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From the Editor

This is the first of our new-look Historical Group newsletters and I hope overall it meets the needs of our group members and anyone else with an interest in historical aspects of chemistry. Changes are forced upon our format by costs and practical constraints as well as the need to move forward. The new format should allow us to make the newsletter more accessible to different types of content, with live online links to the RSC website and other places of interest to our community.

As the new editor, my first task is to thank Anna Simmons, for her hard work and dedication over the past 15 years in editing and producing our newsletter twice a year. As I take over I am conscious of the excellent quality of contributions she has commissioned over the years and of the effort needed to make sure we are all kept informed of the happenings in our group.

Thanks must also go to Gerry Moss who has contributed greatly on the production side both for the print copy and the upkeep of the Queen Mary College version of the website, which can be found here.

I hope you find our new look interesting and informative. I welcome any feedback from readers; please do email me with your thoughts. Also if you would like to contribute to any of the sections or have a proposal for something of historical interest that you would like to share via the newsletter, please do contact me, putting RSC HG in the title line (to stop it going to junk!).

Anna Coyle

RSC HISTORICAL GROUP NEWS

From the Chair

In the last edition of the Newsletter, we announced that Anna Simmons would be standing down as editor after many years of service. We also said that various other changes were under way to the way the Newsletter is planned and prepared. Now, here is the result of those changes.

First, I am glad to be able to report that Anna Coyle has agreed to take over as Newsletter editor on an interim basis. Anna has wide experience in editorial work, having been employed by the RSC for several years as part of their editorial staff. We are delighted that she feels able to take up the role of Newsletter editor on behalf of the Group.

Second, there has been a change of format, and this is the first issue to appear in A4 page size. For a variety of reasons, this is easier to prepare than our previous A5 size and so, from now on, this will be the format of the Newsletter. We have also formed a small editorial committee to support Anna Coyle in her work as editor. Of particular importance for this committee will be ensuring that there continues to be a wide variety of articles of interest to members of the Historical Group. New issues will continue to be announced when they are published, using the RSC e-alerts. As you know, these are sent regularly to all members via e-mail.

Finally, we have also formed a small committee to oversee the monthly webinar series, now that Peter Morris is standing down from organising them. After some discussion, the webinar committee decided to keep the frequency of webinars as monthly and put together an initial programme of talks up to November. Peter Morris has given his continued support to this committee, and the new programme is attractive and covers a wide range of historical topics. We have every intention that this will be the pattern in the months to come, and I hope you will find the presentations on offer to be of interest.

John Nicholson

LinkedIn

The RSC Historical Group has an active LinkedIn page, managed by Andrea Gallio, a member of the RSC HG Committee. Subscribers to the newsletter with a LinkedIn profile are encouraged to follow the page, engage with it, and circulate to their own network. The page can be found here.

RSC YouTube Channel

A reminder that all the past online talks can be viewed on the RSC's Historical Group's YouTube channel. They can be viewed here.

RSC Historical Group Newsletter Digital Archive

More of the Historical Group's series of Occasional Papers have been added to the digital archive including Frankland — the First Organometallic Chemist, A paper by Colin A. Russell based on the Fourth Wheeler Lecture, given at Burlington House in March 2009.

All issues of the newsletter since 2010 are now available on the Historical Group Archive page of the RSC website. Uploading the remainder of the past newsletters since its first edition in June 1981 is an ongoing project.

The Historical Group's home page can be found at

https://members.rsc.org/site/content/Community/InterestGroups/HistoricalGroup.aspx

RSC Historical Group History Published

To mark its 50th anniversary, The Historical Group has now published *The Historical Group of the Royal Society of Chemistry: A History from 1975 to 2024*. Written by long standing member Dr Peter Morris, the publication traces the work of the group from its first meeting of the group at King's College London (KCL) in March 1975 to the ongoing, highly successful on line talks that were instigated because of the Covid pandemic.

In the foreword RSC Chief Executive Helen Pain she says: “Over the last 50 years, it’s grown from a small group of around 150 members to now nearly 1000. Volunteers work with over 70 interest groups and collaborate with global organisations such as the European Chemical Society and the American Chemical Society, promoting public understanding of chemistry and providing a forum for discussion”.

All members should have received information about its publication; alternatively it is available on the RSC Historical Group pages of the RSC website here. Any member who would like a paper copy can obtain one by contacting Peter Morris by email at doctor@peterjtmorris.plus.com.

INTERNATIONAL CONFERENCE ON THE HISTORY OF CHEMISTRY 2029

We are delighted to announce that the International Conference on the History of Chemistry (ICHC) will take place in London in summer 2029. Every two years the History of Chemistry Division of the European Chemical Society (EuChemS) organises a conference to facilitate communication between historically interested chemists, museum curators, science educators and historians of chemistry and to gather the community together on a regular basis.

Despite ICHC having met for nearly thirty years, the conference has never been held in Britain. Currently we are planning for a split site meeting between the Royal Society of Chemistry in Burlington House, Piccadilly, and University College London (UCL) in Bloomsbury. The meeting will take place in summer 2029 between late-June and the end of July, with dates to be announced nearer the time.

Top: The courtyard of Burlington House
Mid: the entrance to the RSC
Bottom: The Christopher Ingold Building housing UCL's Chemistry Department

The planning for the meeting will be led by Frank James (Chair of the Society for the History of Alchemy and Chemistry (SHAC)), Anna Simmons (SHAC Deputy Chair) and John Nicholson (RSC HG chair). The proposed theme for the conference is "Chemistry and Culture" and the conference will include visits to London scientific sites and an excursion to Cambridge.

2029 marks the bicentenary of the death of the chemist Humphry Davy (1778-1829) and the conference will link into commemorations currently being planned. We hope that RSC Historical Group members will participate in the conference or volunteer their time; it will be possible to attend single days, combinations of days or the whole conference. Updates to follow in future newsletters!

MEMBERS' NEWS

Annette Lykknes wins Award for Outstanding Achievement in the History of Chemistry

The winner of the Joseph B. Lambert HIST Award for Outstanding Achievement in the History of Chemistry for 2026 is Annette Lykknes. Awarded by the American Chemical Society, the award recognizes her outstanding contributions to the advancement of the study and communication of the history of chemistry.

The award committee noted "Professor Lykknes has contributed to an amazing array of research topical areas including: history of women scientists, studies of the collaborations of couples in science, history of the periodic table, discovery of the chemical elements, history of chemical education, how twentieth-century chemical engineers shaped the relationships between the academy and industries, and the application of the history of science to teach science."

Norwegian-born Lykknes is Chair of the Division of History of Chemistry of the European Chemical Society, a position she has held since 2021, and was vice-chair from 2011. She is now the Editor-in-Chief of the flagship journal *Ambix*. She worked as a school teacher before completing an MSc in chemistry and chemistry education in 1998, followed by a Ph.D. at the Norwegian University of Science and Technology. She is currently a professor of chemical education there.

On receiving the honour Professor Lykknes said: "Over the course of my academic career, I have collaborated extensively with chemists and other natural scientists as well as with educators within these fields, with historians, philosophers and sociologists of science, with pedagogy scholars and with language experts and researchers of the Norwegian language, and even with a political scientist.

The Partington Prize 2026

The Society for the History of Alchemy and Chemistry is delighted to announce that the winner of the 2026 Partington Prize is Dr Flavio Bevacqua of University of Padua for the entry *Alchemy in 15th-Century Byzantium: The Case for the Role of Georgios-Gennadios Scholarios' Circle*.

Flavio's entry brings together for the first time two medieval texts in the history of alchemy, reconstructing the intellectual milieu surrounding the Byzantine scholar Georgios-Gennadios Scholarios. The author diligently and judiciously integrates manuscript evidence with philological analysis and cultural contextualization, illuminating a previously underexamined dimension of alchemical history in Byzantium.

Flavio Bevacqua is a postdoctoral researcher at the University of Padua. He graduated from the same university with a bachelor's degree in Classics and a master's degree in Classics and Ancient History. He obtained his doctorate in Classical Philology and Ancient Philosophy in 2025 in a joint agreement (cotutelle) between the University of Padua and the Sorbonne Université in Paris, with a dissertation focused on the works of the so-called Anepigraphos Philosopher, a seventh- or eighth-century author transmitted within the Greek alchemical corpus.

His research interests include the transmission of scientific and philosophical knowledge from Antiquity to Byzantium and the Islamicate world, on to early modern Europe; and Greek manuscripts, palaeography, and codicology, with a focus on the history of texts and philology
The Society for the History of Alchemy and Chemistry established the Partington Prize in memory of Professor James Riddick Partington, the Society's first Chairman. It is awarded every three years for an original and unpublished essay on any aspect of the history of alchemy or chemistry. The prize-winning article will be published in the Society's journal, *Ambix,* in 2026.

