

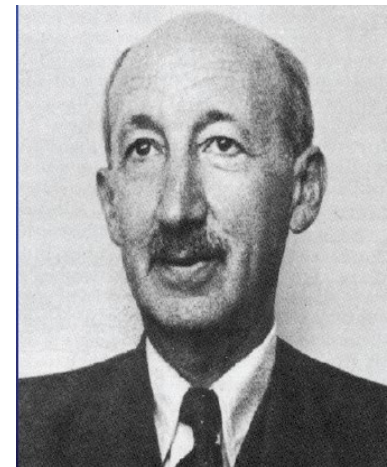
Discovery of tracer principle

(open-end summarizing discussion)



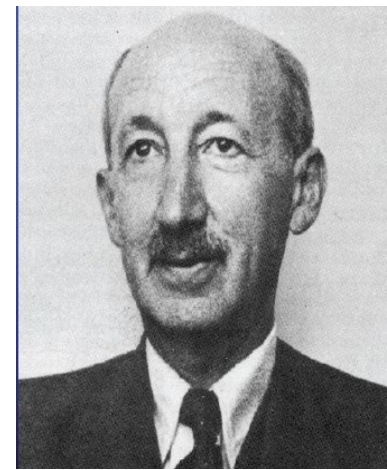
Learning objectives:

- Radioactive decay, its law, half-time concept
- Alpha-, beta-, gamma- interaction with matter



G. Hevesy

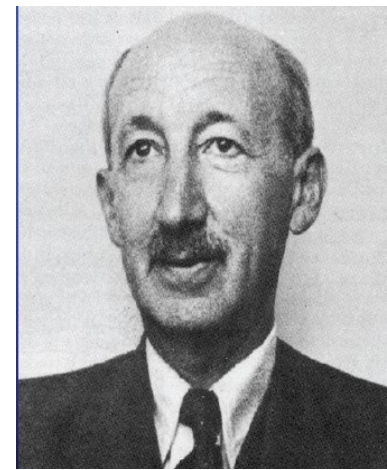
Father of Nuclear Medicine
(Nobel Prize 1943)



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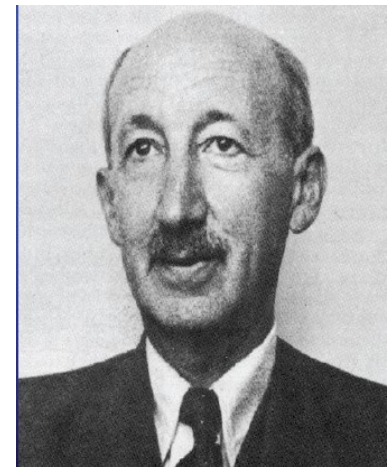
“A Hungarian Nobelman, G. Hevesy, during his stay at Manchester, was distinctly unhappy with the boardinghouse he stayed at. He was sure that landlady had a nasty habit of recycling food. His suggestion that she serve freshly prepared meat more than once a week was met with indignation - how could he?! But Hevesy wasn't persuaded. The following Sunday, Hevesy secretly spiked the leftovers on his plate with radioactive material. A few days later, the electroscope he smuggled into the dining room revealed the presence of the tracer - radioactive hash! Confronted with the irrefutable evidence, all the landlady could do was exclaim "this is magic!" The first radiotracer investigation had successfully followed leftover meat from the Sunday meal to the kitchen meat grinder, into the hash pot, and back onto the dining room table. To this day, it is doubtful if a successful radiotracer study has provided greater personal satisfaction!”



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- What type of radiation could be used by Hevesy?
 - Which half-times $T_{1/2}$ could this element have that we can see it in 12 hours?
 - Which nuclei would you use (Propose some elements based on table of isotopes)
 - Was this radiation dangerous for anyone during “recycle” path?
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How would you propose to use this method today?
(or anything you know about its usage already)

Some helping info for TAs

- It was Pb-210 (one could come up with something else now)
- (Occurs in natural chain of U-238)
- Half-life ~22 years
- Mainly beta-decay (accompanied by gamma), then further chain

For explanation of half-time:

