

The magic of chemistry



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Brian Iddon has been associated with the production of this Journal and is a lifetime member of the Parliamentary & Scientific Committee. He is one of the few chemists (or even scientists) who has managed to combine a political career with a scientific one. Here he highlights his experience as a science communicator and wonders why live demonstration lectures are rarely presented today?

When I was appointed as the first Senior Demonstrator in Organic Chemistry at the University of Durham in 1964, I was one of several members of staff who organised open days for which I acquired a collection of chemical demonstrations. I also used these when I was appointed as a Lecturer in the emerging University of Salford in 1966.

From such beginnings I developed a demonstration lecture, which was first presented as the Christmas Lecture, *Organic Chemistry at Work*, at the University of Manchester Institute of Science and Technology (UMIST) in 1968. After changing the title of my 'show' to *The Magic of Chemistry* I ended up presenting it for 29 years, a total of 360 shows, travelling an estimated 3,000 miles each year in my car loaded with all my equipment. I spent several hours at Salford preparing for the next show, about two hours setting up the demonstrations and projectors at each venue, and a similar amount of time packing up the apparatus and chemicals to transport them back to Salford.

I have travelled all over Britain, from Thurso in Scotland to Redruth in Cornwall, and taken the lecture to Denmark, Sweden, Dublin, Belfast and Naples (seven lectures altogether at one of the biggest science fairs then held anywhere in the world in Na-Po-Li, the symbols for the elements of sodium, polonium, and lithium). Imagine the logistics involved in my tours abroad.

Whereas demonstration lectures were often given in the past, they are seldom presented live today – some can be found on YouTube. Academics today are under more pressure to prove that their research is of international importance

than they were when I began my academic career.

I was inspired initially by Professor Lt Colonel BD Shaw of Nottingham University who gave a demonstration lecture entitled *Explosives*. BD would load one of his antique muskets (he had a collection of antique guns) with some home-made gunpowder and use it to fire a candle through a 'barn door' (actually five-ply plywood). When I first saw his lecture at the University of Hull as an undergraduate student he brought down part of the physics lecture theatre ceiling. BD carried on presenting his famous demonstrations long after he officially retired, in fact into his 90s.

Even before Michael Faraday began his Friday Evening Discourses and Christmas Lectures at the Royal Institution (RI) in London's Albermarle Street there was strong public interest in watching scientists conduct experiments. Humphrey Davy was Faraday's predecessor at the RI and his 'shows' in the now famous Faraday Lecture Theatre attracted so many people arriving by horse and carriage that Albermarle Street was made the first one-way street in the world. Today the RI Christmas Lectures are broadcast on TV. I was thrilled when I was invited by the RSC to present *The Magic of Chemistry* at that venue! The picture on the next page shows me in action using the same demonstration bench that Davy and Faraday (and many other prominent scientists) used.

At the time I was touring with *The Magic of Chemistry*, a number of other scientists were also delivering their lectures live and there were a number of science festivals in this country. I delivered my presentation at the

Edinburgh International Science Festival in 1993 and at SciTech95 in Derby, where I 'headlined' on the programme of events with David Bellamy and Johnny Ball, who started his career as a stand-up comedian in Bolton's clubland.

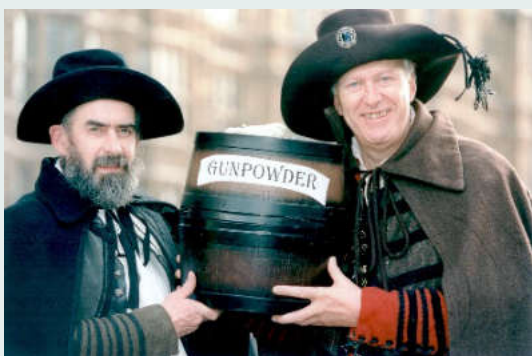
I guess that one reason why scientists stopped presenting such live 'shows' was the impact of health and safety legislation.