2026 Priestley Lecture

Priestley Statue in Burlington House

Helen Cooke, committee member of the Historical Group, will be giving this year's Priestley Lecture for the Leeds Philosophical and Literary Society at Mill Hill Chapel, Leeds, on 22 September. Details of the venue can be found here.

Joseph Priestley (1733-1804) is best known for his discovery of oxygen in 1774. He lived in Nantwich, Cheshire, from 1758 until 1761, while still a young man. Helen's talk explores Priestley's life and time in Nantwich, where he was a non-conformist minister and school teacher. In her talk Helen will look at how his time in Nantwich contributed to his later scientific, religious and pedagogic development.

Helen Cooke

Priestley's memoirs contradict some local stories and Helen will draw on new research to correct some misleading elements of the tales about this endlessly fascinating Enlightenment figure.

Helen now lives in Nantwich where she volunteers at the Museum. She has previously been the Chemistry Librarian at the University of Manchester Institute of Science and Technology and worked for the pharmaceutical company GlaxoSmithKline in the USA and UK.

SHORT NOTICES

2027 Morris Award: Call for Nominations

The Society for the History of Alchemy and Chemistry solicits nominations for the 2027 John and Martha Morris Award for achievement in the History of Modern Chemistry. This award honours the memory of John and Martha Morris, the late parents of Peter Morris, the former editor of *Ambix*, who has contributed the endowment for this award.

The recipient chosen to receive the Morris Award will be expected to deliver a lecture at a meeting of SHAC, where the awardee will be presented with an appropriate framed photograph, picture or document and the sum of £300. Nominations are invited from anywhere in the world.

A complete nomination consists of

- a complete curriculum vitae for the nominee
- a letter of nomination summarising the nominee's scholarly achievement in the history of recent chemistry (post-c. 1960) and the unique contributions that merit this award
- names of two or three individuals for the panel to contact for further information if needed.

Only complete nominations will be considered and the documents must be submitted in electronic form. The Award will be judged by the selection panel on the basis of excellence in scholarly publication (papers and/or books), with nominations encouraged of scholars at all career stages and from chemist-historians and historians of chemistry.

All nomination materials should be submitted by e-mail to Peter Morris at doctor@peterjtmorris.plus.com and a separate email confirming the material has been sent to the same address (a precaution in case of incomplete transmission of documents) to arrive no later than 1 May 2027.

RSC HISTORICAL GROUP MEETINGS

Chemists as Politicians

The next Historical Group meeting at Burlington House will take place on Friday 16 October 2026, at Burlington House, Piccadilly, London W1J 0BA. The meeting is open to all and registration is free. The theme is Chemists as Politicians. The first half of the meeting will include talks given by historians on Lyon Playfair, Henry Roscoe, Stafford Cripps and Margaret Thatcher. The second half will be talks given by living chemists who became MPs. Details of all the speakers are here.

Note that tea and coffee will be available, but lunch is not. There are however many inexpensive lunch options in and around Piccadilly.

If you would like to attend please contact Mike Leggett, Historical Group Secretary, to secure your place.

Boyle @ 400

Robert Boyle was born at Lismore Castle on 25 January 1627. To mark the 400th anniversary of this event, a one-day conference celebrating Boyle and his achievements will be held at the Royal Society of Chemistry, Burlington House, London, on Monday, 25 January 2027.

A bust of Robert Boyle is displayed in the entrance hall of the RSC at Burlington House

This event is organised by the Historical Group of the Royal Society of Chemistry and the Society for the History of Alchemy and Chemistry. Speakers will include Peter Anstey, Michael Bycroft, Michele DiMeo, Sachiko Kusukawa and Lawrence Principe. It

is hoped that there will also be a round-table discussion on the significance of Boyle for modern science.

There is no charge for registration, but those wishing to reserve a place should send an e-mail, with 'Boyle meeting' in the subject line to the SHAC administrative co-ordinator at meetings@ambix.org.

As usual, there will be no charge to attend. This meeting will replace the Historical Group's usual meeting in March 2027.

OTHER MEETINGS

SHAC Meeting at the Deutsches Museum, Munich, 5-6 November 2026

SHAC's autumn meeting, kindly hosted by the Deutsches Museum in Munich will take place on 5 and 6 November 2026. The provisional social programme will include an optional museum visit and conference dinner. Numbers are limited because of the capacity of the Museum's meeting room and participants are recommended to register early. For further information on the programme and a link to book tickets please contact the SHAC administrative co-ordinator at meetings@ambix.org.

Dyes in History and Archaeology conference

The 45th annual Dyes in History and Archaeology conference will take place at the University of Helsinki in Finland, on 28–30th October 2026. The conference will consist of a three-day programme of posters and presentations at the University of Helsinki, with an excursion for interested participants following the conference on Saturday 31st October. For more information please visit the conference website.

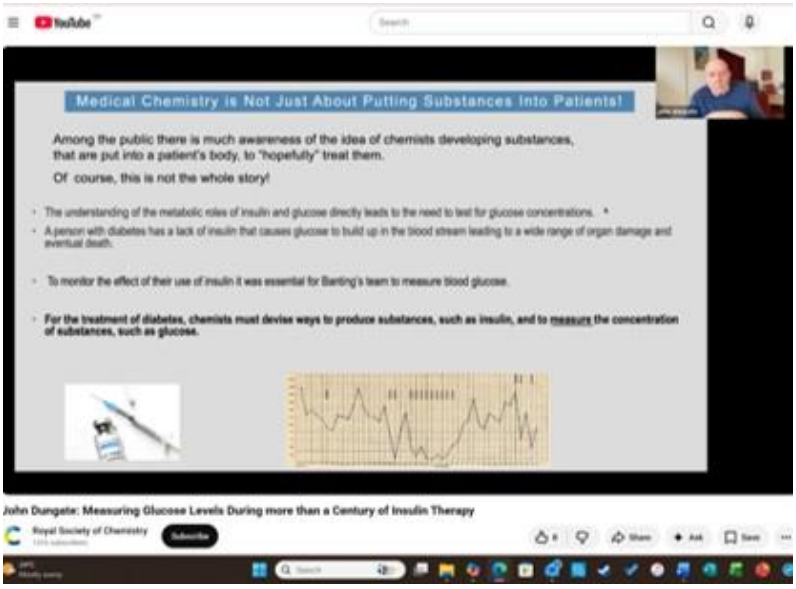
RSC HISTORICAL GROUP ONLINE LECTURES

Alice Harman has taken over as host of the online lectures presented monthly by the Historical Group. All the talks, including those mentioned below, are available on the RSC Historical Group's YouTube Channel here.

The talks are given live on the second or third Tuesday of the month. An email with the details of how to join is sent out a few days before the meeting.

Some recent talks include:

Measuring Glucose Levels During more than a Century of Insulin Therapy for Diabetic Patients by John Dungate



The first successful treatment of a diabetic patient with insulin was that of Leaonard Thomson on the 23rd of January 1922. He was only 14 but he was not expected to live much longer. However, following the commencement of insulin treatment, he lived for a further 13 years. Given how crude the methods of preparing the insulin were the additional life he gained was remarkable. The news of this success gave hope to millions of people around the world who had been given a diagnosis of diabetes. A diagnosis which had previously been an effective death sentence! The work of Banting, Best, McCleod and Collip in Toronto has been widely acknowledged. This was principally for the

extraction and purification of insulin and its first use on patients, to reduce the dangerously high blood glucose (BG) levels to normal levels.

John Dungate had a 30 year plus career in the West Midlands teaching Chemistry to A level and H.E students. By the time he retired he was Director of the Department of Science and Maths, in what had become the large Birmingham Metropolitan College. However, although he had become senior manager, he always insisted on teaching students.

Maria Y. Orosa: Filipina Pioneer Food Chemist by Geoff Rayner-Canham and Marelene Rayner-Canham

When women chemists do appear in historical accounts, with very few exceptions, they are European or North American. We have found others! Here, we describe the life and work of Maria Y. Orosa. Orosa, born in Manila, Philippines, in 1892. She loved chemistry in school. However, as a young woman, she could only obtain admission to the Pharmacy program at the University of the Philippines. On a scholarship, she travelled across the Pacific to the University of Washington, U.S., to continue her university education, taking a Pharmaceutical Chemistry program. Orosa persevered, despite community racial hostility towards Asians. She obtained a B.S.(Pharmaceutical Chemistry) then, with the encouragement of Charles Johnson, Dean of Pharmacy, an M.S.(Pharmacy) while undertaking work as a food chemist. She felt it was her patriotic duty to return to the Philippines and to improve

the nutritional basis of the diet. In the presentation, we describe her life and amazing career. Sadly, Captain Orosa was killed “in the Line of Duty” in 1945, during the second battle of Manila in WW2.

