

From Porcelain to Ytterbium: On Rörstrand Castle and Ytterby Mine

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On June 13, 1726, an agreement was signed which allowed production of porcelain in Sweden “as it was made in Delft”. This agreement, which refers to a Dutch imitation of porcelain called faience allowed a German alchemist, Johann Wolff, to establish a porcelain factory in the cellar and wings of Stora Rörstrand, a castle built by the nobleman Mårten Wewitzer using bricks from Lilla Rörstrand, his own brickyard which dated back to the 11th century, when it was run by the eminently capable Clara nuns. Sixty-two years after the agreement was signed, Reinhold Geijer, a chemist and mineralogist and then owner of what had become Rörstrand porcelain factory, published a letter (Geijer, 1788) describing a heavy black non-magnetic mineral which had been found in the Ytterby mine by an amateur geologist, Carl Axel Arrhenius. The mineral, a sample of which had also been sent to Johan Gadolin, professor at Åbo Academy, was later called gadolinite.

Gadolinite was found to contain oxides of aluminium, iron and a hitherto unknown element. In a paper published in 1794 (Gadolin, 1794), Gadolin hinted that this unknown element was in reality a mixture of several elements, none of which were known. Three years later, Anders Gustaf Ekeberg, a chemist from Uppsala, called the oxide “ytterjord” meaning “yttria” (Ekeberg, 1797), from which Friedrich Wöhler in Berlin isolated yttrium in 1828. Gadolin’s suspicions that “yttria” was actually a mixture several oxides was verified by Carl Gustaf Mosander in 1847. Based on wet chemistry, he showed that “yttria” was a mixture of 3 oxides, the others of which were oxides of terbium and erbium.

With the advent of spectroscopic techniques, Jean de Marignac in Geneva, found that what had been called erbium was actually a mixture of 2 elements, the other being ytterbium. In the early 1900s, Carl Auer von Welsbach in Vienna and Georges Urbain in Paris found, within weeks of one another, that ytterbium too was a mixture of 2 elements. Both Auer von Welsbach (1907) and Urbain (1907) attempted to claim not only one, but both new elements by proposing new names for both of them. Welsbach’s proposal was aldebaranium and cassiopeium, and Urbain’s was neo-ytterbium and lutecium. Urbain’s attempt to re-name ytterbium was unsuccessful. However, the name, lutecium, which he proposed gained favour of the International Committee on Atomic Weights over the names put forward by Welsbach (Clarke, 1909). If this had anything to do with the fact that Urbain ended up chairing the committee remains a mystery (Skelton & Thornton, 2017).

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