

## The Scientific Achievements of Prof. Michael Cooke



Figure 1. Prof. Michael Cooke chairing a ChromSoc session in London [March 2016]

His wife, Christine, remembers that he came back from that meeting in March re-inspired by chemistry and so pleased that the Chromatographic Society was able to move forward again."

Michael Cooke has made a very significant contribution to the scientific literature and to the applications of analytical chemistry to problems of environmental pollution, structural elucidation of metal complexes and determination of various pharmaceutical compounds in biological fluids. Prof Cooke has been a pioneering innovator in gas and liquid chromatography using these techniques coupled with mass spectrometry and other sensitive specific detectors to address environmental analytical problems.

A literature search revealed that Mike has published over 70 papers in the 35 years from 1967 to 2002 and co-authored an Encyclopaedia of Separation Science.

Mike started his research career at University of Bristol where he focussed on structural determinations of iron carbonyls and the rather more exotic metals, ruthenium, osmium and molybdenum as organometallic complexes.

His interest in the measurement of gases and noxious substances led him to adopt and develop capillary gas chromatography and couple it with mass spectrometry and atomic fluorescence detectors. He used these coupled techniques to measure these compounds in the environment.

His first publication using chromatography was in 1977 on the determination of cabamazepine in plasma using gas liquid chromatography (glc). He published with Graham Nickless et al at Bristol on analysis of polychlorinated naphthalenes, polychlorinated biphenyls and polychlorinated terphenyls and later on DDT in soils and birds of prey via carbon skeleton gas-liquid chromatography.

With David McCalley, they developed a simple gas chromatographic screening procedure for lactic and pyruvic acids in human plasma.

Mike's interest in the measurement of poisons in our environment continued with determination of cadmium in cockles and snails and polyaromatic hydrocarbons in the Severn estuarine sediments, again working with Graham Nickless.

The introduction of RP-HPLC in the late 1970s didn't go unnoticed by Mike and he published a rapid assay for theophylline in clinical samples by reversed-phase high-performance liquid chromatography. Later on, he published an HPLC method for the determination of chlorhexidine. He compared gas with liquid chromatography for the determination of theophylline in clinical samples.

His interest in environmental pollution gave rise to a paper measuring the effectiveness of sewage treatment on fecal sterols and trace determination of the fecal sterol coprostanol again researching with Nickless and McCalley.

One of the major problems in glc was the presence of active sites on columns so Mike spent some time investigating thermo stable deactivation reagents for capillary column preparation along with simple gas-loop injector systems. Preparation of thermally stable cyanosilicone capillary columns formed the basis of a later paper.

Mike returned to his interest in metals, tissues and the environment with trace element profiling of dental tissues using laser ablation-inductively coupled plasma-mass spectrometry.

He profiled environmental contamination from lead, copper and cadmium using the woodlouse as a bio accumulator and potentiometric stripping analysis for the metals' measurement.

He patented a sensor for volatile materials and gases with John Hinton in 1997.

With Christine Cooke he published a correlation of the antimony concentration in umbilical cord and in infant hair measured by hydride generation-atomic fluorescence spectrometry.

Around the millennium he worked with Prof. Keith Bartle of Leeds University publishing on programmed temperature vaporization injection (PTV) for the analysis of the constituents of landfill gases by gc-ms. They analysed malodorous sulphur gases and volatile organo-metalloid compounds in landfill gas emissions using capillary gc with programmed temperature vaporization injection and atomic emission detection.

Professor Michael Cooke has contributed significantly to the development and application of chromatography and sensitive detectors in their many and various forms.

His work has enriched our knowledge of the environmental effects of pollution in the last three decades of the 20<sup>th</sup> Century, which history will record as an awakening period of man's growing concerns of the impact and damage that we are doing to our planet.

**Dr. Chris Bevan:**

Former President of The Chromatographic Society and currently its Events Coordinator.

