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Ghosts, gases and the Mouse's Petition

by Freddie Theodoulou, Science Editor



It's hard to watch a kettle boil without thinking about states of matter. Or is that just me, and most folk simply anticipate a hot cup of tea? Either way, I think it's fair to claim that most school children understand that water forms a solid when cooled and a gas when heated. Thanks to to celebrity chef Heston Blumenthal, we're also pretty well

acquainted with liquid nitrogen and dry ice, if only as novelty ingredients for his culinary creations. But in these enlightened times, it's easy to forget that for much of human history, gases were mysterious and intangible. Even the etymology is enigmatic, the neologism “gas” being said to derive either from the German “geist” (ghost or spirit) or the Greek “chaos” (roughly translating as “ultra-rarefied water”).

During the eighteenth century, natural philosophers such as Priestley, Lavoisier and Scheele sought to understand and separate gases, eventually establishing the basis for modern chemistry. Each has a different claim to the discovery of oxygen, or “dephlogisticated air”, as Priestley erroneously called it. Priestley also discovered several other gases, often involving the use of animal experiments, which stimulated a discourse on the topic with his literary friend, Anna Laetitia Barbauld, who presented Priestley with “The Mouse's Petition”¹, a mock-serious poem in which the murine subject makes an eloquent case to be spared from experimentation. Writing in her obituary, William Turner elaborated on the story²:

‘The Mouse's Petition’ had its origin from the following circumstance: Dr Priestley, from the vicinity of his residence to a large brewery had been led to notice the suffocating vapor which is extricated in the process of fermentation (now so well known as the carbonic-acid-gas...). In the course of these investigations, the suffocating nature of various gases required to be determined, and no more easy or unexceptionable way of making such experiments could be devised, than the reserving of these little victims of domestic economy, which were thus at least as easily and as speedily put out of existence, as by any of the more usual modes. It happened that a captive was brought in after supper, too late for any experiment to be made with it that night, and the servant was desired to set it by till the next morning. Next morning it was brought in after breakfast, with its petition twisted among the wires of its cage. It scarcely need be added, that the petition was successful.”

Not all of Priestley's experimental animals enjoyed the support of a poetic advocate but the discovery of oxygen is a happier tale in which the mice in question were sustained by plant-derived oxygen, setting the scene for the later understanding of photosynthesis. In honour of Priestley - chemist, theologian, educator, and inventor of soda water (an achievement of which he was most proud), this month's issue is devoted to gas sensing and signalling, with several examples of biologically important “airs” and their roles in bacteria, plants, humans and yes, even the odd mouse. ■

1. Anna Laetitia Barbauld. Poems, 1773
2. William Turner. “Mrs Barbauld” The Newcastle Magazine, April 1825