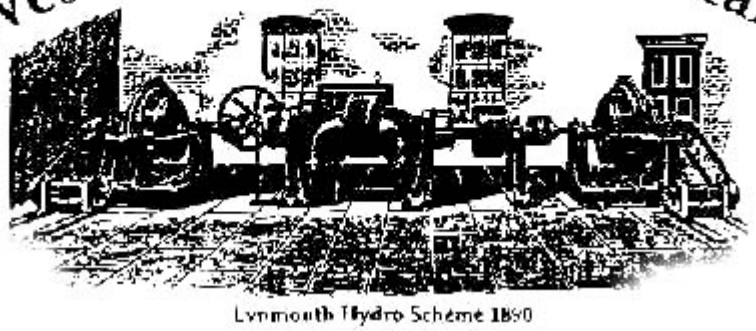
South Western Electricity Historical Society



Lynmouth Hydro Scheme 1890

The following document comes from the
South Western Electricity Historical Society website at
www.swehs.co.uk

This site contains all the necessary contact information you may require.

Do visit the site – you may find more items of interest.

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Sir Humphry Davy of Penzance - Man of many connections

by Bernard Melling

ELECTRICAL CONNECTIONS

Humphry Davy is most associated in many minds with the invention of the miners' safety lamp. As this produced its light by the flame from burning oil, his relevance to the proceedings of an Electricity Historical Society is not immediately obvious. His achievements were, however, very wide-ranging and included being the first to observe (in about 1802) that an arc of brilliant light is formed between two pieces of carbon connected to a high voltage electricity supply. This principle was further developed by many engineers throughout the 19th century until arc lamps were widespread in public buildings and open spaces in the early 20th century.

He used a powerful electric current from a battery to decompose compounds and was thus able to isolate and name several previously unknown elements including sodium, potassium, barium, strontium, and 'chlorine.

Before he was 20 he obtained his first scientific post, at the Pneumatic Institution at Hotwells, Clifton, Bristol which was newly founded and included a laboratory for Davy to investigate the value of using gases in treating diseases.

When he was 22 he was invited to direct the laboratory of the Royal Institution in London and to be their Assistant Professor of Chemistry. A year later he was made Professor of Chemistry and in the following year, 1803, he was elected Fellow of the Royal Society.

In 1820 he began his presidency of the Royal Society to which office he was reelected for seven successive years without opposition until failing health forced him to resign. During his presidency he was involved in the establishment of the Zoological Society of London and. of the financing of Charles Babbage's calculating engine.

He discovered that electrical conductivity is proportional to surface area over length but independent of cross-sectional shape, providing evidence that current passes through the interior of a conductor. He also found that the electrical conductivity of metals is lower at higher temperatures.

In 1807 he was awarded the Napoleon Prize of the Institute of France for important research in electricity.

THE SCIENTIFIC CONNECTIONS

Davy began his study of chemistry when he was 18 by reading Lavoisier's "Elements of Chemistry" - probably in the original French. Davy's own scientific work included research into the tanning industry and agricultural chemistry. His analysis of hydrochloric acid by electrolysis led him to the 'conclusion that chemical properties, such as acidity, is not determined by the presence of specific elements alone but by the ways that elements are arranged in molecules.

From Davy's initial work on the passing of currents through electrolytes sprang electroplating, electrolytic refining, and other operations of the electrochemical industry.

In 1813 he appointed a bookbinder's apprentice, Michael Faraday, as his scientific assistant. That same year he took Faraday on a European tour where they spent time in Italy with Alessandro Volta, whom Davy considered to be the greatest living light in

physical science, and in France he was given a sample of a substance by André Marie Ampère and Joseph Louis Gay-Lussac on which Davy experimented and was able to contribute to its identification and classification as iodine.

Although there were tensions in the relationship between Davy and Faraday at times, Faraday frankly acknowledged that his own greatest works were in large measure due to his association with Davy whom he regarded as his true master to the end of his days and of whom he would never allow it to be said that he had received any ungenerous treatment.

Despite having had reservations concerning Faraday's role in the Royal Society, Davy said some years later: "My greatest discovery was Faraday."

The Prince Regent created Davy a baronet in 1818, which made him the first scientist to receive that honour since Isaac Newton.

SOUTH WESTERN CONNECTIONS

Humphry Davy was born in Penzance in December 1778. He was educated at the local school of reading and writing and then from age 6 until 14 he attended Penzance Grammar School where he was not especially studious. 1793 was his final year of formal education and was spent at Truro Grammar School where he was reported to be good at Latin and Poetry although he showed neither extraordinary abilities nor any leaning towards scientific pursuits.

Davy left school just before he was 15. The following year his father died leaving his mother with debts of £1300 and 5 children of whom Humphry was the eldest. His mother, showing great courage and faith, moved house, started a millinery business in Penzance in partnership with a young refugee Frenchwoman, took in lodgers, and succeeded in paying off the debt and bringing, up her family. One lodger was Gregory Watt, son of James Watt.

With the financial help of a family friend the 16 year old Davy was apprenticed to a surgeon and apothecary in Penzance and followed a formidable programme of self-education not only in the fields directly -associated with medicine and pharmacy but including theology, ethics, logic, rhetoric, oratory, geography, history and 6 languages including Latin & Greek.

He remained in Cornwall until he was nearly 20 when he went to the Bristol area. During the rest of his life he made frequent visits to his family in .Cornwall. He left an endowment to the Penzance Grammar School (now Humphry Davy Upper School) to enable an annual gift to be made to the pupils.

His statue stands at the top of Market Jew Street in Penzance.

