

# CHEMICAL INTELLIGENCE

Winter  
2020 issue

Society for the History  
of Alchemy and Chemistry



# Follow AMBIX on twitter!

SHAC's twitter account is now joined by a new account for its journal AMBIX. Many historians of science and chemical and historical institutions and societies are now using twitter. Members who have not ventured into social media cyberspace may be surprised by the interesting information and debates now going on in the twittersphere!

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## Women and Chemistry

SHAC Spring meeting  
Saturday 16 May 2020  
at University College London

In recent years the significant roles that women have played in chemistry have become ever more apparent. For example, the chemical researches of specific women (most of whom have been neglected in the historical literature until now) have been explored as well as understanding the vital function of women as active 'consumers' of chemical knowledge. This meeting will discuss these and other issues from a variety of perspectives, including societies, commerce etc. There will also be a round-table discussion on these themes. The programme will be available on the SHAC website in the near future. Offers of papers (title plus short abstract) or for participation in the round-table should be sent to Frank James ([frank.james@ucl.ac.uk](mailto:frank.james@ucl.ac.uk)) as soon as possible.

## Women in their Element

Tuesday 11 February 2020,  
Knowledge Centre, British Library,  
13.00 to 17.00

SHAC is supporting a British Library and World Scientific Publishing Company Event, *Women in their Element*, which is part of the WISE Festival, celebrating the International Day of Women and Girls in Science.

The co-editors and contributors of the recently published *Women in Their Element* provide a fresh perspective on the unsung contributors to science in this half-day seminar on women and the Periodic Table.

Published in the International Year of the Periodic Table, 2019, *Women in their Element* offers an original viewpoint on the history of the Periodic Table: a collected volume with short illustrated papers on women and their contributions to the building and the understanding of the periodic table and of the elements themselves. Edited by Annette Lykknes and Brigitte Van Tiggelen, this book will help make historical women chemists more visible, as well as shed light on the multifaceted character of the work on the chemical elements and their periodic relationships.

For further details and information on how to book a British Library event please visit: <https://www.bl.uk/events/women-in-their-element#>





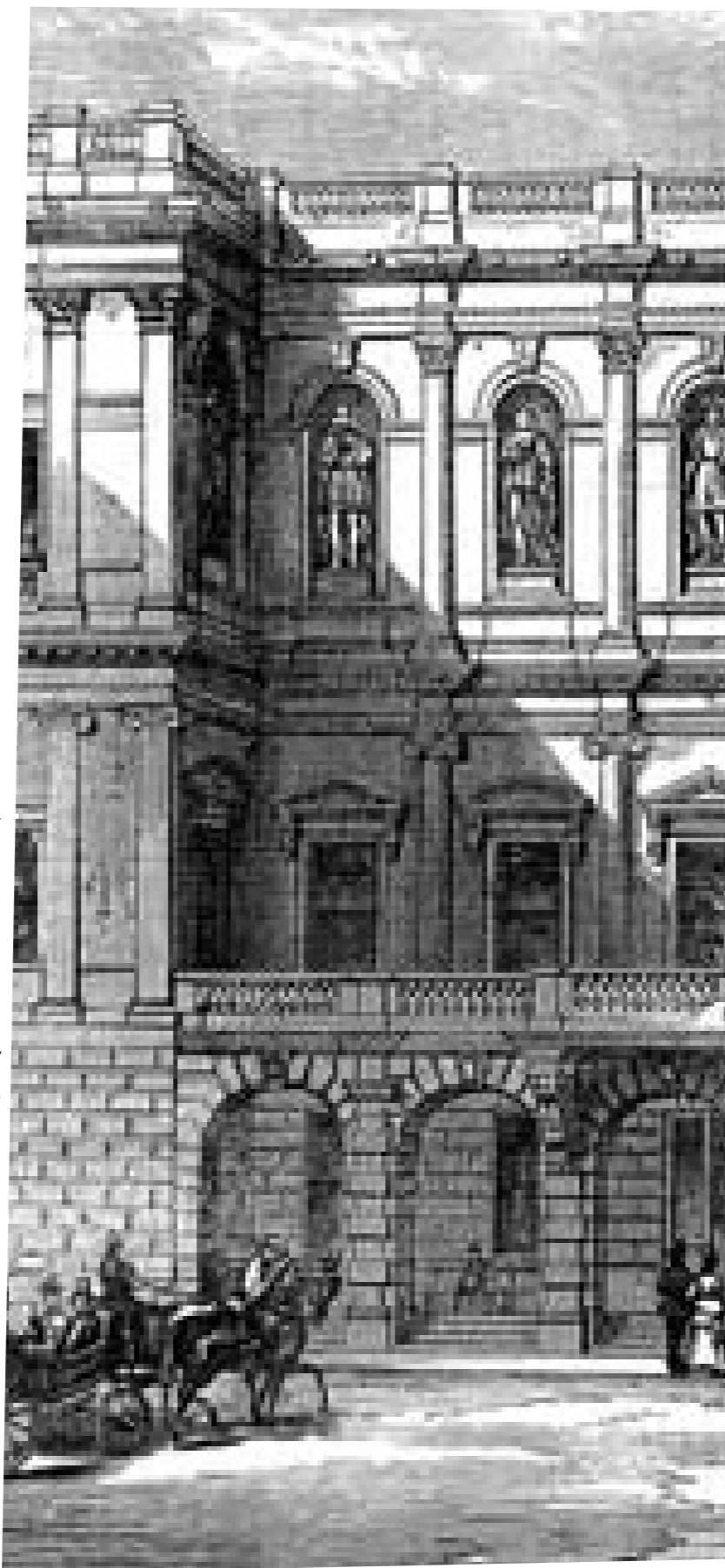
# Royal Society of Chemistry Historical Group

## THE HANDED WORLD: 150 YEARS OF CHIRAL MOLECULES

The meeting will review optical activity and molecular chirality from a historical perspective – beginning in the nineteenth century and ending with techniques that are used today in the latest facilities such as the Diamond Light Source, with special reference to the biological and pharmaceutical importance of chirality. Fuller details are available at <http://www.rsc.org/events/detail/40046/the-handed-world-150-years-of-chiral-molecules>.