## Personal Tributes to Prof. Michael Cooke [1946 to 2016]

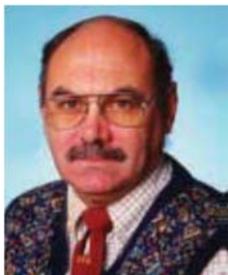


Figure 2: Prof. Michael Cooke, President of The Chromatographic Society (1994-1996)

In many ways writing a personal obituary on a good friend and former team mate could be a daunting task but writing one on Mike Cooke has been a pleasure for me. Everyone I contacted to say a few words about him had a consensus of opinion.

*A man full of good humour, good practical science and a penchant for having a good time.*

Be it downing a pint or two or sampling a tasty Indian curry, the evenings after a symposium were time well spent in Mike's convivial company.

I discovered and shared his taste for a good curry and Scotch malt whiskey in the evenings after the ISC at Bournemouth back in 1994 when we discovered the delights of an Anglo-Indian restaurant in Bournemouth together with other Chromsoc delegates after one of our finest international symposia.

Mike was a generator of good ideas on promoting and widening the scope of The Chromatographic Society. With Ian Wilson, they formed the PYE104 club, a nostalgic somewhat nerdy scientists' celebration of the old well loved instruments we used back in the 1960s and 70 s when glc was in its youth. Good old English instrumentation born out of Cambridge, England, rather than the many US variants. Most laymen will remember PYE as a radio manufacturer but they also made good GCs and lots of spectroscopic instruments too as PYE UNICAM .

Mike was a generous man both with his knowledge and his connections. When I needed a compressor for powering my recently won ABI 270A CZE instrument, Mike found one and donated it to me. My daughter's A level GCE chemistry practical project proved a success for her by her developing a method for determining caffeine in soft drinks by CE with the aid of Mike's Jun-Air pump and my ABI 270A.

Mike's invitation to my wife and I to join him at a formal dinner at the auspicious building that is The Royal Holloway College was a night to remember. I represented ChromSoc and enjoyed a lovely meal in good company and looked around their enviable collection of art work after the formal dinner.

Mike continued to support The Chromatographic Society after leaving its committee as its Honorary Treasurer by independently auditing our accounts to the high standards demanded by the Charities Commission. The Honorary Treasurer position of the society's committee had always proved difficult to attract volunteer office bearers and Mike was one of our most able treasurers.

**Mike had many colleagues, who like me, regarded him as a personal friend and I include here some tributes and memories from some of them.**

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**Prof. Colin Poole** said of Mike Cooke:

Sad news about Mike. I got to know him well during my stay in the UK (1995-96) when we worked on ChromSoc business and the Encyclopaedia of Separation Science together with Ian Wilson and Ted Adlard. The group was perhaps UK-centric but that allowed for easy meetings in various pubs and bars around the country and the production of a product I am proud to have been associated with. Mike was an erudite and humorous co-conspirator since neither of us would really have qualified as part of the status quo. He was a surprisingly good politician who read the academic landscape well and prospered from this knowledge. His survival instincts were good and he made useful contributions to the fashionable areas of separations and spectroscopy. Even in 1996 he was planning early retirement and looking for a way out of the general grind that academia had become. I hope he succeeded in that regard. I will remember most his bonhomie and the laughs we had. Serious business with a grin and a beer.

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**Professor Mike Cooke**

Two words sum up Mike – he was above all else good natured. Whether in the professional or private sphere his genial and co-operative personality shone through; this ability allowed him to get the best out of others.

Mike began his career at the University of Bristol where he was strongly influenced by the doyen of UK analytical organic geochemistry, Prof Geoff Eglinton. This early training in GC fundamentals ensured that whatever Mike did was based on sound scientific principles. He established, at Royal Holloway and on his appointment as Head of Chemistry at Sheffield Hallam, two noted centres for environmental analytical chemistry where he pioneered new chromatographic detection methods. Prominent among these was the first intensive use in UK of the Atomic Emission Detector which Mike used to help analyse environmental samples for compounds containing less frequently met elements

Hearing that at Leeds we were interested in applying similar approaches in atmospheric analysis, Mike initiated a fruitful collaboration; it was a matter of considerable pride to both of us that the two students involved have gone on to senior positions, one in UK industry and the other in a leading Thai University.