Geoff Rayner-Canham (Professor Emeritus) and Marelene Rayner-Canham (Retired, Staff) of the Grenfell Campus, Memorial University, Corner Brook, Newfoundland, Canada, continue their research into long-forgotten pioneering women in chemistry.

Mercury, arsenic and curing the Great Pox by Alan Dronsfield

It is thought that syphilis came to Europe in the 15th century, imported on ships returning from the New World. It is highly infectious and, in the absence of effective treatment, can prove fatal. Not all cases progress to this unhappy ending and most infections are accompanied by periods of remission. These were incorrectly attributed to the patients’ previous treatments which unjustly gained in reputation and popularity. Prominent was the use of mercury (either as the free element or in the form of compounds), often administered until signs of poisoning set in. These were mistakenly believed to be indicative of curative action.

The application of mercury continued as late as the 1920s, then being used as an adjunct to treatment with arsenic compounds. This element had earlier been found to be effective for ridding the blood of the parasites responsible for syphilis (and, also, sleeping sickness). However, its toxic nature and propensity to cause blindness mitigated its use. In 1909 Paul

Ehrlich synthesised Salvarsan, a preparation relatively free from side effects and effective against the disease. It was the main method of treating syphilis until the advent of penicillin (in the late 1940s). A single injection of this antibiotic could cure the disease. The picture today, though, is somewhat clouded as penicillin-resistant forms of the disease are starting to emerge.

Alan Dronsfield is an emeritus professor from the University of Derby and a former chair of Royal Society of Chemistry's Historical Group.

Cryolite by Helge Kragh

The mineral cryolite (Na_3AlF_6) found in southern Greenland is rare but has a most interesting chemical and industrial history. First identified in 1795, since the 1860s it was used in large-scale manufacture of soda and also in the production of aluminium. The cryolite mine in Ivittuut, Greenland, was closed in 1987. My online presentation will focus on the early history c. 1820-1900 and include well-known chemists such as J.J. Berzelius from Sweden and J. Thomsen from Denmark.

Helge Kragh is a Danish historian of science who focuses on the development of 19th century physics, chemistry, and astronomy. He is emeritus professor at the Niels Bohr Institute at the University of Copenhagen and at the Centre for Science Studies of Aarhus University.

MEETING REPORTS

Remembering Bill Brock (1936-2025): chemistry and culture

An event arranged by the Society for the History of Alchemy and Chemistry (SHAC) and at the Maison Française, Oxford (MFO), 10 April 2026. Report by Michael Jewess.

William Hodson Brock graduated in chemistry from University College London (UCL) and undertook a Master's degree in history and philosophy of science at the University of Leicester, where he remained until retirement (as a Professor of History of Science and Head of History). He was one of the leading historians of chemistry in the last 50 years, and a member of the RSC and of the Historical Group. A tribute appeared to him in the summer 2025 issue of this *Newsletter* [1], and a full obituary appeared in the May 2025 issue of *Ambix* [2].

The event on 10 April 2026 was a fitting tribute to Bill, hosted at the **Maison Française, Oxford** (MFO) by Stéphane Van Damme, its Director and an historian of science. The programme included two special presentations:

one by Bernadette Bensaude-Vincent, the first recipient of SHAC's Brock Award "for outstanding contributions in the fields of the history of alchemy and chemistry"; and another by Bill's three children (Susannah Ahluwalia, Gareth Brock, and Benjamin Brock).

Speakers at the Bill Brock Meeting

Bernadette Bensaude-Vincent (Université Paris 1 – Panthéon-Sorbonne) spoke on "The history of chemistry through the lens of materials", a central theme of the history of chemistry in both of Bill's histories of chemistry from the earliest times to the present day: his long, yet highly readable *The Fontana History of Chemistry* of 1992 [3] and his *History of Chemistry: A Very Short Introduction* of 2016 [4]. Aristotle had posed the question of how two homogeneous materials could interact to form a third, distinct homogeneous material. In the twentieth century, the existence of atoms of each of around 90 (naturally-occurring) elements and of interatomic chemical bonding became the accepted explanation, but *en route* there had been four-element and five-principle theories, and numerous explanatory concepts. So fundamental are materials that some scholars have written their "biographies", for instance treating carbon, chlorine or gems as their biographical subjects.

The presentation from Bill's family was warm and enlightening and, for those who had known Bill, a fascinating complement to their own experiences. His

disciplined way of working with fixed hours and breaks, immune to distraction, allowed him to be a highly productive scholar while giving attention to family life, gardening, walking, singing, theatre and opera. His children reminisced about his humour, his preference for slightly dated vocabulary, and his disliking for the telephone while liking to have guests.

Other speakers were Eira H Betthell (University of Essex), Robert Bud (Science Museum/UCL), Julia Carr-Trebelhorn (University of Cincinnati), Matthew Eddy (University of Durham), Georgina D Hedesan (University of Oxford), Frank James (UCL and Chairman of SHAC), Michael Jewess (independent scholar), Annette Lykknes (Norwegian University of Science and Technology), Robin Mackie (Open University), Gerrylynn K Roberts (independent scholar), and Alan Rocke (Case Western Reserve University).

One speaker had collected tributes from some of Bill's other collaborators, as follows:

Brock's collegiate approach and innate modesty made him the perfect collaborator; assisting others always took priority over personal advancement."

"Brock was always ready to share his research, ideas, and contacts, welcoming new arrivals to the profession."

"Working with the great man was a treat."

"It was a privilege and a pleasure to be able to work with Bill, particularly at this point in his life ..... It is the most enjoyable paper I have ever worked on."

"Bill was a delight to collaborate with, and the world is poorer for his loss."

Two of the presentations related to Liebig and Crookes, of whom Bill had written full-length biographies. Other topics covered included SHAC, of which Bill had been chairman from 1968 to 1983, journals, professional societies, medical doctors practising chemistry, and education in the nineteenth and twentieth centuries, which Bill had particularly studied; and the magnitude and quality of his corpus of published work generally.

One intriguing novelty was presented which Bill would have appreciated: the apparently definitive identification of the lecturer in the famous Gilray cartoon of a demonstration of nitrous oxide administration at the Royal Institution at the turn of the nineteenth century, as Dr Thomas Garnett (1766–1802). The impact of poison gas on the perception of chemistry after the Great War was also discussed.

The meeting was followed by a reception sponsored by Taylor and Francis, the publishers of SHAC's journal *Ambix*, which Bill had edited from 1968 to 1983.

References

[1] Peter Morris, "Professor William Hodson ("Bill") Brock - 15 December 1936-16 February 2025", *RSC Historical Group Newsletter*, Summer 2025, 88, 10-13.

[2] Susannah Ahluwalia, Frank James, Alan Rocke, and Anna Simmons, "William Hodson ("Bill") Brock - 15 December 1936-16 February 2025", *Ambix*, 2025, 72:2, 208-230.

[3] William H Brock, *The Fontana History of Chemistry* (London: Harper Collins, 1992). The US editions were entitled *The Norton History of Chemistry* and *The Chemical Tree*.

[4] William H Brock, *The History of Chemistry: A Very Short Introduction* (Oxford: Oxford University Press, 2016).

The old quantum theory to quantum mechanics and chemical bonding in the first half of the twentieth century

Fifth International Conference on the History of Physics, Coimbra, Portugal 29-31 May 2025

Just as there is a biennial international conference on the history of chemistry [1], there is one on the history of physics. The first took place in Cambridge, England in 2014 [2], and the fifth took place in the ancient university town of Coimbra, Portugal on 29-31 May 2025 [3]. The conference theme was "Physics of the early decades of the 20th century". As a member of both the RSC Historical Group as well as the corresponding Institute of Physics group, I gave an invited presentation, "The old quantum theory to quantum mechanics and chemical bonding in the first half of the twentieth century". This is a summary of my presentation.

Chemists during the nineteenth century, above all after the International Chemical Congress in Karlsruhe of 1860, developed pictures of many molecules that are still regarded as correct today. They elucidated the topologies of molecules (which atoms were bonded to which), for instance Kekulé's ring structure of benzene. Even geometries in three dimensions were elucidated, for example tetrahedral geometries surrounding carbon atoms in many molecules. Chemists' results and those of physicists using the kinetic theory of gases overlapped, for instance in relation to the atomicity of molecules in gases and vapours.

