happened a few years later when a slim young Italian was shown into the "great man's" office; he was of course Guglielmo Marconi, age 22 years. His mother, who was Irish, had got him an appointment. He showed Preece his equipment for passing messages through the airwaves. He set up his equipment on two tables; on the Chief's table he set up a key, sparking coil and brass balls in an antenna circuit, and on another he set up a coherer, bell and brass balls in an antenna circuit with

both apparatus operated from batteries. Immediately after the set up, Marconi pressed the key on the Chief's table and the bell rang on the other table. Preece was impressed and immediately arranged for his assistants to help Marconi in further experiments, but also getting some of the equipment improved.



Sending



Receiving

Marconi's Experiment in Preece's Office

Five experiments were held, first from GPO building to another building in Central London. Secondly Preece gave a lecture/demonstration with Marconi's assistance at Toynbee Hall. Further more expansive experiments were held on Salisbury Plain with the help of the army and across the Bristol Channel from Flat Holm to Penarth,

then 9 miles from Brean Down to Penarth and again on Salisbury Plain.

Whilst this was going on, Preece's career continued and doing consultancy work on the side. This was raised in Parliament in 1892, when an MP defended him saying that he was doing valuable service to the community and could command double the salary in private business. He was also defended by the Postmaster-General, Sir James Ferguson as "an expert of the highest standing" and that he had afforded considerable service in lighting the following – House of Commons, British Museum, Dublin Museum and many principal cities.



Preece's engineers at Flat Holm

Marconi was pretty sharp and gained a British patent for his invention in 1896 during these experiments. By 1897 Marconi had found financial backers and had established a company the Wireless Telegraph Company later changed to Marconi's Wireless Telegraph Company. He immediately offered jobs to some of Preece's staff. Over the next two years relationships became a bit strained, since Preece felt he had been used. It didn't help that Preece was unwell at the time and retired to his old home in Caernarvon periodically. Relationships became rather

strained, particularly with Marconi's company.

Over many years, the well-known inventor Oliver Lodge both clashed with Preece and at times worked together. Firstly they clashed over the design of earth rods in the safety of buildings against lightning strikes and cooperated later when Lodge designed a wireless telegraphy system with Alexander Muirhead testing their system in Liverpool, which they considered was better than Marconi's. Preece had designed his own system when Marconi went it alone, so Lodge sought his support. However when Lodge discovered that Marconi's had a designed a similar system to theirs in 1911, Lodge wanted to challenge Marconi's in the courts, but Preece cooled the situation from his semi-retirement home in North Wales by recommending a deal.

Over the last ten years before his retirement in 1899, he was a leading "light" in social activities in Wimbledon being President of a local society, the Wimbledon Literary and Scientific Society and giving lectures and parties at his large house Gothic Lodge.

Upon his retirement at the age of 65, he was awarded a knighthood. However he did continue in work for another five years as a Consulting Engineer. He set up a consulting business with a friend Major Philip Cardew of the Royal Engineers, who had become a well-known Inspector of the Board of Trade, who had considerable experience in telegraph and telephone systems. The firm was called Preece and Cardew with offices at No.8 Queen's Gate, London. Two of his sons joined the firm, Arthur and later his elder brother Llewellyn. Arthur became the senior partner advising electricity undertakings throughout the British Empire and eventually like his father receiving a knighthood.

Although retiring permanently to Caernarvon in 1904, he certainly didn't rest, constantly packing his cases for trips. Preece went to South Africa twice 1905 and 1911, the first trip was with members of the British Association, when they toured the whole of South Africa. The second trip involved work for his Consultancy, and he stayed for three months. In 1907 he went to America, where at Philadelphia University he was invested with a Doctorate of Law.

Whilst at Caernarvon, his friend Oliver Lodge wrote to him complaining that Marconi's were infringing his patents and asking for help in taking them to Court. Preece counselled him to do a deal to avoid litigation. He managed to get his son Llewellyn to make some tentative enquiries, culminating in Preece visiting the Marconi Office, when he happened to be in London in 1911 attending a dinner in honour of Alexander Siemens. In the Marconi Office, Preece laid the foundations of a deal, from which Lodge later took his advice.

His house in Caernarvon was called Penrhos and he had it fitted out with an electric lighting DC plant with a battery back-up presumably for use at night. His career achievements were recognised in North Wales with him being offered the Freedom of the Borough of Caernarvon. He joined many organisations in North Wales and was a delegate in Dublin of the Pan-Celtic Congress in 1901. He died at his house Penrhos in November 1913. What a full life he had led!

Main Reference :-

Sir William Preece FRS by E.C. Baker 1976
WPEHS National Library - Biographies