**REGISTRATION:** There is no charge for this meeting, but prior registration is essential. Please use the “BOOK NOW” button at <http://www.rsc.org/events/detail/40046/the-handed-world-150-years-of-chiral-molecules>, or e-mail [michael-jewess@researchinip.com](mailto:michael-jewess@researchinip.com), or write to Dr Michael Jewess, The Long Barn, Townsend, Harwell, Oxon OX11 0DX.

As usual, this is expected to be a popular meeting, so if, having registered, you are unable to attend, please cancel through the link provided in the confirmation e-mail (if you have used the “BOOK NOW” button) or by notifying Dr Jewess.



# Programme

10.15 Registration and tea or coffee

10.45 Welcome – Dr Peter Morris (Historical Group, Chair)

First session: introduction; the science to about 1890, with postscripts  
Chair Dr John Hudson (Historical Group Committee)

10.49 Introduction to the day  
Dr Michael Jewess (Historical Group Committee)

10.55 Discovery of the phenomenon of polarisation of light  
Prof. John Steeds, FRS (University of Bristol)

11.35 Discovery of optical activity and chirality in molecules  
Prof. Alan Dronsfield (University of Derby)

12.30 Lunch: this is not provided but there are many cafés and bars close by.

Second session: the science from about 1890  
Chair Dr Michael Jewess

14.00 From d and l to R and S: discovery of absolute configuration  
Prof. Henry Rzepa (Imperial College)

14.30 Polarised light and chemistry today  
Dr Giuliano Siligardi (Diamond Light Source)

15.15 Tea

Third session: chirality and pharmaceuticals in recent decades; conclusion  
Chair Dr Viviane Quirke (Oxford Brookes University)

15.45 Does the right hand know what the left hand is doing? – chirality in real life  
Dr Ian Blagbrough (University of Bath)

16.55 Concluding remarks – Dr Michael Jewess

17.00 Close – Dr Peter Morris



# INTERNATIONAL CONFERENCE ON THE HISTORY OF CHEMISTRY 13 ICHC

The 13 ICHC in Vilnius will be organised by the EuChemS Working Party on History of Chemistry in conjunction with the Belorussian-Lithuanian-Polish Andrzej Sniadecki Memorial Conference “Frontiers in Molecular Life Sciences”. The conference will invite historians of chemistry from Europe and other countries of the world to discuss all aspects and periods relating to the History of Chemistry, including good practical examples of teaching the history of chemistry.

The conference program will include scientific sessions, key-note lectures, the WP business meeting, a poster session (in conjunction with the posters of the conference “Frontiers in Molecular Life Sciences”) as well as social events such as excursions, receptions, and a conference dinner banquet. Key-note lectures and the call for paper will be announced later.

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Society for the History of Alchemy and Chemistry Award Scheme 2020.

Opening date: 1 March 2020

Closing date for applications:

31 May 2020

The Society for the History of Alchemy and Chemistry invites applications for its Award Scheme for 2020. SHAC offers two types of award: support for research into the history of chemistry or history of alchemy by both new and independent scholars and support for Subject Development of either history of chemistry or history of alchemy. It is expected that applicants will be advised of the outcome of their application by 31 July 2020. The Awards are most suitable for activities to be undertaken in the academic year October 2020–September 2021.

awards

scheme

New Scholars Awards/Research Awards are open to post-graduate students (both masters and doctoral students), those who have obtained a PhD since 1 January 2010 and also to independent scholars. Awards of up to £750 will be made to cover research expenses, including travel, accommodation, the reproduction of documents, and library fees. Applications may also include the costs of reproducing images for publication. The Scheme does not fund the purchase of equipment or course fees. It does not cover the costs of Open Access publication.

Please note that from 2020 the cut-off for early-career scholars has been extended from five years post PhD to ten years post PhD. Independent scholars are also eligible to apply for what were formerly known as New Scholars Awards. Given that the circumstances of independent scholars differ we are letting members 'self-define' and if there are any unclear cases it will be left to the discretion of the Awards Panel. In addition, post-graduate students only may apply for the costs of travel to conferences and accommodation, but only in order to give a paper. The Scheme does not pay conference registration fees.

Subject Development Awards of up to £750 may be made to support activities such as seminars, workshops, colloquia, lecture series, conference sessions, conferences, exhibitions and outreach activities that support either the history of chemistry or history of alchemy as academic subjects. The Awards do not cover the costs of refreshments or catering for these events. The Scheme does not cover the costs of Open Access publication.

Please note that activities covered by the Awards do not have to occur in the UK, and that the Awards are open to members of the Society resident both in the UK and elsewhere. Members who have applied to the Scheme in previous years, whether successfully or not, are entitled to make an application in 2020.

