

## Victorian Innovators

### Joseph Swan 1828 – 1914

The young Joseph had an enquiring mind. With a keen interest in chemistry especially, he attended lectures at the Sunderland Atheneum, home of the Literary & Philosophical Society founded in 1834. Swan began conducting experiments in the conservatory of his large house in Gateshead. In 1850 he began working on a light bulb using carbonized paper filaments in a vacuum sealed glass bulb but stumbling blocks were obtaining a near perfect vacuum and the low resistance of copper.

Exactly one week before Christmas Day in 1878 Swan demonstrated his incandescent carbon lamp at a lecture to the Newcastle Chemical Society. After burning brightly for a few minutes the lamp failed due to excessive current. One month later he successfully repeated this and on 3 February 1879 gave a lecture in the lecture theatre of the Lit & Phil Society in the heart of Newcastle. This was the first public room in the world to have electric light. He continued to refine the efficiency of the process and bulb and installed electric bulbs in his own home. On 27<sup>th</sup> November in 1880 he received the first British patent. In the same year he installed electric light bulbs in the library of Cragside, home William Armstrong the president of the Lit & Phil Society. Cragside, near Rothbury north-west of Newcastle, was the first private home in the world to have its own electric lighting. In 1881 the Savoy Theatre in London became the first theatre to be lit. The creation of Richard D'Oyly Carte it had 1200 incandescent lamps that were powered by a 120 HP generator. On the opening night The Times reported, "a perfect view of the stage can be had from every seat in the house."

Meanwhile, Thomas Edison was developing a long-lasting incandescent lamp with ambitious large-scale usage in mind. Numerous inventors had demonstrated early prototypes of bulbs but flaws of short bulb life, expense and inefficiency meant commercial application was not viable. Edison filed a patent application which was approved on 27<sup>th</sup> January 1880. Edison's first successful test was on 22<sup>nd</sup> October in that year with the bulb lasting 13.5 hours. A few months later he discovered that a carbonized bamboo filament could last over 1200 hours.

The two electric lighting pioneers combined forces in Britain, forming the Edison & Swan Electric Light Company in 1883. Known as Ediswan the company soled lamps made with a cellulose filament that Swan had invented in 1881 whilst Edison continued to use bamboo in the USA. In 1892 General Electric began to exploit Swan's patents for cellulose filaments.

Joseph Swan also pioneered major advances in developing photographs by using dry plates and patented bromide paper still used for black and white prints. In 1864 he patented the transfer process for making carbon prints that allowed the full tonal range in reproduction. In 1894 he was elected a Fellow of the Royal Society and in 1901 was awarded a Doctorate by Durham University. Three years later he was knighted. A plaque to Sir Joseph Swan stands in Pilgrim Street in Newcastle outside the former Electricity Board building.