The Bohr "planetary" model of the hydrogen atom and his electronic structures for atoms formed a basis for investigating the nature of the bonding between atoms within molecules; these structures included structures for the inert gases helium to radon, which had been isolated and

characterised since 1894. The fact that the majority of molecules had an even number of electrons stimulated the concept of the electron pair shared between atoms to form a bond between them. In many molecules the bonding achieved for the participating atoms had the stability of electronic structures identical with those of the inert gases, with two electrons in the case of helium and otherwise an outer octet. Detailed electronic structures of molecules were devised for a wide range of molecules culminating in Sidgwick's *The electronic theory of valency* of 1927, which has been described as "a masterpiece of the old quantum theory", and many of these ideas survive in 2025. A significant problem had arisen with molecules for which a special form of electron pair bond had to be devised if the outer octets were to be formed. To validate this special form, commonly known today to chemists as a "dative bond", for instance in $POCl_3$, Sidgwick, following Samuel Sugden's equation, made use of an unusually constructed and nowadays mostly forgotten molecular property, the "parachor". The expression for the parachor includes molecular weight, liquid surface tension, and liquid and vapour phase densities, with the surface tension term raised to the power ¼.

Also in 1927, Heitler and London presented a quantum-mechanical theory of the electron-pair bond. Pauling and others in the 1930s reinforced many earlier concepts of chemical bonding by quantum-mechanical calculation, and furthermore explained away some anomalies such as the magnetic moment of the O_2 molecule. In 1939, Pauling presented quantum mechanical results without their proofs for the generality of chemists in his large and influential book *The Nature of the Chemical Bond*. Pauling had available far more physical data to support his conclusions than was available to Sidgwick in 1927 – from spectroscopy, dipole moment measurements, electron diffraction, and X-ray diffraction; the parachor had outlived its usefulness. Pauling primarily considered a molecule in terms of electron-pair bonds between pairs of atoms, subject as necessary to "quantum mechanical resonance" (so that, for instance, if there were two equivalent ways of arranging the bonds, as in benzene, C_6H_6, the real

molecule could be represented by a linear equal combination of two respective hypothetical wave functions). This became known as the "valence bond" (VB) approach. Contemporarily, others developed the molecular orbital (MO) approach. Orbitals for the entire molecule were generated by linear combination of atomic orbitals, and the available electrons were allocated to these; this built in the possibility of bonding being delocalised over more than two atoms. By mid-century, the value of the MO approach was recognised, especially in relation to the treatment of molecules such as benzene. In 1954 the synthesis and characterisation of C_7H_7Br, containing the cycloheptatrienylium cation $C_7H_7^+$ (at the privately-funded, short-lived Hickrill Chemical Research Foundation in the USA), helped promote the MO theory.

This is a reprint of a report that appeared in Issue 89 of the newsletter.

Acknowledgements

My work was encouraged or assisted in its early stages by the late Professor William H. (Bill) Brock and by Professor Robert H. Crabtree, FRS.

References

[1] Martin Bigg, "14th International Conference on the History of Chemistry – chemistry and capitalism", *RSC Historical Group Newsletter*, Summer 2025, 88, 45-50.

[2] Malcolm J. Cooper, Edward A. Davis, Peter M. Schuster, Denis L. Weaire (eds.), *Proceedings of the First International Conference on the History of Physics—Trinity College Cambridge, 4–5 September 2014*,

[3] *Fifth International Conference on the History of Physics – physics of the early decades of the 20th century*

Dr Michael Jewess is an Oxford-educated scientist and a Fellow of RSC. For over 30 years, he worked in industrial scientific and legal practice. He has served on the Historical Group committee and has published widely on historical matters.

ARTICLES

End of an Era – BP in Sunbury

The news that the oil giant BP is moving its global headquarters to Timber Square, in London's Bankside will, in the Company's words, build a "simpler, stronger and more valuable BP". The move includes the technical and engineering staff currently based in Sunbury, and the closure of the site that was a UK hub for science and engineering excellence for over a Century.

Figure 1. Meadhurst House where BP set up its first laboratory in Sunbury

The site in Surrey, currently known as the as the BP International Centre for Business & Technology, ICBT, began as Sunbury Research Centre in a run-down 18th Century manor house, Meadhurst House, Figure 1. The abandoned house and three acres of land were purchased for a surprisingly modest £934 – the equivalent of a mere £56,000 based on inflation since then! It had formerly been used to house Belgian refugees from the Great War. The building was purchased in 1915 by the Anglo-Persian Oil Company (APOC, which later became BP) as a dedicated research centre for the company. The oil company already had an arrangement with East Ham Technical College in East London to train scientific and technical staff for the rapidly expanding oil company, but further primary research was limited by the college's facilities. APOC moved the head of chemistry at East Ham, Dr Albert Dunstan, and colleague Dr Frederick Thole and their families to the Meadhurst mansion. The families lived upstairs while the chemists set up their laboratory in the basement, Figure 2.

Their research remit was to discover new components in the crude oil from the APOC's oilfields and turn them into new useful products. Also the

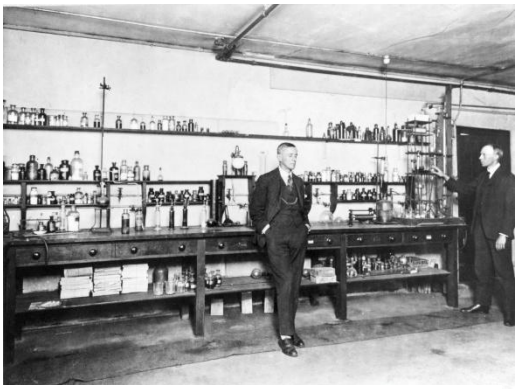
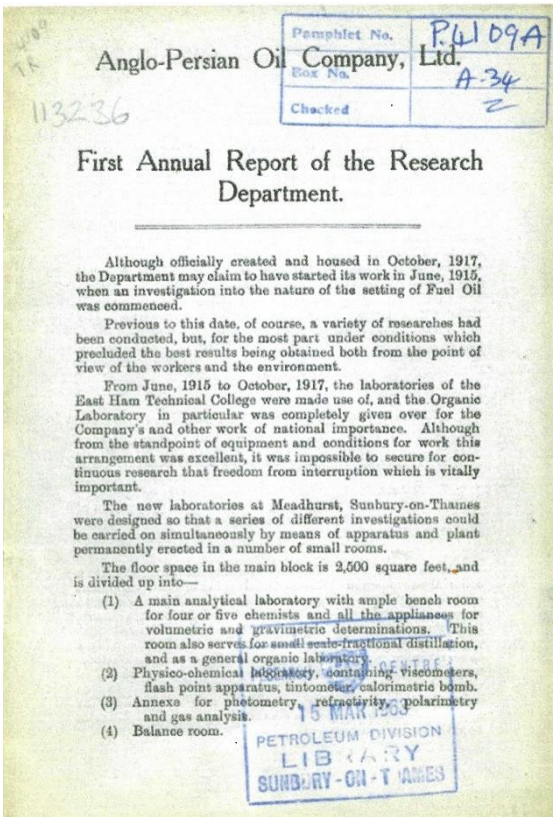


Figure 2. Dr Albert Dunstan and Dr Frederick Thole in their basement laboratory in Meadhurst House in 1918

company had secured a government contract to improve the poor performance of the country's naval fleet since its switch from coal to oil as a fuel.

The scientists produced their first annual report from Sunbury in 1918 (Figure 3). It sets out the progress made on the analytical facilities for up to five chemists. In his first Annual Report from Sunbury, Dunstan commented "it should be emphasised that one of the functions of the Research Department is to discover new components in the crude new products therefrom and new applications for them. Just as the coal tar industry has flourished because of the utilisation of waste and by-products, so in the case of petroleum it is desirable that the fullest use should be made of the wide range of chemical compounds existing therein".

Laboratory conditions were basic and Dr Dunstan even contracted pneumonia from daily working in the damp cellar at one point! However the company recognised the pioneering work being carried out in Sunbury and its commercial potential, and authorised construction of fully functioning workshops, a drawing



Anglo-Persian Oil Company, Ltd.

Pamphlet No. P.41 09A
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First Annual Report of the Research Department.

Although officially created and housed in October, 1917, the Department may claim to have started its work in June, 1915, when an investigation into the nature of the setting of Fuel Oil was commenced.

Previous to this date, of course, a variety of researches had been conducted, but, for the most part under conditions which precluded the best results being obtained both from the point of view of the workers and the environment.