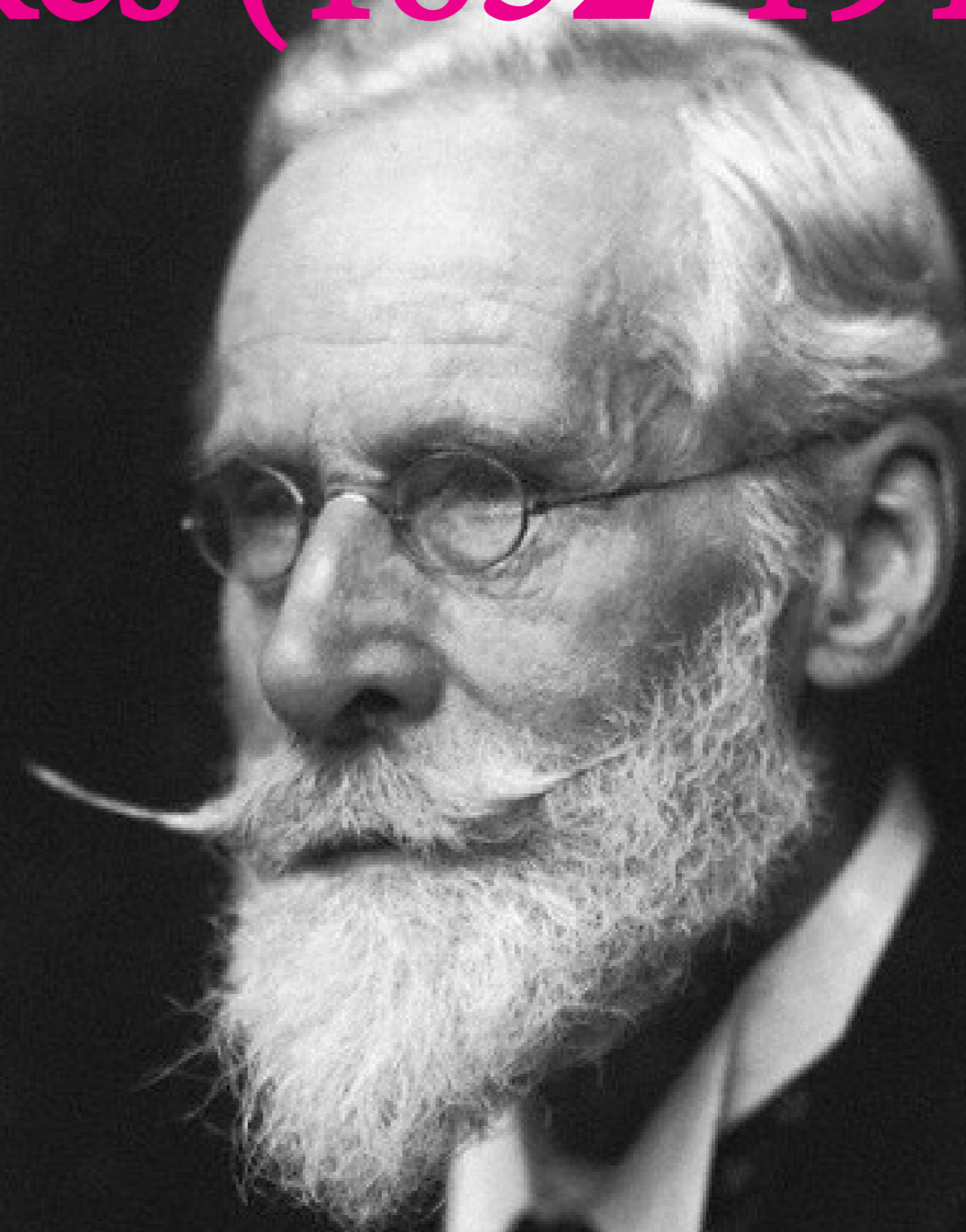
Applicants must be members of the Society in good standing at the time of making an application, and, if successful, throughout the period of an award. For more information and application forms, please contact [grants@ambix.org](mailto:grants@ambix.org) after the Award Scheme opens on 1 March 2020. Membership enquiries should be made to [newjoiner@ambix.org](mailto:newjoiner@ambix.org).

An activity report must be submitted at the end of the Award. This will usually be published in SHAC's *Chemical Intelligence* newsletter.

# William Crookes (1832-1919)

Saturday 19 October 2019,  
Royal Institution

REPORT: 2019 marked the centenary of the death of William Crookes. Journalist, chemist, photographer, spiritualist, businessman, sometime Secretary of the Royal Institution and President of the Royal Society of London, Crookes was a key figure in the science of the second half of the nineteenth century and beginning of the twentieth. On 19 October 2019 the Society for the History of Alchemy and Chemistry, the Royal Society of Chemistry Historical Group and the Royal Institution marked this anniversary by holding a meeting at the Royal Institution to examine various aspects of Crookes's extraordinary career and his place in science. Over fifty people attended the meeting, which was also part of the ChemFest celebrations of the sesquicentenary of the periodic table.



## **‘Two Parallel Lines’? The Trajectories of Physical and Psychical Research in the Work of William Crookes** Richard Noakes (Exeter University)

In 1905 the English journalist Harold Begbie interviewed William Crookes for a leading magazine of fashionable London society. Begbie gathered from Crookes’s responses that the veteran chemist regarded “physics and psychics” as “two parallel lines” that could never nurture each other. Yet Crookes seemed to hold out hope that parallelism would eventually turn to convergence with physicists’ studies of the apparently immaterial basis of matter and psychical researchers’ studies of the physiological basis of telepathy.

Noakes’ paper argues that Begbie was either misunderstanding Crookes or Crookes was being disingenuous because Crookes’s approaches to psychical phenomena had been strongly physical since the 1870s when he began systematically investigating spiritualism. This was explored in relation to Crookes’ investigations of an apparent ‘psychic force’ exuded by the body, materialised spirit forms and ‘brain wave’ theories of telepathy.

## **William Crookes: A Life in Photo-chemistry** Kelley Wilder (De Montfort University, Leicester)

Sir William Crookes was a well-known photographer at the beginning of his career, but he is best known for his other achievements, later in life. Wilder’s paper argued that Crookes’ photographic knowledge and practices informed his experimental career throughout his life, even after he apparently left the mainstream photographic circles. Using notebooks and recently discovered caches of photographs, she argued for a rethinking of Crookes’ use of photography throughout his lifetime, showing how everything, from his note-taking to his experimental practices was indebted to photographic practices. While half the notebooks remain secluded in the Science Museum due to concerns over radioactivity, this study will remain incomplete, but it is suggestive of new directions in understanding Crookes’ various activities throughout his scientific career.

## **George Gabriel Stokes (1819-1903) - Crookes’s “Invisible Helper”** Paul Ranford (UCL)

The title of this talk was taken from William Brock’s biography of the British physicist William Crookes (1832-1919) in which Brock described Stokes as “one of Crookes’ many ‘invisible’ helpers” (W.H. Brock, *William Crookes (1832-1919) and the Commercialization of Science*, London: Routledge, 2016, p. 11).

Crookes himself seemed in no doubt about the value of Stokes’ to his work – in 1907 he admitted (perhaps with some hyperbole) that “...if what I owe to Stokes is deducted from my work there will be precious little left I can claim for my own!” (Crookes, in Larmor, *Stokes – Memoir and Scientific Correspondence Vol. 1*, Cambridge: CUP, 1907, p. 362) This talk demonstrated the very significant impact of Stokes on Crookes’ scientific work, an impact which Ranford argues is inadequately recognised in the historical literature.

