Peter Woulfe (

Some people are messy. As those who know me will tell you, my office looks like it's been ransacked by a burglar. We messies cannot grasp how anyone can work in an office as tidy as a showroom. And does it even matter?

One of the messiest chemists, possibly of all time, was Peter Woulfe who is sometimes remembered for a piece of glassware that made gas handling safer and more effective. He was born in Ireland around 1727, most likely in Teermaclane (often written as Tircullan) in county Clare, not far from Limerick. As a young man he moved to Spain to join a brother Esteban (Stephen) in Cadiz, part of the Jacobite diaspora (opposite to that of the Huguenots) that had scattered wealthy Irish Catholics across Europe after their defeat at the hands of the English at Limerick. He later moved to Paris where a relation, the banker George Woulfe, was the agent for Charles Edward Stuart, the Young Pretender also known as Bonnie Prince Charlie. Another relation, Laurent (Laurence) Woulfe, was a banker, maritime insurance broker and venture capitalist who invested in the resurgent French mining industry.

Woulfe who had shown a strong interest in science since childhood began attending chemistry courses by the leading chemistry lecturer of the day, Guillaume-Francois Rouelle, who had a private lab and pharmacy in the Rue Jacob on the South Bank. Largely self-taught, Rouelle had secured a position of "demonstrator" at the Jardin des Plantes, the science and natural history institute in Paris. His lecture demonstrations were infamous, regularly upstaging and contradiction lecturers, much to the amusement of the audience who included the young Lavoisier and the encyclopaedist Diderot. Rouelle believed firmly in the four elements earth, water, air and Stahl's concept of phlogiston as fire; he did not exclude a possible fifth Paracelsian element, mercury. He delivered his lectures with unbridled enthusiasm, often tearing off his coat, his waistcoat, and his wig as he warmed to the subject.

From Rouelle, Woulfe got a superb grounding in practical chemistry and came into contact with many of the leading young scientists of the time. With his relations' contacts in the mining world he seems also to have developed a real love of mineralogy, travelling to Germany, Hungary and Bohemia starting to amass a collection of remarkable specimens.

Woulfe moved to London around 1750 but his Parisian contacts may have helped introduce him to the royalist John Stuart, 3rd Earl of Bute (no relation to Bonnie Prince Charlie) a Scottish aristocrat with a strong interest in the sciences, especially botany and mineralogy. Stuart, who had met the Prince of Wales around the time of the Jacobite uprising of 1745, became the future George III's tutor and would play an important role in building the King's collection of scientific instruments today housed at the Science Museum in London.

Peter Woulfe began working in Bute's home laboratory. In 1767, the same year he was elected to the Royal Society, he submitted a letter in which he described a new way of handling noxious gases like ammonia, hydrogen chloride and chloroethane by bubbling them through a flask or bottle containing water before collecting the gas in another container. Although the early chemist Glauber had previously described passing gases through an intervening vessel to cool them, Woolf's method had key advantages. On the one hand it hugely improved conditions in the laboratory. As he noted, when making "nitrous air" (nitric oxide) bubbling the gas through water serve to "prevent those noxious fumes, which have such an effect on the lungs of the operator, as frequently make him spit blood". But on the other he could also make exceptionally strong acids and alkalis. Woulfe later prepared the bright yellow dye picric acid (trinitrophenol) by nitration of indigo but missed its potential as an explosive.

Woulfe's skills and connections made him a key supplier of minerals for the great English collectors like William Hunter and his friend the Earl of Bute, although few individual minerals can be ascribed to him with certainty. He spent his winters and his summers in Paris, trips that probably included mineral prospecting trips. He supplied chemical reagents to Joseph Banks on his voyage to the South Seas with Captain Cook. Woulfe also worked closely with Priestley, providing him with glassware and advising on gas handling technique. Priestley's

But Woulfe's approach was old-fashioned and distinctly odd. Aside from attaching scribbled prayers to his apparatus, he seems to have been unaffected by Lavoisier's "new system of chemistry". Defending Stahl's phlogiston theory, Priestley would remember "Peter Woulfe, whose knowledge of chemistry will not questioned, saying that there has been hardly anything deserving to be called a discovery subsequent to it." Woulfe probably believed in transmutation and his work on mosaic gold (tin chloride) may have been driven by alchemical ideas.

When he as proposed for Fellowship of the Royal Society, his address, Old Bath Place in Clerkenwell, was where the Swedish mystical philosopher/prophet Emanuel Swedenborg stayed when visiting London and Woulfe was a member of a Masonic lodge devoted to Swedenborgian occult/mystical rites. Founded by a French surgeon Benedict Chastanier, the "London Universal Society for the Promotion of the New Jerusalem Church" was an offshoot of the "Illuminés d'Avignon"; both attracted a mix of radical preachers, artisans and scientists and operated on the edge of legality.

Later Woulfe would move into chambers in Barnard's Inn where he became ever more eccentric. The rooms were "so filled with furnaces that it was difficult to reach his fireside". He would entertain friends to breakfast at 4 am, but only if they used a secret knock to gain admittance. One of them commented that he once "put down his hat, and never could find it again such was the confusion of boxes, packages and parcels that lay about the chamber." He died after catching a cold, confident that he could cure it by taking a coach to Edinburgh and back.

It was an odd end to a strange and messy life. Although Woulfe used a flask with a side-arm in his original work, it would develop into a two or three-necked square shouldered vessel, sometimes called "Wolff" and thought to be German. It has been replaced today by Drechsel's wash bottle (CK10 June 2008). And our labs are tidier today, ironically driven by the same thing that worried Woulfe: laboratory safety.

I am grateful to Dr Peter Morris for his observations and corrections.

Reference: Peter Woulfe, Experiments on the Distillation of Acids, Volatile Alkalies, &c. Shewing How They May be Condensed without Loss, and How Thereby We May Avoid Disagreeable and Noxious Fumes:, *Phil. Trans.* **1767**, *57*, 517-536.