# Wilhelm Prandtl and Europium

A postcard addressed to W. Prandtl (Fig. 1). Could it also have been addressed to the chemist Wilhelm Prandtl (1878 - 1956)? Wilhelm Prandtl was indeed working in Munich at the time. Some facts about Wilhelm Prandtl[1]:


Fig. 1

- He studied chemistry from 1897. He completed his studies in 1901 with a dissertation: Über einige neue Bestandtheile des Euxenits. Euxenite (Fig. 2) is a solid solution of the general formula (Y, Ca, Ce, U, Th)(Nb, Ta, Ti)2O2. It contains the rare earth elements (= lanthanides, old designation: lanthanides) in varying proportions: Cerium (= Ce). It also contains the radioactive actinides: uranium (= U) and thorium (= Th).


Fig. 2

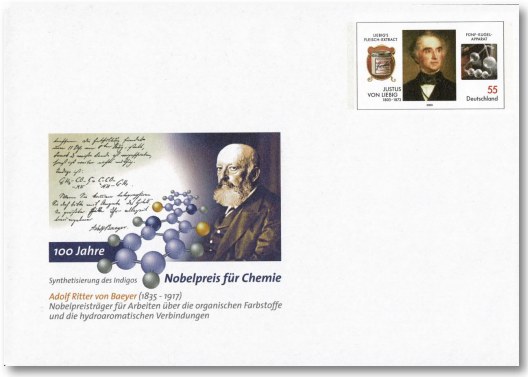
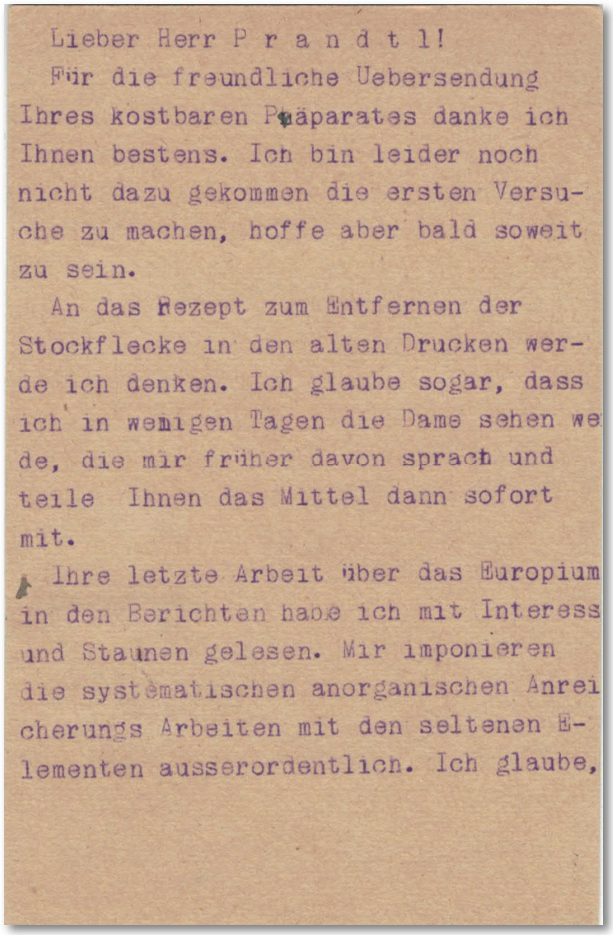



Fig. 3

- He habilitated in 1906 under Adolf von Baeyer (Fig. 3) in Munich and became a private lecturer and later an associate professor of inorganic chemistry. From 1911 to 1937 he worked on lanthanides. With a brief interruption between 1917 and 1918, when he researched poison gases with Fritz Haber (Fig. 4).


Fig. 4

[1] Editor's note: not to be confused with Ludwig Prandtl, his cousin, the "father of modern aerodynamics". The latter was an outstanding international figure in physics. However, he undoubtedly belonged to the functional elite of wartime research in the power structure of the Nazi regime and also showed a decidedly anti-Semitic attitude, which is why, for example, TUM Munich renamed lecture halls in 2024 and had his name removed.



Lieber Herr P r a n d t l!
Für die freundliche Uebersendung Ihres kostbaren Präparates danke ich Ihnen bestens. Ich bin leider noch nicht dazu gekommen die ersten Versuche zu machen, hoffe aber bald soweit zu sein.
An das Rezept zum Entfernen der Stockflecke in den alten Drucken werde ich denken. Ich glaube sogar, dass ich in wenigen Tagen die Dame sehen werde, die mir früher davon sprach und teile Ihnen das Mittel dann sofort mit.
Ihre letzte Arbeit über das Europium in den Berichten habe ich mit Interesse und Staunen gelesen. Mir imponieren die systematischen anorganischen Anreicherungs Arbeiten mit den seltenen Elementen ausserordentlich. Ich glaube,

Fig. 5

1947) (Fig. 5). Weigert was also a chemist, specializing in photochemistry (the influence of light on chemical reactions). He wrote: *I read your last paper on europium in the reports with interest and amazement. I am extremely impressed by the systematic inorganic enrichment work with the rare elements. I believe that I would never get very far with it.*

• In 1935, he was to be appointed full professor, but this did not happen as his wife was of Jewish descent. For the same reason, he was forced into retirement in 1937. During this time, he worked on the history of chemistry, for which he did not need a laboratory[2].

Back to Wilhelm Prandtl's original field of research. Contrary to what their name suggests, rare earths are not so rare on earth. Gold, silver, platinum and copper are in some cases much rarer. The term "rare earths" is very misleading; the (current) term "lanthanides" is better.

Lanthanides are chemically very similar. It is therefore difficult to separate them from each other. It does not help that they often occur together in rocks. The purification of lanthanides is a major challenge, as crystals used to be carefully cultivated for this purpose. But to get them really pure, this process had to be repeated several thousand times! Not a task for a Friday afternoon, as it could take years to purify a particular metal. Prandtl studied this process extensively and perfected it.

So Prandtl did a lot of research on lanthanides. In this context, it is interesting to note the information provided by the author of this postcard, Fritz Weigert (1876 -


Fig. 6

[2] Editor's note: In 1946, he was again appointed professor emeritus and chair of the Department of History of Natural Sciences at the University of Munich. He took his own life in 1956.

The aqueous solutions of lanthanide salts exhibit a broad color spectrum. These properties are used today in lighting elements. Our modern televisions (plasma screens, Fig. 6) would be inconceivable without europium-containing (= Eu) materials to display the red and blue colors. Eu is also used in the control rods of nuclear reactors. And as long as everyone has a euro in their pocket, they also carry Eu with them: our euro banknotes contain a little Eu for fluorescence as a weapon against counterfeiting (Fig. 7)!


Fig. 7

Sources:


- Europium beveiligt de Euro – F. Suyver en A. Meijerink, Chemisch2Weekblad 4, 16 feb. 2002, blz. 12-13
- Wikipedia.org