Other notable presenters of such lectures in Britain were the Rev Ronald Lancaster, with his lecture entitled *Fireworks*, and John Salthouse with his lecture *Son-et-Luminaire*. Ron Lancaster taught chemistry for 25 years at Kimbolton School where he manufactured fireworks under licence to entertain its staff and pupils. Later, he founded Kimbolton Fireworks, a company which has given many impressive public firework displays in Britain.

I guess that one reason why scientists stopped presenting such live 'shows' was the impact of health and safety legislation. John Salthouse's demonstration lecture was essentially the result of 'look what happens when I mix this chemical with that one'. The result was 'flashes and lots of bangs (some quite loud)'. At one of his presentations a very elderly gentleman arrived early and proceeded to engage John in conversation while he was setting up his demonstrations (fatal!). John thought this was a well-meaning and friendly member of the audience until a summons arrived several weeks later. The elderly gentleman claimed that John's demonstrations had made him deaf.



Presenting The Magic of Chemistry at the Royal Institution



The first people to legally explode gunpowder in the Houses of Parliament



I had one or two 'near misses', most notably in the lecture theatre in Oxford where Thomas Huxley famously defended Darwin's theory of evolution in 1860 against the Bishop of Oxford, Samuel Wilberforce. After some inspiring music one of my 'helpers' would switch off all the lights in the room as I raised a lit taper on the end of a stick to set off the first of a line of hydrogen/oxygen-filled balloons, suspended by cotton thread from a 'washing line', which would cannon off each other as they exploded with loud bangs.

However, on that occasion, my 'helper' was so enthusiastic that he turned off the lights too soon. I couldn't see the first balloon as my eyes tried to adjust to the darkness. The result was that, as it exploded into flame it was also let loose and flew off down this narrow lecture theatre over the heads of the audience, getting lower and lower as it lost propulsion. It reached the back row and was snuffed out when it landed on the floor behind the back row of people. There were shouts of 'encore' as my panic began to fade!

When I first did the daunting South West Tour in 1974, the M5 ended at Bristol, so the journey out to the Mining College at Redruth was torturous. That 'show' was followed by another one in Plymouth, and two more shows at Exeter University. I repeated this tour in 1982, 1986, and 1990. Another arduous tour in 1993 involved presentations in Aberdeen, Thurso, and Inverness followed by a journey home over the Cairngorms in a blizzard, a round trip of 1,075 miles.

I was 'featured' in Encyclopaedia Britannica's 1995 *Yearbook of Science and the Future* in a chapter entitled Lecture Demonstrations: Science's Live Theatre, written by George B Kauffman, who described me as one of 'Today's masters of the scientific demonstration'.

One of my regrets is that, in 29 years, I never visually recorded any of the 'shows' which I presented, although I once appeared with Alan Titchmarsh in one of his Pebble Mill (Birmingham) lunchtime productions. It celebrated an Anniversary of Tomorrow's World, with Raymond Baxter, who first presented the show in 1965, Kate Bellingham (the then presenter of that show), the ever-monocled President of the Inventor's Club Bob Syme, also a TV personality, and Professor Steve Jones, a well-known academic geneticist who was also interviewed.

My friend Dr Tom Paterson, a Senior Technician at the University of Salford, prepared gunpowder for my fireworks which I could use to wake up the audience throughout my performance. Together, we were the first to give excerpts of *The Magic of Chemistry* in shopping malls (at Telford and Perry Bar, Birmingham) – we were the first 'chemical buskers'. On 5 November 1997, we presented excerpts of my 'show' in the Jubilee Room (off Westminster Hall) at the Houses of Parliament and became the first people to legally explode gunpowder in the Houses of Parliament, at a time when the IRA were still active in London. The logistics involved in putting that 'show' on were complicated. It generated a lot of interest though from Members of Parliament and the press. My final performance, again assisted by Tom, was at the Science Museum in Kensington during Chemistry Week on 19 November 1997.

It was Dr Stephen Benn, then Parliamentary Liaison Officer at the Royal Society of Chemistry, today a Deputy Speaker in the House of Lords, who pointed out to me that Guido Fawkes and some of his co-conspirators visited Ordsall Hall (today situated in Guy Fawkes Street) in Salford in an attempt to engage leading Lancashire Catholics in the Gunpowder Plot.