In 1824 he was honoured by the people of Penzance who provided a public dinner at which the mayor waited on him and of which this account was written: "Every heart, tongue and eye were as one to do honour to him who had not only rendered the name of their town as famous and imperishable as science itself, but who had added lustre to the intellectual character of their country and who is one of the happy few who can claim to be permanent benefactors to the human race".

LITERARY CONNECTIONS

Davy married a cousin of the novelist, Sir Walter Scott.

At Clifton, and in the Lake District, Davy enjoyed friendship with the poets, Robert Southey, Samuel Taylor Coleridge, and William Wordsworth. Coleridge greatly admired Davy and loved to watch him work when he was in Bristol. He attended Davy's lectures in

order to increase his own stock of metaphors~

In the following extract from one 'of Davy's own poems, "Sons of Genius", written when he was only 17, published in an anthology edited by Southey in Bristol in 1799 his early eagerness for scientific discovery can be seen:-

While superstition rules the vulgar soul,
Forbids the energies of man to rise,
Raised far above her low, her mean control,
Aspiring genius seeks her native skies.

Inspired by her, the sons of genius rise
Above all earthly thoughts, all vulgar care;
Wealth, power, and grandeur, they alike despise,
-Enraptured by the good, the great, the fair.

To scan the laws of nature, to explore
The tranquil reign of mild philosophy;
Or on Newtonian wings to soar
Through the bright regions of the starry sky.

From these pursuits the sons of genius scan
The end of their creation, - hence they know
The fair, sublime, immortal hopes of man,
From whence alone undying pleasures flow.

UNDERGROUND CONNECTIONS

Following a large number of deaths of miners in explosions caused by the lighting of mines by naked flames a Society to address the problem was founded under the patronage of the Bishop of Durham, who like his famous successor, stood alongside miners in their difficulties. The Society contacted Davy for his help and within a few weeks Davy, who had gained a great appreciation of a miner's life from his boyhood amongst the Cornish tin mines, had solved the problem with his invention of a modified oil lamp which, instead of a glass chimney, used fine wire-gauze around the flame which allowed enough illumination for the miners to work by and conducted away the heat of the flame so that the explosive gas was not ignited.

Upon being urged to patent his invention which could then have made £10,000 a year for him, he wrote: "... my sole object was to serve the cause of humanity; and if I have succeeded, I am amply rewarded in the gratifying reflection of having done so ...

More wealth could not increase either my fame or my happiness. It might undoubtedly enable me to put four horses to my carriage; but what would it avail me to have it said that Sir Humphry drives his carriage and four?"

In appreciation, the colliery owners of Tyne and Wear presented Davy with a service of gold plate costing £1200 (£48000 today) and said "... you have contributed to the safety of the lives and persons of multitudes' of your fellow-creatures. Long may you live to pursue your splendid career of scientific discover, and to give new claims to the gratitude and praise of the world.

He lived for 12 further years of pioneering work in science and died, aged 50, at Geneva, In accordance with his will, he was buried at the place where he died.

Soon after Davy's death Dr Henry wrote in his preface to "Elements of Chemistry": "Davy was a master of the practice of the inductive logic; and he has left us some of the noblest examples of the efficacy of that great instrument of human reason in the discovery of math. He applied it not only to connect classes of facts of more limited extent and

importance but to develop great and comprehensive laws, which embrace Phenomena that are almost universal to the natural world. In explaining these laws, he cast upon them the illuminations' of his own clear and vivid conceptions; - he felt an intense admiration of the beauty, order and harmony which are onspicuous in the perfect chemistry of Nature; and he expressed these feelings with a force of eloquence which could issue only from a mind of the highest powers and of the finest sensibilities?'

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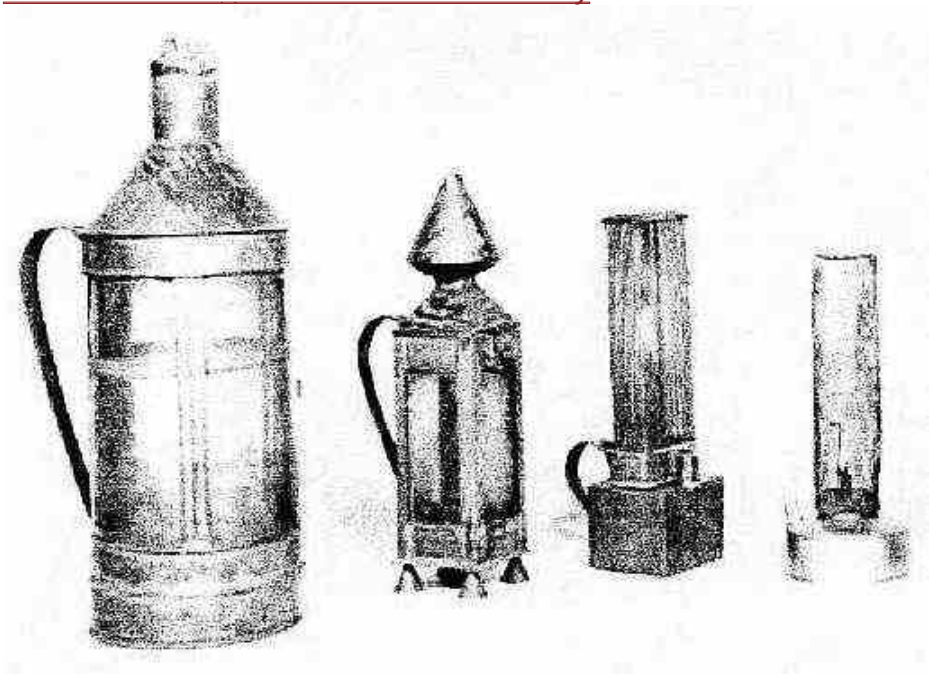

Early Miners Davey Lamps

Some of Davy's own experimental models of the Miners' Safety Lamp