From June, 1915 to October, 1917, the laboratories of the East Ham Technical College were made use of, and the Organic Laboratory in particular was completely given over for the Company's and other work of national importance. Although from the standpoint of equipment and conditions for work this arrangement was excellent, it was impossible to secure for continuous research that freedom from interruption which is vitally important.

The new laboratories at Meadhurst, Sunbury-on-Thames were designed so that a series of different investigations could be carried on simultaneously by means of apparatus and plant permanently erected in a number of small rooms.

The floor space in the main block is 2,500 square feet, and is divided up into—

(1) A main analytical laboratory with ample bench room for four or five chemists and all the appliances for volumetric and gravimetric determinations. This room also serves for small scale fractional distillation, and as a general organic laboratory.
(2) Physico-chemical laboratory, containing viscometers, flash point apparatus, tintometer, calorimetric bomb.
(3) Annexe for photometry, refractivity, polarimetry and gas analysis.
(4) Balance room.

PETROLEUM DIVISION LIBRARY SUNBURY-ON-THAMES

Figure 3. Front page of the First Annual Report of the Research Department from 1918

office and outbuildings to hold pilot plant experiments. They opened in 1921. In these early years, Dunstan and his team made considerable progress, particularly in the area of desulphurisation of oil and the capture of gas from the methane and ethane-rich Persian crude oil that flowed from APOC's wells.

In the early 1920s, the Sunbury Research Station had a strong physical chemistry bias. Much of its work supported the Company's refinery at Llandarcy, near Swansea, which began distillation operations in July 1921. The researchers developed standard methods for measuring viscosity and pour point. These, and other work documenting the behaviours of crude oil fractions, established the standardised test methods that BP employed across all its refineries.

In 1924, Dunstan became the company's chief chemist and his leadership at Sunbury was taken over by Thole.

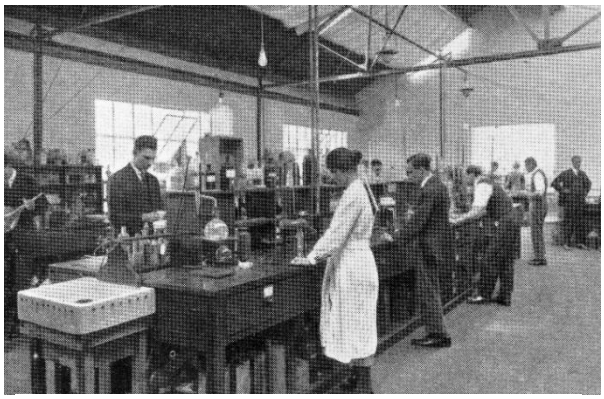

Figure 4. Main Laboratory at Sunbury Research Centre 1924

As the Middle Eastern Crude that came from the company's oilfield in Abadan, Persia, was rich in the heavier hydrocarbons, the company's scientific programme prioritised thermal cracking with the aim of increasing petrol yields from the heavier fractions for the rapidly developing motor vehicle industry. An extensive experimental programme at Sunbury was launched to investigate how thermal cracking conditions, such as temperature or residence time, affected conversion, octane properties and increased unwanted by-products. Successful cracking regimes in the laboratory were scaled up to pilot plant, where a massive amount of effort was directed towards capturing process data on thermal cracking to increase petrol yields from the heavier oil fractions.

This huge increase in collecting data came alongside an expanded programme to include pilot scale trials, materials testing, and liaison with field refineries. Driven by the commercial urgency, a massive expansion of the Sunbury site took place. A major new laboratory building opened in July 1931, and the original basement laboratory was demolished in 1936. The number of staff employed had grown to 76 by 1929, with rapid further expansion to 99 in 1934. The growth of the scientific infrastructure on the Sunbury campus and the increase in home-trained technical staff primed the organisation for its leading role in development of advanced motor and aviation fuels and other product innovations during the 1930s (Figure 5).

The Centre was responsible for introducing the first leaded fuel for motor cars in the UK, known as BP Plus, in 1931. Addition of tetraethyl lead was a game changer for the motor industry. It raised the octane ratings from 66 to 74. [Octane is a measure of a fuel's ability to withstand compression without causing "knocking" – auto-ignition of the fuel under pressure without a spark.] Higher octane allows higher compression in the engine leading to increased power, as well as improved drivability and engine efficiency. In 1933 the product was relaunched as BP Ethyl, highlighting the lead additive.

EXPERTS AT THE ANGLO-PERSIAN OIL COMPANY'S RESEARCH LABORATORIES: DR. F. B. THOLE, D.SC., F.I.C., F.C.S., EXPLAINING TO CAPTAIN MALCOLM CAMPBELL THE CONSTITUENTS OF THE NEW "B.P." PETROL.

Everyone in the motoring world is talking about the new "B.P." petrol. Our photograph shows Captain Malcolm Campbell, the famous motorist, in the research laboratories of the Anglo-Persian Oil Company, at Sunbury, hearing from Dr. F. B. Thole, D.Sc., F.I.C., F.C.S., of the Anglo-Persian Oil Company, the constituents which comprise the new "B.P." petrol.

Figure 5. Dr Thole with pioneering motorist Sir Malcolm Campbell at the Sunbury Laboratories in 1929

Despite its known environmental and health consequences, commercialisation of leaded petrol put BP at the forefront of fuel technology both in the motor and aviation markets.

The big breakthrough that put the Research Centre at the centre of aviation fuel development came at the Centre's annual chemistry conference in July

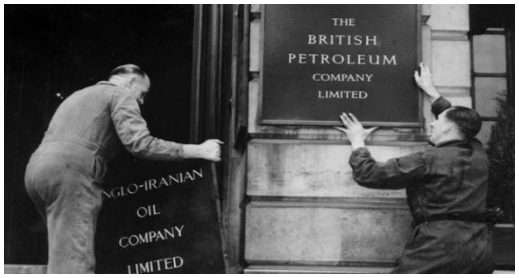

Figure 6. In 1954, after nationalisation of the Abadan oilfield in Iran, the Anglo-Iranian Oil Company

1936. Dr Thomas Tait was experimenting with ways to make iso-octane [2,2,4-trimethylpentane], the high-octane component of aviation fuel. Tait tried adding sulphuric acid in a hydrocarbon solvent such as pentane to a mixture of isobutane and butenes and surprisingly found it produced large quantities of the highly branched longer length iso-octane hydrocarbon. The highly branched structure is what confers the excellent anti-knock properties.

The refinery at Abadan had already been producing aviation standard fuel, by dimerising di-isobutene [(Isobutylene (or 2-methylpropene)] and then hydrogenating it under pressure using a catalyst.
This “surprise discovery” was quickly scaled up and by 1939 the Abadan refinery started producing alkylate aviation fuel, based on experimental production scale-up carried out at Sunbury.

In 1943, Sunbury scientists developed superfractionation, a type of continuous distillation where the smaller diameter columns allowed separation of extremely narrow ranges of hydrocarbons. It was based on theoretical work by Merrell Fenske of Pennsylvania State University, and it allowed a massive increase in the production of 100-octane aviation fuel.

The research centre’s work directly enabled 100-octane aviation fuel to be produced at Abadan at the volumes needed for Allied air operations during World War 2. (Production went from roughly 70,000 tons in 1941 to over 1 million tons by 1945). The 100-octane fuel allowed the piston engines such as the Rolls Royce Merlin engines of Spitfires to deliver a power boost that probably had a significant effect on their air combat performance.
After the war, research returned to more peaceful avenues such as improving the performance of petrol for cars. In 1954, the company finally changed its

name to BP, not least because it lost control of the Abadan oilfield in Iran which had been nationalized in 1951.

BP discovered gas in the North Sea in 1965, and in the 1970s found oil more than 3000 metres below the seabed in an area 175 kilometres from Aberdeen. The field covered 1200 square kilometres. Sunbury's Marine Sciences Group supported the engineering needed to lay the pipeline to bring to shore the oil from what came to be known as the Forties field. In the 1990s, BP sold off its chemicals operations and with this the chemical research functions at Sunbury were no longer needed. In the mid-1990s the site became the BP International Centre for Business & Technology (ICBT). However its 1800 staff will leave when it moves the engineering and commercial operations based there to its new city centre location in London by 2028.

Anna Coyle has recently taken over as Editor of this publication. She has lived in Sunbury for over 40 years.