George Gabriel Stokes was an Irish-born physicist and mathematician, best known for his contributions to fluid-flow theory (the “Navier-Stokes” equations) and his discovery of fluorescence. He withdrew from his own original researches shortly after becoming joint-Secretary of the Royal Society to undertake a long period of administration in British science, culminating in his Presidency of the Royal Society from 1885 to 1890. Throughout his time as joint-Secretary, Stokes acted as Editor of the Royal Society’s main and highly prestigious scientific publications, *Transactions* and *Proceedings*. In scientific politics this was an enormously powerful position in which Stokes provided significant (if often inconspicuous) contributions of experimental ideas and rigorous mathematical theory to the work of Victorian

scientists. Of all of these, Crookes’ debt to Stokes seems the greatest bar that owed by Stokes’ closer – and even more influential – friend William Thomson (later Lord Kelvin).

The significance to science of the collaborative relationship between Crookes and Stokes is evident from their correspondence, comprising over 200 letters spanning the period from 1856 to 1901. Stokes’ input involved the provision of mathematical theory and suggestions of practical techniques to underpin and extend Crookes’ experimental results. He provided solutions to problems of precision measurement, helped Crookes to avoid error in the interpretation of experiments on the radiometer and other apparatus, and resisted his submissions of papers favourably reporting fraudulent spiritualist claims made by mediums and table-turners. (It seems likely that this resistance was as much a consequence of Stokes’ convictions as a devout evangelical Christian on the state of the human spirit after death, as it was of the need to avoid controversy in RS publications.)





**William Crookes and Michael Faraday**  
Frank James (Royal Institution and UCL)

In this talk James considered the three main interactions in the 1850s and 1860s between Crookes and Faraday, his senior by some forty years. According to a much later account by Crookes, he first met Faraday at a couple of table-turning seances arranged in June 1853 by the Secretary of the Royal Institution and close friend of Faraday's, John Barlow, whom Crookes later described as his pupil at the Royal College of Chemistry. Unfortunately, Faraday's notes of the seances do not refer explicitly to Crookes's presence. At these meetings Faraday demonstrated versions of the detector that he had devised to show what he regarded as the unconscious involuntary motions of the table-turners in causing the effect. At this point it is doubtful if Crookes was much concerned with such phenomena, but later used Faraday's work as a justification for his own scientific study of them. Their second interaction was Crookes's role in publishing the last two series of Faraday's Christmas Lectures for juveniles at the Royal Institution delivered in 1859/60 and 1860/61. Until then Faraday had resisted all (including some very generous) offers to publish his lectures, believing that the printed text could not convey the vivacity lectures. James suggested that he may have changed his mind to contribute to improving public scientific knowledge, the want of which had been evinced, in his view, during 1853 (and after), by the widely held belief in

table-turning and related phenomena. Crookes was especially keen to obtain copy for his weekly *Chemical News* (begun at the end of 1859) and was only too pleased to publish not only almost verbatim accounts of Friday Evening Discourses at the Royal Institution, but also persuaded Faraday to let him publish his Christmas Lectures. This culminated in the publication of *The Chemical History of a Candle*, which by being continuously in print since 1861 and translated into more than a dozen languages, is arguably the most popular science book ever published. The final interaction between Faraday and Crookes involved the latter's spectroscopic discovery of the chemical element thallium in 1862, which, much to Crookes's annoyance, was also credited to the French chemist Claude-Auguste Lamy. Faraday helped support Crookes's claim by, for example, undertaking magnetic studies of the new metal, but also by nominating him, successfully, from personal knowledge, to be elected a Fellow of the Royal Society of London. Thus, through these three areas Faraday played a significant role in developing Crookes's early career, from which he never looked back.

“According to a much later account by Crookes, he first met Faraday at a couple of table-turning seances arranged in June 1853”



## The Key to the Deepest Mystery of Nature: Crookes, Periodicity and the Genesis and Evolution of the Elements

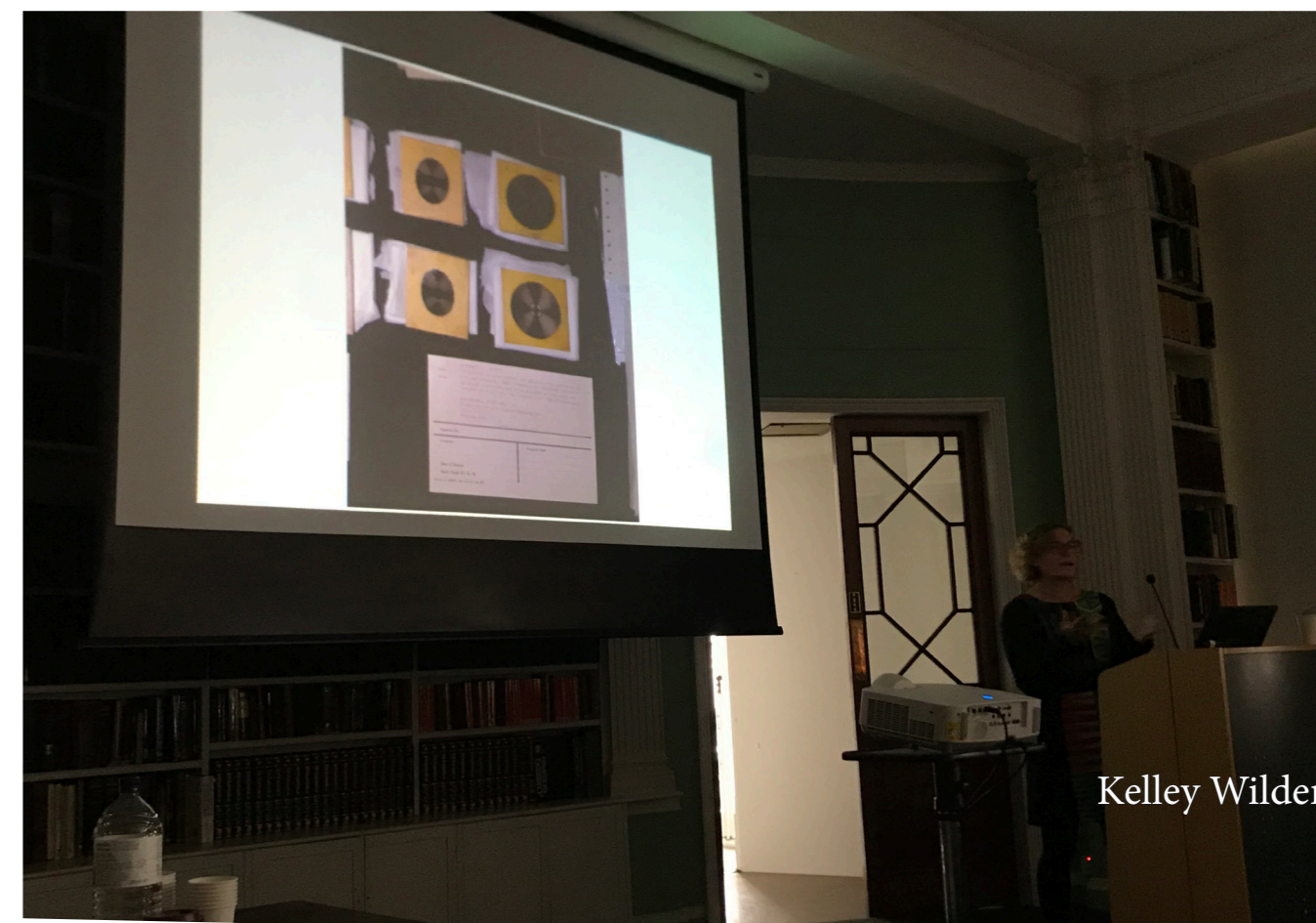
William Brock (University of Leicester)

