A trip down memory lane in the Chemistry lab

You may remember using one of these in the Chemistry lab, back in the Olden Days.

It is a **Liebig condenser** for cooling hot vapour so that it turns back to liquid.

But who was this "Liebig"? Answer: one of the great unsung heroes of science, sometimes fittingly commemorated on stamps.

Justus von Liebig (1803 – 1873) was responsible, not just for his condenser, but for virtually inventing the **laboratory**-based teaching of Chemistry. So, it is his fault that your school had a Chemistry lab at all.

[Stamp: GFR 1953, marking 150 years since Liebig's birth in 1803]

Universities had no labs in their chemistry departments at the time, which were often a part of the philosophy faculty.

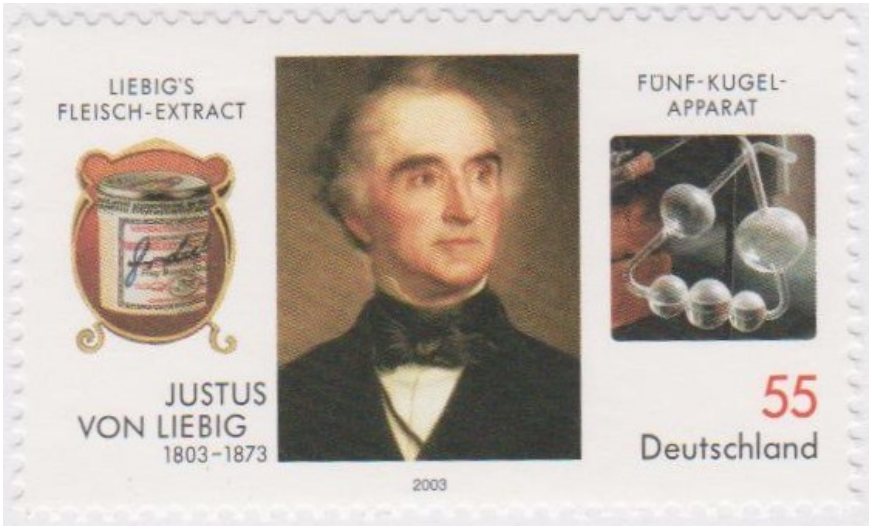
So, Liebig's first experience of practical chemistry was in the personal lab of Joseph **Gay-Lussac** in Paris, under whom he studied for a PhD.

Gay-Lussac is best known for the discovery of the formula of water – **H_2O**.

[Stamp: France1951, marking 101(!) years since Gay-Lussac's death in 1850, plus 3f for the post-war National Relief Fund.]

On appointment as Professor of Chemistry at **Giessen** university in 1824, Liebig established its first teaching laboratory in the guardroom of a disused barracks on the outskirts of town. From 1825 onwards he lived with his family in flat over the lab, which attracted doctoral students from the USA and UK.

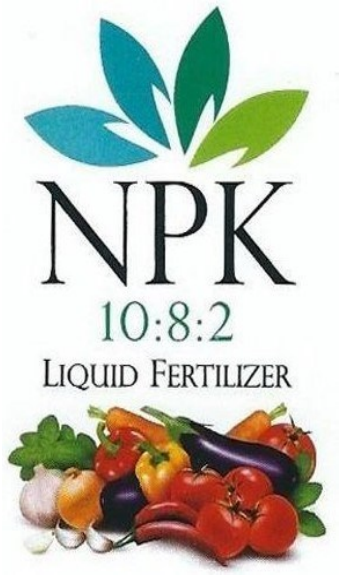
One of Liebig's major inventions was the ***Kaliapparat***, an apparatus for measuring the percentage of carbon and hydrogen in **organic molecules** and therefore for determining their **formulae** (such as $C_6H_{12}O_6$ for glucose).



[Stamp: GFR 2003, marking 200 years since Liebig's birth in 1803]

It involved burning a weighed sample of the mystery substance and catching its **hydrogen** as water (H_2O) in anhydrous calcium chloride and its **carbon** as carbon dioxide (CO_2) in potassium hydroxide solution. The calculations involved are still examined in GCSE science today.

Even more important was his unsung contribution to agricultural chemistry. At this time, it was a mystery where **plants** got the **nutrients** they needed for growth. Liebig discovered that plants absorb their **nitrogen** as **n**itrate ions (NO_3^-), **phosphorus** as **p**hosphate ions (PO_4^{3-}) and **potassium** as potassium ions (**K**$^+$) from the soil – the basis of the **NPK** artificial fertilizers beloved of gardeners, allotment-holders and farmers today.



Liebig's main commercial enterprise is, however, familiar to us all. Having developed a formula for beef extract, he founded **Liebig's Extract of Meat Company** (LEMCO) in **Fray Bentos**, Uruguay in 1863.

The factory was for years the largest industrial complex in South America and is today a World Heritage Site.