References and Acknowledgements

Thanks to Nick Pollard of the Sunbury and Shepperton Local History Society for use of material from his presentation *The Story of BP in Sunbury*

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A Century of B.P. in Sunbury, Village Matters, August 1 2017

www.bp.com

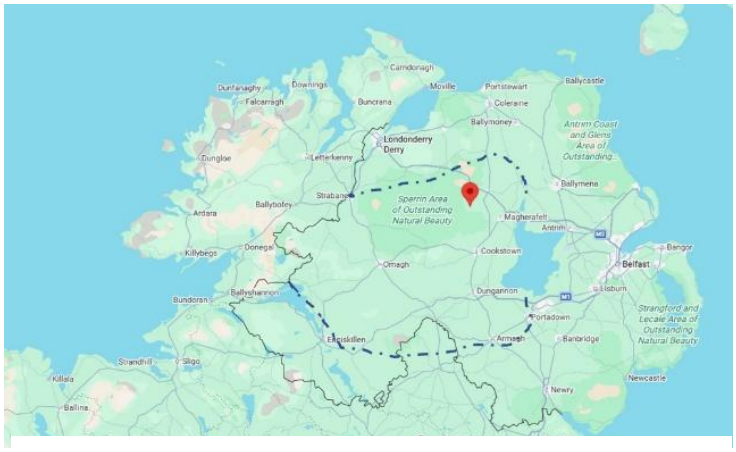
The Ether Drinkers of Ireland

In this paper Peter Morris discusses the rise of ether drinking in Ireland, its effect on the drinkers and its eventual decline. It also discusses the later drinking of ether in Polish Silesia as a parallel with similarities and differences. Peter's interest in the topic stemmed from a chance reading of an entry on ether drinking in a dictionary of Irish History [1].

Pure ether was used as a medicine largely as a result of the efforts of the physician Richard Pearson (1765–1836) of Birmingham in the 1790s and it became a standard treatment for asthma for many years. "Ether frolics" became popular in the 1830s as a replacement for the earlier laughing gas parties first introduced by Humphry Davy in 1799. These parties were largely attended by medical men and their upper-class friends and usually involved the inhalation of ether. These two strands, the recreational use of ether and its replacement of nitrous oxide, gave an American dentist William Morton the idea of using ether as anaesthetic in October 1846 (Ether Day is 16 October). [2]

Origins of Ether Drinking in Ireland

Why did ether drinking arise in Nineteenth Century Ireland? It tends to appear in areas which have a tradition of drinking spirits rather than wine or beer, where the population is mostly poor and there has been an official campaign against the illegal distillation or sale of spirts. Ireland fits the bill on all these points. The Irish drank whiskey rather than beer or wine, and hence preferred a strong drink. The British authorities carried out a major clamp-down on illegal distilling in the 1830s leading to a lack of the traditional "poteen". Father Theobald Mathew (1790–1856), an Irish Catholic priest and friar, began a total abstinence movement in April 1838. By 1845, at least three million people in Ireland (out of a total population of eight million) had taken the pledge. Most of the Irish were poor, especially during the Famine, and ether was cheap.



Map showing the extent of ether drinking. The red marker shows the location of Draperstown. (Google Maps)

Everyone who has studied ether drinking agrees it started in Draperstown in County Londonderry, which had been founded by the Drapers' Company of London in 1812. Located in the Sperrin Mountains, it had a population of 2,634 in 1841, which was mostly Roman Catholic. There are two versions of how ether drinking began there, one dating it to the early 1840s and the other to the end of that decade. The early version states it started in 1842 when an unqualified medical man called Kelly who could not drink whiskey (either because he had taken Mathew's pledge or for medical reasons) found ether in his dispensary and used it as a replacement. Finding, perhaps to his surprise, that it was to his liking, he then encouraged others to drink it. In the later version, there was a cholera outbreak in Ireland and Scotland in 1848–9. Some of the local people came back from Glasgow, where they had fled to avoid the outbreak, with an ether-based medication ("specific") for cholera which they had become fond of.

Draperstown in the early 1830s. With thanks to the Draperstown History and Heritage website.

Either way, the liking for ether clearly began in Draperstown and spread through southern County Derry and County Tyrone, and to a lesser extent, Armagh and Antrim. It was not widespread in the rest of Ireland. Both men and women drank ether and even children, and all social classes, but they were nearly always Roman Catholics – relatively few Protestants drank ether.

There does not seem to be any obvious reason why ether drinking started in Draperstown or why it remained the epicentre of ether drinking. It has been argued that it was a result of the district being poor and depressing-looking (despite being in a present-day Area of Outstanding Natural Beauty!) but this seems an unlikely explanation. It is also suggested that poteen remained more popular in other parts of Ireland, but in my view that is just putting the question in a different way rather than answering it. Nor is it clear why it remained restricted to Mid-Ulster, except possibly the proximity of Belfast as a gateway for ether made in England.

Ironically the drinking of ether was promoted by the introduction of methylated spirits in 1855–6. It was easy to use methylated spirits to make ether (and chloroform). This was called methylated ether because of its origins, but was not adulterated like methylated spirits. However, most of the ether came from manufacturers in England through the port of Belfast rather than being made locally. The drinking of ether was still going strong in the late 1880s.

Practice of Ether Drinking

It was usual, if one was not a habituated drinker, to drink ether alongside water (but not mixed with water), mainly to prevent the volatilisation of the ether in the body.

There was a well-known routine for ether drinking, known as the “ether play”: Scene I. - The mouth is washed out with cold water.

Scene II. - A draught of cold water is drunk.
Scene III - The ether is swallowed “neat.”
Scene IV. - The performance closes with a second and final drink of cold water.

It is hard to get definite figures about how many people drank ether and how much, but the government later claimed 100,000 people drank 17,000 gallons a year. That amounts to three-quarters of a litre a head or 14ml a week. The amount drunk each time is disputed. Some say about a teaspoon, others an ounce or a wine glass and some hardened drinkers were said to consume half a pint. However, as ether did not give one a hangover and one quickly recovered from drinking it, it was possible to drink ether several times a day, which complicates calculations of consumption.

Like the drinking of alcohol, the ether drinkers went through several stages but more rapidly: first excitement, then confusion, followed by loss of control and finally loss of consciousness. In contrast to spirit drinking, ether drinking caused excessive salivation, burning of the upper abdomen, and massive burping. It was also said to taste foul although this was debated. However, unlike alcohol drinking it did not cause nausea, headaches or a hangover and deaths through overdoses seem to have been rare. The major risk was death by burning because of the fumes and the burps; for example, by lighting a pipe or standing too close to a fire.

Alcohol is well known to be addictive. It is less certain that ether is addictive. There were contemporary references to people being addicted to ether in the nineteenth century, but these observers may have assumed ether was addictive because alcohol was. The key modern paper is based on the study of just one person who was already addicted to both alcohol and drugs.[3] It concluded that ether was addictive according to the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition) criteria. As ether does not cause withdrawal symptoms, it is perhaps more accurate to say it is habit-forming because of its cheapness and the lack of bad aftereffects.

The End of Ether Drinking in Ireland

Ernest Hart (1835–1898), the campaigning editor of the *British Medical Journal*, gave a talk to the newly formed Society for the Study and Cure of Inebriety in October 1890 on ether drinking, which had been hitherto largely ignored.[4] He was also chairman of the British Medical Association's Parliamentary Bills Committee. It seems that this talk received international attention. An article on Irish ether-drinking was published in the *New York Times* in November 1890 and in the *Sydney Morning Herald* in January 1891. However, it seems that it was an article in the *Christian Herald* on 26 March 1891 that finally goaded the British government into action.

The late Nineteenth Century was a period when MPs who were non-conformist Christians (the so-called dissenters) were seeking to introduce temperance in England and there was also a drive to restrict the dispensing of poisons by unqualified persons. The famous chemist Henry Enfield Roscoe (1833-1915) was involved with both these movements when he was an MP between 1885 and 1895. Given the increased attention given to ether drinking, the British Government decided to make ether a scheduled poison, although it could be argued that ether was not poisonous (and certainly less so than alcohol).

There was an exchange on this topic in the House of Commons on 20 April 1891:

MR. S. SMITH (Flintshire) I beg to ask the Chief Secretary to the Lord Lieutenant of Ireland whether his attention has been drawn to an article in the Christian Herald of 26th March, wherein it is stated that there are 46,000 ether drinkers in the North of Ireland, imbibing annually 18,000 gallons of this liquid; whether he is aware that ether is sold by chemists, publicans, grocers, and hawkers or ragmen who go through the country districts; and whether the Government can see their way to put down the sale of this drug by re-imposing the tax upon it, or otherwise?

