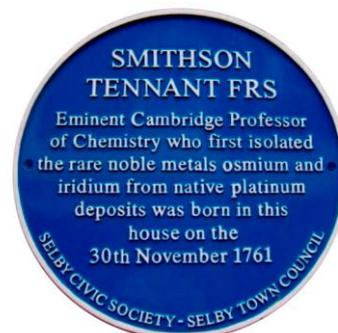


Smithson Tennant FRS 1761 – 1815 : Discoverer of Elements

From a side street in Selby to membership of the Royal Society, a confidante of famous scientists of the early 19th century, a European traveller and discoverer of two elements in the Periodic Table.

Tennant was born in Finkle Street on November 30th 1761. The house still exists, now being licensed premises called 'J T Mellanby's'. The siting of the plaque owes much to the research of the Civic Society's Phillip Milsom who sought and consulted original documentation to establish that Tennant was indeed born at what is now 12 Finkle Street.



Early life

The blue plaque to Tennant in Finkle Street

Tennant's parents were the Rev Calvert Tennant a graduate of Cambridge who assisted with services at the Abbey and at Brayton Church and Mary Daunt, daughter of William Daunt, an apothecary of the town. Both families were relatively well-off, with Calvert's family linked to land and the clergy in Wensleydale and Wharfedale and Mary's family being associated with political leadership in Pontefract, and land and influence around Gargrave. The unusual first names stem from the practice of recording a maternal grandparent's family name. Calvert's maternal grandmother was Phyllis Calvert, and Smithson's was Rebecca Smithson.

After education at Scorton, Tadcaster and Beverley Grammar Schools, Tennant went up to Cambridge to study medicine. He was already well known for his scientific endeavours, having made gunpowder for his own amusement before he was 10, and attempted to focus



Tennant's house in Finkle Street in 2012

moonbeams to melt butter whilst at Beverley. His scientific prowess was so great that it was planned that he should study under Joseph Black, the famous physicist at Edinburgh, but family tragedy prevented that.

During the 1770s, both Smithson's parents and grandfather William died. As an only child this left him somewhat isolated, but also paved the way for the rest of his life. He inherited money and property in Selby, and by gradually selling off his Selby possessions, Tennant had sufficient money to do what he wished for the rest of his life.

Development of a scientist

The late 18th century was the era for discovery of chemical elements. Over 30 were found during Tennant's lifetime. As well as studying at Cambridge, he toured Europe, visiting many of the famous European chemists, including Gahn, Scheele and Berzelius. Tennant was famed for the quality of his practical work, and his experiments on carbon dioxide and diamond helped to

prove Lavoisier and Priestley's separate ideas of the formula of carbon dioxide and the dual nature (allotropy) of carbon. This work convinced the Royal Society – England's foremost scientific body – to award him a fellowship at the remarkably early age of 23. Modern scientists such as Hawking haven't achieved "FRS" status until much later in life.

Tennant then turned his mind to agriculture, finding a cure for soil acidity, so helping Yorkshire farmers increase their yields. Having qualified as a doctor he decided not to take up the profession as he couldn't stand the sight of people in pain. Instead he formed a partnership with William Hyde Wollaston in a platinum-producing business. As a result of purifying platinum ore, in 1803/4 both Tennant and Wollaston discovered new elements. Wollaston's were rhodium and palladium, Tennant's iridium and osmium. These two metals are even less reactive than platinum and are the densest metal elements on earth, being three times denser than iron. Tennant was awarded the Royal Society's Copley Medal - effectively equivalent to the Nobel prize - for the quality of this research.

The metals are used today in catalytic converters, high quality spark plugs, rocket nozzles and as the cases of exclusive watches designed by Harry Winston - as mentioned in the song "Diamonds are a girl's best friend"



Crystals of metallic osmium (courtesy of CrystalTech)

Instead of remaining in the valuable metal trade, Tennant returned to touring Europe, took an interest in far-Eastern culture, the politics of Napoleon, the new science of Geology and the study of meteorites. Returning to London in 1810, he was the lead scientist in investigating the cause of a huge gas explosion, and, as a result of his researches, the principle that allowed Davy to invent the miners' safety lamp was outlined.

Tennant got to know Davy quite well, and was able to prove that iodine was another new element, by improving on Davy's research work. Unfortunately, Tennant did not publish this work, so Davy got the credit.

Tennant was now hugely respected and was elected Professor of Chemistry at Cambridge University in 1813. His initial lectures were very well received, and the audience included Charles Babbage, the computer pioneer.

Tennant went to Paris for the winter of 1814/15, intending to return for a further series of lectures in 1815. Sadly in February, he was involved in a fatal accident when visiting a monument to Napoleon at Boulogne, and is buried in the town cemetery there.

An extract from his obituary read

"Mr Smithson Tennant was a profound philosopher and a matchless companion. His learning was without pedantry and his wit without sarcasm. He was deep but always clear, gentle but never dull."

Taking it further

There is an 8-minute YouTube clip on Tennant's discoveries if you visit Martyn Poliakoff's 'Periodic Table' YouTube feed.

A more detailed biography "Smithson Tennant: Selby's Scientific Genius" is available at Selby Library

Papers on Tennant's life by, separately, MacDonald, Griffiths and Lewis can be found via Johnson and Matthey's "Platinum Metals Review" website.

Dr AE Wales produced a doctoral thesis on Tennant in 1940. Although unpublished, this can be accessed by prior appointment at Leeds University's Brotherton Library. An extract from this was published in the December 1961 edition of 'Nature'.

The place of iridium and osmium in platinum group metals, along with a chapter on Tennant and Wollaston, is covered in McDonald and Hunt's book "History of Platinum and Allied Metals"

Tennant is a common name in Wharfedale and Wensleydale and members of the Upper Dales Family History Group have traced the Tennant lineage back to the 16th century.

Tennant's name is noted in Selby by 'Tennant Street' on the Charles Street estate. Ironically it is an area of land once owned by Tennant.

A copper and arsenic crystalline ore is named tennantite in Tennant's honour. It is occasionally used in jewellery. It was first described in Cornwall in 1819 and is found in Namibia and Mexico

Despite the fact that Tennant knew many artists when he lived in London, he expressly forbade anyone to draw his portrait. Online images that claim to be of Tennant are either of James Smithson (of Smithsonian Institute fame, and no relation), or Earl Grey, a distant forebear.

Wishaw's obituary appreciation of 1815 in the Gentleman's Magazine is a comprehensive description of Tennant's life.

There is a heavy metal band named Osmium - who are very heavy indeed!