By the mid-1880s the periodic system was being used in teaching in most of the UK's schools of chemistry. Following the identification of Mendeleev's predicted elements (gallium, 1875; scandium, 1879), Crookes had translated from the French, and serialised, a long French paper of Mendeleev's that extolled the value of the table. Typical of tables in the 1880s was the grid of seven horizontal periods and eight vertical groups used by the Irish chemist J. Emerson Reynolds at Trinity College Dublin. Reynolds was well aware that that there had been speculations by the astronomer Norman Lockyer, the Canadian geochemist Sterry Hunt, and the Dundee chemist Thomas Carnelley that the periodic system seemed to imply that so-called elements were compounds. Indeed, contemporary organic chemists often drew attention to the analogy between the periodic table and homology in the paraffin series of hydrocarbons. Reynolds appears to have resisted such speculations, apart from drawing attention to the anomaly of hydrogen which sat in isolation in the first period. This did encourage him to ponder whether there were unknown lighter elements than hydrogen, of which the solar helium (not yet identified terrestrially) might be an example.

Crookes had always been fascinated by Prout's hypothesis that the elements might be composed from an extremely light fundamental material, protyle, and the run of his *Chemical News* shows him frequently giving house room to speculations about its validity. He was also a convinced believer in Darwin's theory of evolution. In the Spring of 1886 Crookes found himself in Dublin on business and called on Reynolds. He was struck by an unusual "zig-zag" form of the periodic table that was fixed to the laboratory wall for teaching purposes and requested Reynolds to write up an explanation for readers of *Chemical News*. The chart and explanation appeared on 2 July 1886. In it Reynolds explained how he used a knotted piece of vibrating string (the knots were elements arranged in periods of seven) and told students to

imagine how the different amplitudes might represent a change of property along a period. This was just the sort of analogy that Crookes needed to add a bit of excitement to his forthcoming Presidential Address to Section B (Chemistry) that was to meet in Birmingham in September 1886. In it he turned Reynolds's zig-zag upside down (so that hydrogen was at the top and heavier elements at the bottom) and used the analogy of a swinging pendulum. In its turn, the zig-zag traced by the pendulum became a cooling curve, with new elements condensing and being manufactured as the temperature dropped or violently fluctuated during distant cosmological and geological epochs. It therefore also plotted an evolutionary curve. The beauty of the analogy was that it could be dressed up in mathematical language (courtesy of his constant "hidden helper", the mathematical physicist George Stokes,) and that it could also be transformed into a three-dimensional model that his assistant James Gardiner unveiled at the Chemical Society three years later. The rare earths that he was currently trying to separate and differentiate became mixtures that he called meta-elements, while atomic weights (like chlorine's) that diverged from a whole number were also ad hoc mixtures of  $\text{Cl} = 35$  and  $\text{Cl} = 36$ .

As to the identity of the evolving protyle, this elegantly fitted the "fourth state of matter", or "radiant matter" that he had identified as the cause of the radiometer effect that he had studied during the previous decade and the "cathode rays" that he was currently exploring in radiometers fitted with electrodes (the Crookes tube). As was usual with his "big" set-piece speeches and presentations, Crookes ended the 1886 address with a fine example of purple prose that suggested that with the 4th state of matter and Prout's evolutionary model of periodicity, he had touched the borderland between known and unknown where lay "ultimate realities, subtle, far-reaching, wonderful". This can be read as a forecast of the structured atom and the relation between matter and energy; but it also clearly referred back to Crookes's psychic investigations of the 1870s when he had hoped to find linkages between a material world and a more subtle spiritual world with which it might one day be possible to communicate. Quoting Edmund Spenser's *Fairie Queene* (1590), Crookes noted there had been unknown geographical regions of the world that remained unknown until discovered by intrepid explorers. "And later times things more unknowne shall show./ Why then should witless man so much misweene / That nothing is, but which he have seene?"