On retiring, Mike returned to his roots in rural Somerset where he indulged, all too briefly, his twin passions for country life and for Somerset cricket. Summer days at the Taunton County Ground found him hosting convivial and immensely enjoyable gatherings of friends.

We shall miss him:

**Keith and Christine Bartle**

Mike originally researched in organometallic chemistry, obtaining his PhD under the direction of Dr Michael Green at Bristol, and later publishing several papers as co-author with the redoubtable Professor of Inorganic Chemistry F.G. A. Stone. In the mid-1970s, after returning to Bristol from Postdoctoral work in Tucson, Arizona, he was moved (initially against his will) to a permanent position assisting Dr Graham Nickless and Dr David Roberts with running the highly regarded Bristol MSc course in analytical chemistry, which received a significant number of research council studentships. Mike soon developed new research interests, especially with separation science and capillary gas chromatography, which at the time was very much a technique for the specialist only. Mike was instrumental in attracting experts such as Konrad Grob from Zurich, to give lectures and courses at Bristol. While capillary GC was already established in the University in the Organic Chemistry Unit under the direction of Professors Geoffrey Eglinton and James Maxwell, the courses given by Grob helped to disseminate the fundamentals of the technique and the skills of column preparation to a wider audience of academics and industrialists. At the time, ready-prepared glass columns of good quality were only available from a few outlets, at very high prices. While commercially prepared fused silica columns were soon set to revolutionise the market, Mike's students investigated new areas, such as preparation and use of thick stationary phase film columns to enable separation of very volatile compounds. Mike's considerable energy was applied not only to the MSc course, but also to the supervision and co-supervision of PhD students with Graham Nickless and David Roberts. He also shared Graham's interests in environmental analytical work, including research on sterols as pollution indicators (with David McCalley, now Professor of Bioanalytical Science at the University of the West of England). Another of his past students, Dr Carolyn Morton (now Senior Lecturer in Forensic Science at UWE) recalls lighter moments during her PhD "I remember him being amused at a package arriving addressed to Dr Mike Cookewithanee! (He always said that his name was "Cooke with an e"! He told me he had a cat called "Ceremony" so that he could say to visitors that they were "not to stand on Ceremony". Mike had a passion for cricket. He would follow test matches in his office in Bristol on a portable TV (which were rare at the time!). Professor Selby Knox remembers Mike as "a solid, dour opening bat, occasional leg spin bowler and superb slip fielder for the Bristol Staff team. The highlight for me was - after a lifetime of blocking - when he went absolutely loco at Frampton Cotterell one day and hit something like 135 not out, smashing them out of the park all afternoon, after which he transformed himself into an attacking batsman. Extraordinary."

**Professor David McCalley**

Professor in Bioanalytical Science  
University of the West of England,

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## **Prof. MICHAEL COOKE**

**President of The Chromatographic Society (1994-1996).**

### **Mike's Life after Science, in his retirement:**

After some time working with industry and the University of Bristol, Mike Cooke became a Professor at Sheffield Hallam University and then at the Royal Holloway College, University of London

Mike retired in 2001 to a beautiful 2.5 acre estate in Bampton, Devon after holding two Professorial appointments at Sheffield Hallam and Royal Holloway Universities.

Due to chronic ill health he moved from this idealistic valley to a more manageable house in Bampton in July 2006.

He told me that the only thing he really missed was the fishing, since he had owned about 150 yards of single bank fishing in the River Bathern – packed with wild brown trout, and all his!

Figure 3: The picture below shows what he got up to in his spare time. (Successfully landing a 9 1/4 lbs trout from his beloved River Bathern and a huge Sea Bass off the Devonian coast).



**Mike passed peacefully away on 6<sup>th</sup> November 2016 .**

**We shall all miss you Mike, you enriched all our lives.**

**Dr. Chris Bevan:**

**Former President of The Chromatographic Society and proud to have known Mike.**