MR. A. J. BALFOUR The hon. Member has been good enough to send me the article from the Christian Herald to which the question refers. The Local Constabulary Authorities report that from close inquiry and observation they are satisfied that the numbers given in the article in question are wholly exaggerated. The improper sale of ether as an intoxicant had been promoted through the agencies indicated in the second paragraph; but the matter having come under the notice of the Government they took prompt steps in November last to suppress it. Ether was thereupon scheduled as a poison, and can now only be sold by authorised chemists, and by them only as a poison. Inquiries show that since that time the sale has largely diminished.[5]

Thus, ether drinking came to an end in Ireland. One might have thought that some people would carry on drinking it regardless, but perhaps they had hitherto drunk it because it was both legal and moral. Its sudden disappearance also suggests that ether is not addictive. Another factor must be the fact it was imported from England and sold by wholesalers, rather than being made illegally locally like poteen, which meant the supply was more easily restricted. Nonetheless, a visiting physician from Belfast, William Calwell (1859–1943), claimed to find cases in the former ether-drinking districts in 1910, but perhaps he was fed stories by the locals to humour him. [6] Further restrictions on ether drinking were introduced by the new Northern Ireland government in the 1920s and any remaining traces of this habit then disappeared.

Ether-Drinking in Polish Silesia

Ether drinking existed in other countries notably in Norway, Russia and by Scandinavians in the USA. Perhaps the most interesting case is an outbreak of ether drinking in Polish Upper Silesia in the 1930s. [7] As in Ireland, its cheapness was a major factor; it was drunk by the poor (peasants and miners) and their poverty was increased by the Depression. Government

action was also a factor. The Polish government had introduced a state alcohol monopoly in 1924 which made alcoholic drinks more expensive. Another similarity with Ireland was the drinking of ether by children.

However, the drinking of ether had been made illegal in 1923 and hence, unlike Ireland, it was an underground activity. Like Ireland, the ether came from outside the country, in this case from Germany. Ether drinking was popular up to the outbreak of war in 1939, but died out after the Second World War. The German border had been moved two hundred miles to the west and ether was no longer available by that route. The state had introduced a socialist economy and a secret police force; hence it became much more difficult to make ether in secret.

Imbibing Ether Indirectly

From Grace's Guide to British Industrial History

Victory V lozenges were invented in 1864 by Thomas Fryer and Edward Smith MD and made in a factory in Nelson, Lancashire. [8] They contained ether, liquorice and chlorodyne (a patent medicine containing laudanum, cannabis and chloroform). I remember them very well from the early 1960s and they were certainly very powerful – the smell and taste of the ether was particularly noticeable. Sometime after that, the ether and chloroform were removed (presumably along with the cannabis and opium). However, the makers cunningly devised a flavouring which smells and tastes like ether. Victory V is now manufactured in Devon by a subsidiary of Mondelez International.

Conclusions

The ether story is at least partly one of unintended consequences on the part of the state. By clamping down on illegal distilling and introducing methylated spirits, the government unwittingly promoted ether drinking. Father Mathew also had no idea that he would encourage ether drinking by discouraging the imbibing of alcoholic beverages. This is a point made by Richard Davenport-Hines in *The Pursuit of Oblivion*, both for ether drinking and drugs generally.[9]

It is also striking that ether drinking in Ireland was not restricted to a niche group, such as teenagers, or a particularly deprived or depraved section of the community. However, it was limited to a specific area even within Ulster and it would be fascinating to know why this was the case. It is also remarkable that the ether-drinkers did not attempt to defy the authorities, despite Ireland having a culture of illegal distillation and the Roman Catholics having little love for Dublin Castle (or Stormont).

Professor David Nutt, the former chairman of the Advisory Council on the Misuse of Drugs, has long argued that alcohol is by far the most dangerous intoxicant in society and that it makes little sense to clamp down on other drugs while doing relatively little about alcohol. Ether drinking would appear to support his case. It does not have aftereffects and while it may encourage anti-social behaviour as much as alcohol because of the loss of inhibition, I have not come across any suggestion that it makes people violent. Nor, remarkably, did it seem to cause early death, as long as the drinker did not approach naked flames!

The anaesthetist David Zuck (1923–2016) seems to have reached a similar conclusion in his talk on ether drinking to the History of Anaesthesia Society in October 2008 with his usual dry wit:

In conclusion, in view of the current popularity of binge drinking, where the object is to get drunk as quickly as possible, and of the rapid effect of ether taken by mouth, one wonders whether the introduction of ether saloons or bars might not serve a valuable social purpose, both by getting lager louts off the streets, and providing employment for retired anaesthetists. [10]

Sources

The longest account of Irish ether drinking is given by Kenneth H. Connell in an essay "Ether Drinking in Ulster" reproduced in his *Irish Peasant Society*, (Oxford: Clarendon Press, 1968), 87–111. He mentions the "late origin" of ether drinking in Draperstown as a possibility, the ether being obtained in England rather than Ireland, and its geographical spread. It is unusual in having been written by a pioneering social historian rather than a scientist or a physician.

Robert A. Strickland, "Ether drinking in Ireland", *Mayo Clinic Proceedings*, 1996, **71**, no. 10, 1015, David Linden on the *Psychology Today* website, gives the "early origin" for ether drinking in Draperstown and the history of ether drinking more generally.

Peter J. T. Morris *is an honorary research fellow at the Science Museum, London, and University College London. His interest in Irish history arose as a result of writing a biography of Henry Enfield Roscoe (with Peter Reed) and the impact of the Irish Home Rule controversy on Roscoe's parliamentary career.*

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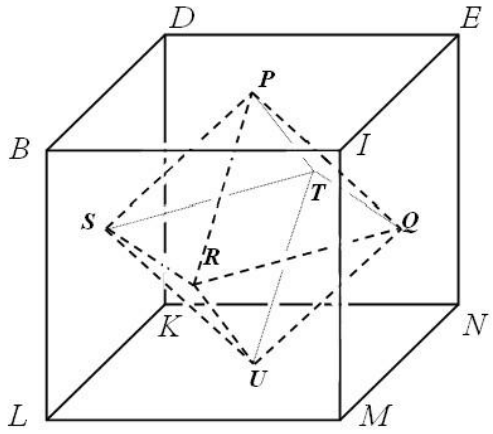
MEMBERS' PUBLICATIONS

René-Just Haüy (1743-1822): early difficulties with chemistry, some successes with geometry, and an unresolved tension

Michael Jewess (with Carmen Schmechel), *Bull. Hist. Chem.*, 2026, 51(1), 144-156

In 1784, René-Just Haüy published Essai d'une théorie sur la structure des crystaux, which has been justifiably considered to have established the study of crystals as a "discernable science". Since antiquity, naturally occurring crystals had been admired for their planar faces and their

reflective and refractive optical properties; but, having grown under various geological conditions, they display irregularities and variations of shape, and these need to be excluded from consideration in order to arrive at systematic understanding. It was already known that the measured angles between the faces were consistent despite such irregularities and variations, and this was the starting point for Haüy, who in his Essay showed how the interfacial angles could be correlated by means of geometry and trigonometry. His archetypal example was the relatively simple one of fluorite, CaF2, the faces of crystals of which, and the cleavage planes of which, could be related to one another by reference to a cube and an inscribed octahedron as shown in the Figure. Thus for instance an observed cleavage angle of approximately 54½º corresponds to angle ∠IPM, calculated as arctan √2 = 54º 44′. (The modern crystallographer would note in addition that the cube and the octahedron have the same symmetry elements.)



Haüy then proceeded with similar geometrical and trigonometrical rationalisations of interfacial angles in minerals such as calcite and topaz where the symmetry is non-cubic and where the mathematics is far more complex.

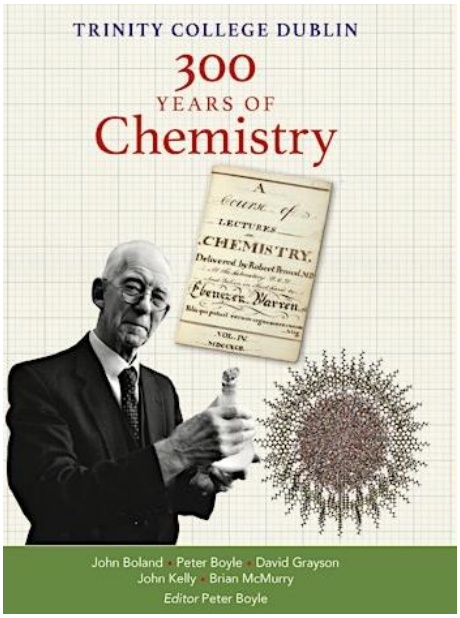
In 1784, it seems that Haüy lacked appreciation of chemistry (then prevailingly phlogistic). In contrast, his final edition of Traité de minéralogie in five volumes (published at least partly posthumously in 1822-3) used Lavoisierian chemistry as the primary classification tool for over two hundred minerals, for each of which he describes the various outward crystalline geometries (today called “habits”).