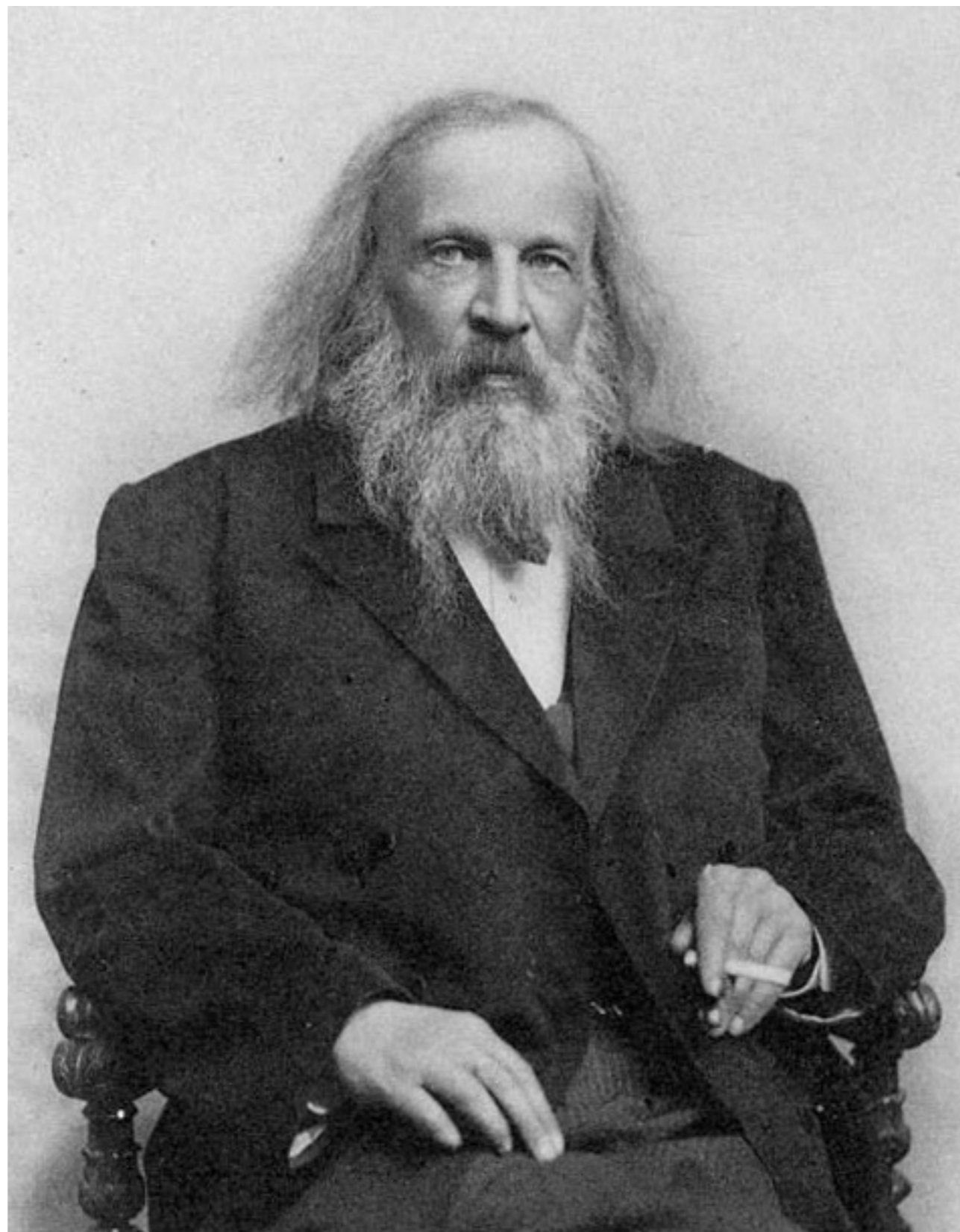
Kelley Wilder



Richard Noakes



REPORT: «Celebrating D.I. Mendeleev's Periodic System. A Historical Perspective / «Юбилей Периодической системы Д.И.Менделеева. Исторический аспект», was organized as a satellite meeting in the frame of the XXI Mendeleev Congress at the Saint Petersburg State University (Russia), on 10- 13 September 2019. This international symposium gathered scholars to tackle questions pertaining to the historical emergence, development and use of the Periodic System (PS), and its most powerful scientific icon, the Periodic Table (PT). While there are still much debates and ongoing discussion about the nature of the PS, the best arrangement of the elements, and the underlying laws that govern such a classification, this symposium specifically held a historical perspective. Beyond the story of discovery, and its context, it was the opportunity to also examine the response and the appropriation processes that explain the longevity of this classification across time, space and culture. In particular, this symposium aimed at providing space for less discussed topics such as the use of PT in textbooks and the pedagogical context, the presence of the PT in popular culture, and the role of women scientists in the development of the PS and the PT.



**Celebrating D.I. Mendeleev's Periodic System. A Historical Perspective** The symposium «Celebrating D.I. Mendeleev's Periodic System. A Historical Perspective / «Юбилей Периодической системы Д.И.Менделеева. Исторический аспект»

The symposium was bilingual, with translation to English provided when papers were given in Russian, which provided a unique opportunity to meet with the Russian community of historians of science. Prof. Martyn Poliakoff (University of Nottingham, England) opened the meeting with his talk Mendeleev's gift to Education. On the second day, Prof. Bernadette Bensaude-Vincent (Université Paris 1, Panthéon-Sorbonne, France) spoke about Mendeleev's notion of chemical element: a key actor in the construction of the periodic table, and Prof. Helge Kragh (Niels Bohr Institute, Denmark) gave a talk on Astrochemistry, New Elements, and Mendeleev's Periodic Table. The third day, which focused on the Russian context, was inaugurated with a paper on Mendeleev, Markovnikov and the *Zhurнал Russkago Khimicheskago Obshchestva: Celebrating Three Sesquicentennials* by Prof. David E. Lewis (University of Wisconsin-Eau Claire, USA). A short movie on Boblovo, the Mendeleev Estate museum, that has been undergoing renovation, was also shown. Besides the keynote lectures, 22 papers were delivered, several posters discussed during a coffee break and a roundtable organized. Historical papers touched upon the teaching of chemistry before Mendeleev (T. N. Zhukovskaya), the periodic law (Igor S. Dimitriev), Lothar Meyer (G. Boeck), the Russian contribution to the PS (E. A. Zaitseva-Baum and V.V. Lunin), the dissemination of the PS in Russia (T. V. Bogatova) and in Portugal (I. Malaquias)



and the contrasting uses of the PS by Lise Meitner and I. Noddack (B. Van Tiggelen and A. Lykknes). More philosophical approaches were provided with talks on the use of colours in periodic tables (B. Bock von Wulffingen), the chemical space and the construction of the periodic system (G. Restrepo), and Nechaev's method (S. V. Teleshov). Papers on the PS beyond chemistry (E. Babaev), the Metrological Institute memorial complex (E. B. Ginak) as well as the roundtable dedicated to the memorialisation, expanded the topic to cultural approaches and the staging of the PS in Museums and other buildings.