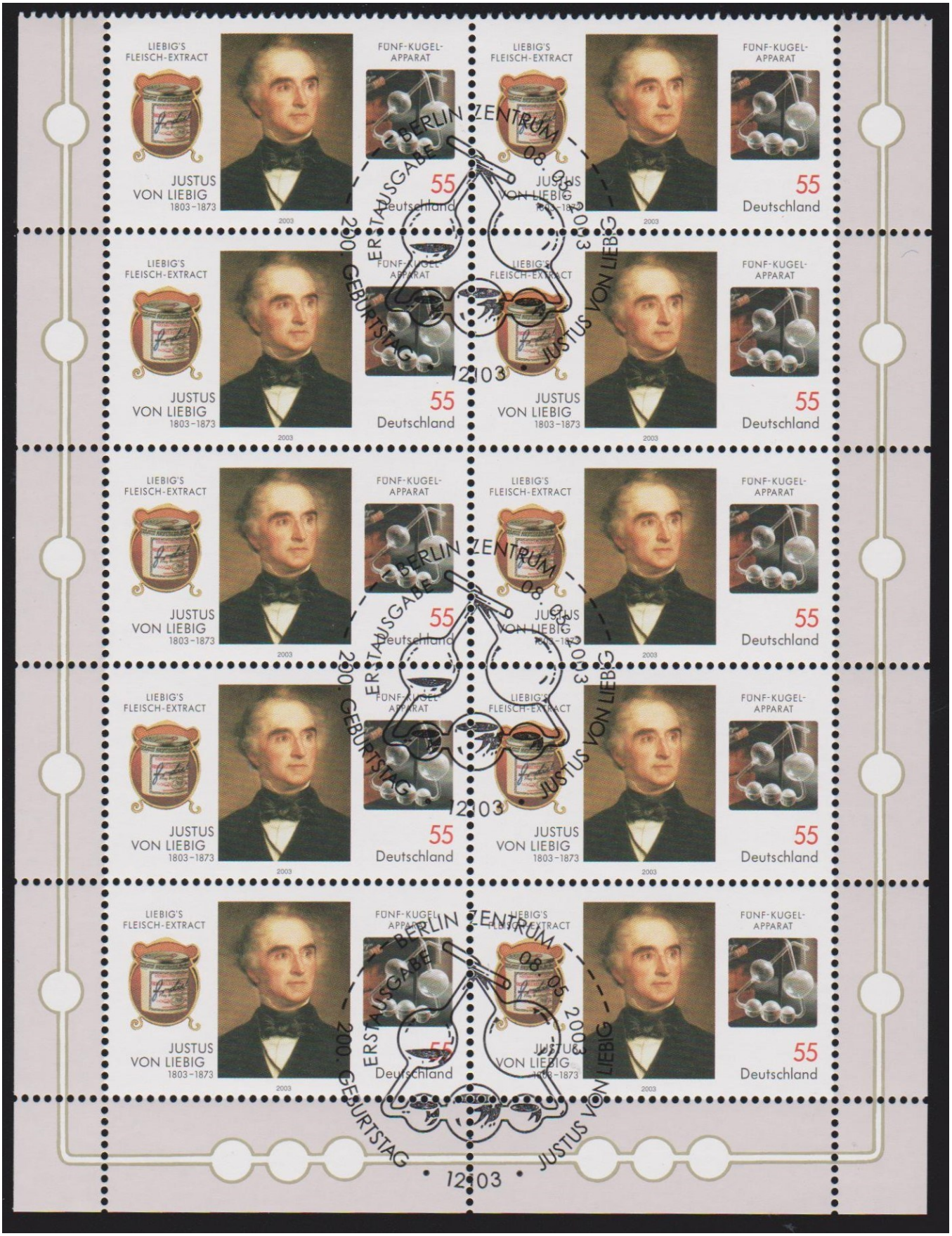
[Stamp: Uruguay 2009, marking 150 years since the founding of the town in 1859.]

The company initially promoted their "meat tea" as a nutritious and cheap alternative to real meat. Later it cooperated with English chemist Henry Roscoe to develop the related product **OXO**, released as a solid cube in 1911.

LEMCO bought the **OXO Tower** on the South Bank in the 1920s, converting from a power station into a cold store for the liquid beef extracts.

Liebig is fondly remembered in his native Germany, where Chemistry is highly valued as a discipline. His University of Giessen was re-established after the devastation of WWII as the **Justus Liebig-Hochschule** for agriculture and veterinary medicine, and it was re-accorded university status in **1957**.

[Stamp: GFR 1957, marking 350 years since the founding of the university at Giessen, and its re-establishment as a university after WWII.]


LIEBIG'S FLEISCH-EXTRACT
FÜNF-KUGEL-APPARAT
JUSTUS VON LIEBIG
1803–1873
2003
55
Deutschland
BERLIN ZENTRUM
08.05.2003
ERSTAUSGABE
200. GEBURTSTAG
JUSTUS VON LIEBIG
12.03