

# The deeds to deuterium

Dan O'Leary examines Harold Urey's decision to name the mass-2 hydrogen isotope 'deuterium'.

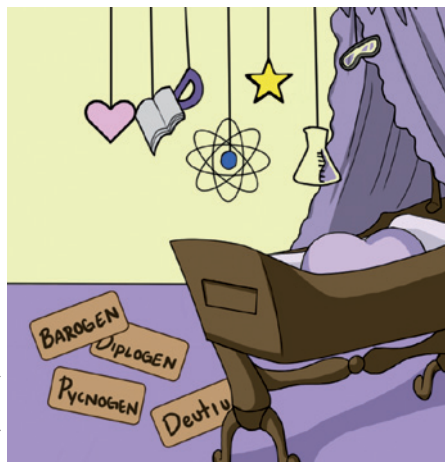
Harold Urey discovered the Nobel-worthy mass-2 hydrogen isotope in 1931, and is generally credited with naming it deuterium in June 1933 (ref. 1). Correspondence<sup>2</sup> between Urey and his collaborator Ferdinand 'Brick' Brickwedde reveals, however, that as late as May in that year the team was still struggling to find an acceptable name for the isotope.

On 9 May, Urey wrote to Brick to say that he was very much undecided as to what to call 'the hydrogen'. Pycnogen, barhydrogen (H̄) and barogen had all been suggested, but he was not enthusiastic about any of them. Instead, Urey asked Brick what he thought about pycnogen as a suitable name for 'H<sup>2</sup>'. Just over a week later, Brick responded to say that he preferred barhydrogen, but barogen and pycnogen were acceptable. He then muddied the water by also suggesting haplogen or haplohydrogen and diplogen or diplohydrogen.

Urey acknowledged Brick's letter on 23 May and wondered if protium and deutium might work. He revealed an ongoing correspondence with Gilbert N. Lewis, Urey's former doctoral advisor who had privately proposed the name dygen and with whom Urey had shared the names pycnogen and barogen. Urey shared the content of a telegram from Lewis:

PLEASE DISREGARD SUGGESTION IN MY LETTER NO ONE LIKES THOSE NAMES NOR DO I STOP HAVE TEMPORARILY ABANDONED ATTEMPT TO FIND NAME FOR THE ISOTOPE AS A SUBSTANCE STOP HOWEVER FOR THE NUCLEUS OF HYDROGEN ISOTOPE WE ALL THINK THAT DEUTON IS BEST NAME AND ARE USING IT PROVISIONALLY

Urey continued, "I took my time about answering this and wrote him a letter by ordinary mail, a copy of which I enclose. I hope G. N. gets the point to this for he seems to consider it a duty to find a good name for this isotope." He then wrote, "The thing



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I have against this is the fact that Lewis suggested the name. I am getting to a point where I wish they would stop suggesting names so that I would not feel prejudiced against any of them."

In his reply on 26 May, Brick said that he found protium and deutium acceptable. Haplogen and diplogen he still liked, but were losing ground because they had been suggested by a colleague. On 29 May, Urey wrote back to say "The more I think about names for the hydrogen isotopes, the more I lean towards the use of protium and deuterium (our Greek experts tell us that deutium would not be a suitable word derived from Greek). In case a H<sup>3</sup> isotope is discovered, it can be called tritium."

Brick wrote back on 4 June to say that proterium and triterium were more euphonious but that protium, deuterium, and tritium were agreeable. Urey responded on 6 June: "I am not entirely satisfied with the names protium and deuterium, but I cannot think of anything better. You would prefer proterium to protium, and I have a letter from G. N. Lewis expressing the feeling that deutium would be better than deuterium; in fact, he would prefer protum and deutum."

Urey's team published a letter to the editor in *Journal of Chemical Physics* on 15 June proposing the names protium, deuterium and tritium<sup>3</sup>. They cited Lewis'

personal communication regarding the nuclear deuton, but reject the proposal because it is not a fundamental particle. If a nuclear name was necessary, Urey and co-workers suggested deuteron as more desirable. These names survived a brazen attempt (published<sup>4</sup> in *Nature* and endorsed by Lord Rutherford) in early 1934 by a UK-based group to name the isotope diplogen. *Time* magazine even reported<sup>5</sup> on the dust-up, calling it a source of 'very tense' transatlantic scientific relations. Urey and his cohorts responded, essentially saying 'thought of it, tried it, and it doesn't work.'

For his discovery of deuterium, Urey was named the sole recipient of the 1934 Nobel Prize in Chemistry. Lewis, despite furiously publishing his own work on heavy water, was passed over. He reportedly never recovered from this — and other perceived slights — and died in 1946, possibly by his own hand<sup>1</sup>. Urey later wrote<sup>6</sup> of his advisor's role in the deuterium hunt: "I have always felt badly about Professor Lewis' attitude in this matter. I have tried in the years since then, whenever my former students make an important discovery, to help them as much as possible rather than to try to take the subject matter away from them."

Would Urey's team, working alone, have conjured a name based on the Greek *deuteros*? This question is answered by Urey's own grudging admission to Brickwedde, that it was Lewis who suggested the root of the eventual name. □

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## References

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