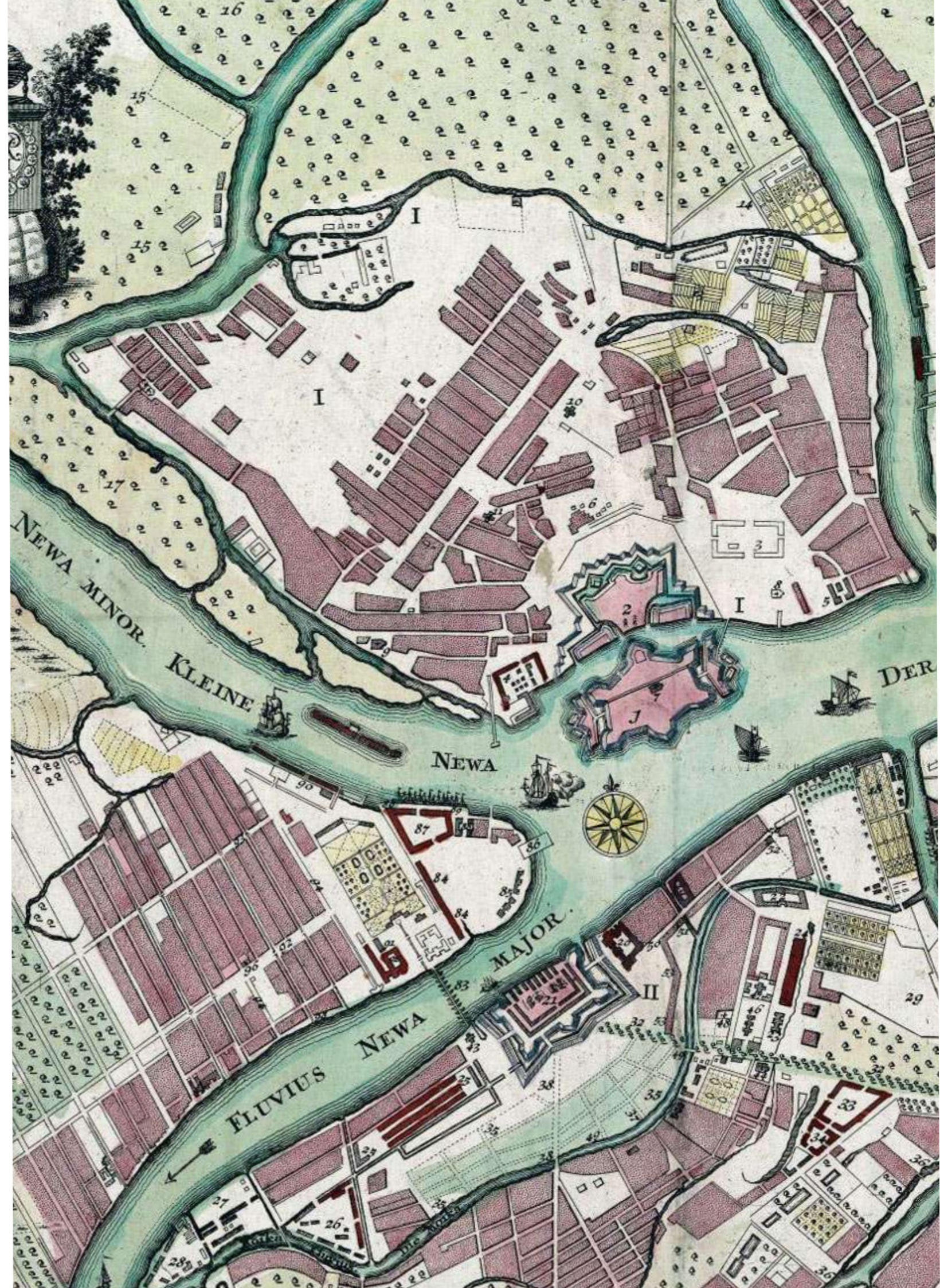
The cultural and social programme was the most dense and rich, and provided the participants with the opportunity to visit the main sites of Mendeleev's life and work (St Petersburg University and the Metrological Institute) as well as scientific and cultural heritage such as the Kunstkamera and the Lomonosov Museum. Among the high points was a visit to a little-known periodic wall chart devised by Mendeleev himself for his teaching in 1876, and still to be seen in the lecture hall where it was in 1894.

The fruitful exchange on the periodic system and the discovery of the amazing heritage related to D.I. Mendeleev and the history of chemistry still to be seen, prompted the participants to issue a recommendation at the end of this meeting. This recommendation pleaded for IUPAC and the chemical societies celebrating the IYPT across the world to foster attention to the heritage of D.I. Mendeleev, to encourage support for archives, museums and other historical

and scientific exhibitions concerning his work, and related fields, and to help implement international historical and chemical projects (educational, research and publishing projects) in order to further study the legacy of D.I. Mendeleev, and make it available to the wider community. The participants also recommend to apply to UNESCO for a recognition of Mendeleev's Museum and Archive as a World Heritage Site, with the support of the Mendeleev Russian Chemical Society and other national and international chemical and scientific organizations.

The full program is to be found at the symposium website: <https://hystsypodium.wordpress.com/>

The Organizing Committee consisted of prof. Valery V. Lunin (Moscow State University, Chemical Department, Russia), and Dr. Brigitte Van Tiggelen (Science History Foundation, USA/ Mémosciences asbl, Belgium), chairs; prof. Aslan Ju. Tsvadze (A. Frumkin Institute of Physical Chemistry and Electrochemistry Russian Academy of Science, Russia), chair of the Mendeleev Congress and Dr. Elena Baum Zaitseva (Moscow State University, Chemical Department, Russia), scientific secretary. The symposium was supported by the EuChemS – Working Party on the History of Chemistry, the Russian Academy of Sciences, the Ministry of Science and Higher Education of the Russian Federation, the Mendeleev Russian Chemical Society, the St. Petersburg state University and Russian chemists Union. This specific edition of the Mendeleev Congress was also supported by IUPAC, since 2019 was declared the International Year of the Periodic Table. The setting up of the symposium also involved several members of the EuChemS WPHC: Gisela Boeck, Isabel Malaquias and Elena Zaitseva. Brigitte Van Tiggelen, Science History Institute/ Mémosciences.