However, even in this final work, Haüy doubts that chemistry is uniquely fundamental. This is because he adhered in essence to a (then plausible) hypothesis in his 1784 work that the outward appearance of a crystal had a simple relationship to the shape of the molecules of which it was composed. Haüy's hypothesis was not accepted by his celebrated contemporary Jöns Jacob Berzelius (1779-1848); it was abandoned later in the nineteenth century; and it was proved wrong in the twentieth by X-ray crystallography.

BOOK REVIEWS

Trinity College Dublin: 300 years of chemistry, Dublin: Hinds, 2025, ed. Peter Boyle

Available for €30inc. p&p from the publisher Ross.Hinds@hinds.ie.



Trinity College Dublin (TCD) has a chemistry department rated in the top 100 in the world, a considerable achievement for a small country like Ireland, and for a small, but top-rated university in international terms. It is also one of the oldest chemistry departments in the world, having first appointed a Professor of Chemistry in 1711. This book commemorates the 300 years of chemistry in Dublin and is dedicated to Dr Mary Carson, the first woman lecturer in the Department, who worked at TCD from 1967 until her retirement in 2000. She died in 2019 and left a legacy to the department which helped to fund this book. This detailed and profusely illustrated book is a worthy tribute to the long and distinguished history of chemistry at TCD. Each of the six chapters

cover a period of its history and is authored by past staff members. Sadly, Brian McMurry did not live to see its publication. The six chapters are:

- Chemistry, the handmaid of medicine 1711-1844 (Peter Boyle)
- A new era 1844-1903 (Peter Boyle)
- Young and Werner 1903-1947 (Brian McMurry)
- The Cocker years 1947-1978 (David Grayson)
- The department in transition 1978-2000 (John Kelly)
- The new millennium 2001-2022 (John Boland)

Until 1844 chemistry at TCD was an adjunct to medicine and all the early professors were doctors. After this suitably qualified chemists took over. Its history as a centre of chemical excellence, in teaching and research, can be summed up as BC – Before Cocker – and AC – after Cocker. Wesley Cocker (1908-2007), a Lancastrian, was recruited as Professor Chemistry in 1947, in the aftermath of WW2. He remained as head of department until he retired in 1978. Figure 1 shows the chemistry staff in 1978.

Figure 1. The chemistry staff at Trinity College Dublin in 1978, the year of Professor Cocker's retirement. (Fig. 5.1 in the book)

When Cocker took over there were four members of staff and the department was mainly concerned with service teaching, with little or no research, and poor physical facilities. Professor Cocker transformed the department and laid the foundation for its future growth and commitment to top-level research. He started the process to turn the department into a modern, research-focused centre with an international reputation. An appendix lists the PhDs awarded from 1950 to 2021: in 1950

there was one PhD; in 2021, 25. Initially most PhDs were in organic chemistry but now they reflect a wide range of modern topics in all branches of chemistry. Professor Cocker continued to be active in research and publication long after his retirement. He is commemorated by the Cocker Prize (1950-), the Cocker Teaching Laboratory (1996), the SOCI Welsey Cocker Award (2008-) and the TCD Cocker Lecture (2021-). Professor Cocker wrote his own detailed account of chemistry at TCD in an article when he retired (Cocker, 1978).

Scientific research in Ireland was poorly funded until 2000 but since then the increased support for universities, for facilities, equipment and student scholarships has transformed the research scene in Ireland. All Irish chemistry departments have benefited from the increased funding, probably TCD and University College Dublin most of all. Ireland's international reputation as a location for biopharma companies has also helped to promote the training of chemists and chemical research.

Figure 2: The old chemistry building at Trinity College Dublin

For a small country Ireland is punching well above its weight, thanks to support from Research Ireland and the EU. The number of chemistry staff has grown from four in 1947 to 14 in 1978, to 24 today, with a concomitant growth in the number of research students. The last two chapters give a good overview of the development of research in the Department, especially since 2000. It is noteworthy that staff have been recruited from many countries, and this is also reflected in the composition of the postgraduate students. The chemistry department has long since expanded out of the 1887 building (Figure 2) that was familiar to generations of chemistry students, and its staff are now located on six different sites. TCD chemistry graduates have gone on to distinguished careers in academia, industry, business and teaching.

This book will be of particular interest to TCD chemistry graduates and postgraduates and present and past staff. It should also be of interest to anyone interested in the history of chemistry in Ireland and TCDs important role in that history. It is worth browsing for the wealth of photos it contains. Randal Henly has written an interesting article online about his time at TCD (Henly, 2023). One of the staff, Dr Roy Brown, was a great friend of the Irish Science Teachers' Association and a frequent speaker to chemistry teachers. He taught chemistry to pre-med students from 1962 until his retirement in 1995.

Other Sources

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Peter J.T. Morris, The Historical Group of the Royal Society of Chemistry: A History from 1975 to 2024

Historical Group Occasional Papers, No. 11. 64 pages, available as a PDF or hard copy on request

Groups devoted to the history of chemistry exist in several countries, mainly in three different forms. They can be sections within societies on the history of science, or sections within chemical societies, or stand-alone societies. Before the RSC's Historical Group was launched in 1975, there were already groups in Germany (1908-1945, re-established in 1961), the USA (1921) within the national chemical societies, and a group in Japan (1973) that germinated within the Japanese History of Science Society. The Society for

the Study of Alchemy and Early Chemistry established in 1935 – with its journal *Ambix* since 1937 – was also independent.

In 1975 the chemist and historian of science Stephen Mason took the initiative to form a Historical Group (HG) within the RSC, to create a home for the history of (modern) chemistry. Early on the Group was driven by Colin Russell and Alec Campbell. The relation between the group and SHAC is one of the running themes in Morris's lucidly written informative book.

Morris's book is unique. No other group has produced a similar well-informed, detailed, and densely packed historical overview. It is unique because it is written as an eye-witness account. As a first-year student in Oxford, Morris became a member of the HG from the start (p. 3). As officer of the HG, and as one the leading historians of chemistry, he served the HG between 1988 and 2025 in many different roles: as secretary, delegate to the European Working Party, membership secretary, newsletter editor, treasurer and chair. Outsiders will perhaps be overwhelmed by the overload of information on the development of the HG in only 36 pages, to which more than 20 well-structured pages with appendices are added. But for insiders it will be a trip down memory lane, not least because of the numerous well-chosen pictures, including those of the young Colin Russell, p. 5, and David Knight, p. 24. It is written with much humour. When Alan Dronsfield, another key officer, wrote a protest letter about the closure of the Science Museum Library to the *Daily Telegraph*, Morris notes that this "made Lord Waldegrave (chair of the Trustees) choke on his cornflakes at breakfast, thereby forcing the museum's senior leadership to change course." (p. 22)

Looking from a greater distance to all that the HG achieved during half a century, one becomes baffled by the number of meetings organized (about 150) – including two abroad in Paris (1992) and Leiden (2004) – as well as by the wide range of subjects covered (pp. 49-59). The HG became one of the most active historical groups in Europe. The HG clearly profits from the large networks of the Committee members, as a result of which it succeeds in co-

organising many joint meetings, with SHAC and the Royal Institution in particular. The membership of the HG Committee is remarkable having included the *crème de la crème* among the British historians of chemistry, for example Colin Russell, David Knight, John Brooke, Peter Morris, Robert Anderson and Alec Campbell, but also several leading chemists, such as Mary Archer and John Rowlinson, while Nobel Laureate John Cornforth gave a lecture. During the Covid pandemic the HG organized online lectures, which are ongoing. In recent years it also succeeded in attraction young new Committee-members a problem other European history of chemistry groups struggle with.

This is a narrative history rather than a thematic one. A question not addressed is "Why should we start initiatives on the history of chemistry?" There are many different answers. During a meeting of the European Working Party for History of Chemistry in 1981 in Bucharest, Colin Russell emphasised that modern methods of teaching history of chemistry should be introduced at schools and universities. "In our age the interest for natural sciences and even for chemistry seems to decrease", and he argued that "one of its causes is the omission of the human side of these sciences." Educational motives did play a role during the birth of the HG (pp. 1, 3), but in the rest of his text Morris addresses that issue only in passing (e.g. the historical wallcharts on pp. 20-21), although it was the topic of four meetings held between1980 and 1990. Elsewhere in Europe, the problem enunciated by Russell in 1981 was a major reason for the formation of national history of chemistry groups, for instances in the GDR (1976), Italy (1985), Spain (1986), Denmark (1989), Belgium (1989) and France (1990). As result, while the HG in 1975 had been one of a few pioneers, in 1990 is had become part of a large European family.

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