# “The Changing Role of Consultants in Industry, 1850-2000”

## A Workshop held at the Maison Française, Oxford, 10-11 May 2019



By Jpbowen - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=23022066>

REPORT. The workshop was organised by Peter Reed (an Independent Researcher from California), Jonathan Ayles (Honorary Senior Fellow, Manchester Institute of Innovation Research, University of Manchester) and Viviane Quirke (Senior Lecturer in Modern History and History of Medicine at Oxford Brookes University).

The workshop attracted 20 participants, of whom 15 gave papers during the two days of the workshop. The keynote lecture was given by Anna Guagnini (University of Bologna) who also acted as a commentator; two additional commentators were from the University of Oxford and from the Science Museum, London. The workshop had a strong international outlook with participants from Italy, Norway, the USA and Canada as well as the UK. The papers which were pre-circulated cover studies of key individuals or consultancy firms in key sectors such as chemicals, pharmaceuticals, engineering, construction, and the social sciences.

The workshop was an extremely worthwhile event: varied, informative, breaking new ground and thought provoking. It tapped a wide range of new research and stimulated debate. All in all, a great success in opening up a new field neglected by historians of science, engineering and technology. It is now planned to publish a selection of the papers, either as a book or as special issues of journals.

Financial support was provided by the Society for the History of Alchemy and Chemistry, the Newcomen Society, Oxford Brookes University and the British Society for the History of Science, for which the organisers are extremely grateful.



# 12 ICHC



**Report: 12th ICHC.** Between July 29 and August 2, tens of historians of chemistry met in Maastricht on the occasion of the 12th International Conference on the History of Chemistry (12ICHC). The meeting was organized by the EuChemS Working Party on the History of Chemistry and hosted by the Maastricht University, with Ernst Homburg (as chair of the Local Organizing Committee), as well as Christoph Meinel and Ignacio Suay-Matallana (as co-chairs of the Steering Committee), under the auspices of the Royal Netherlands Chemical Society (KNCV), the Maastricht University, and with the support of the Science History Institute, the Solvay company, the Polymer Research Platform (DPI), the Society of the History of Alchemy and Chemistry (SHAC), the Holland Chemistry, the ACSeBooks and the Linda Hall Library.

The conference was opened by Ernst Homburg, with a presentation on the Dutch contributions to the history of chemistry, followed by the invited speaker Lissa Roberts, who talked about the relations between history of chemistry and global history, who gave the second opening key lecture. Roberts pointed out the importance of decentred history of chemistry. She also highlighted the role of material biographies in order to put this challenge into context. It is worth recovering one of the questions that Roberts asked to the participants attending the conference: What is the History of Chemistry? During the 12ICHC, historians of chemistry around the world answered this question by sharing the results of several ongoing research projects.



Marco Beretta and Carsten Reinhardt gave the other two key lectures. On the one hand Beretta's lecture focused on the material realm of Lavoisier's chemistry. His presentation invited the audience to explore Lavoisier and contemporaries' labs. On the other hand, Reinhardt's lecture provided participants with an insider's look into the global chemical industry in the 20th century. But there was also time at the 12ICHC to go beyond the European and American context. In fact, the history of chemistry in Japan was the central issue of the lecture of the 2018 Morris Award winner Yasu Furukawa.

The 12ICHC program offered a wide range of research topics and historiographical perspectives on the history of chemistry, such as alchemy, early chemistry, chemical analyses, sites of chemical knowledge, material and visual culture of chemistry, women in STEM and chemistry industries, among many others. The program shows both the variety and thematic richness of the meeting and the quality of the lines of research in progress.

It should be noticed that the 12ICHC has coincided with two important anniversaries in the history of chemistry: the 150th anniversary of the periodic system and the 100th anniversary of the International Union of Pure and Applied Chemistry (IUPAC). Both anniversaries were part of the 12ICHC program with two especial panels:

the panel *150 years of the Periodic System* organized by Gisela Boeck, Annette Lykknes, Isabel Malaquias and Luis Moreno-Martínez and the panel *IUPAC and the other international scientific organizations: competition or synergy?* organized by Brigitte Van Tiggelen and Danielle Fauque. Both panels show how these conferences can contribute to facilitate communication between chemists, chemistry teachers and historians of chemistry. These are just some of the main topics widely addressed by the participants. In addition, *Substantia*, a new international journal on the history of chemistry, made its debut at the 12ICHC.

Also the Working Party of the History of Chemistry business meeting was held on the last day of the conference. Annette Lykknes was nominated chair-elected, and Ignacio Suay-Matallana was re-elected as secretary of the Working party. In addition, Isabel Malaquias was elected as vice-chair, and Yoanna Alexiou was appointed as communication officer.

The conference was closed after two roundtables. The first one was focused on an upcoming six-volume Cultural History of Chemistry: ancient, medieval, early modern, 18th, 19th and 20th chemistry. Alan Rocke (chair), Ernst Homburg, Peter Ramberg, Marco Beretta

and Marcus Carrier discussed on the importance of engaging history of chemistry with cultural topics, like art, genre or pedagogy. The second roundtable was chaired by Brigitte van Tiggelen with John Christie, Jeff Johnson, Annette Lykknes, Cyrus Mody and Peter Morris as discussants. The last session of the 12ICHC was devoted to the challenge of writing the 20th history of chemistry. Issues like the (negative) impact of chemistry on society or the increasing massive and technological nature of contemporary chemistry were some of the themes discussed during the last session of the 12ICHC.

Even though it is not possible here to sum up all the conclusion of the 4 key lectures and the 19 specialized panels of the 12ICHC, this conference was a fulfilling experience for all the participants. The social program, which included an amazing excursion to Liège, Kelmis and Stolberg (three sites that are all related to the history of zinc), and the cherished coffee breaks were also valuable opportunities to meet and make effective contacts, which was especially fruitful for young scholars. The great work of the local staff was also a high point that made the 12ICHC a reality. The 2019 conference is now part of our current history of the history of chemistry. For the 13ICHC we still have to wait until 2021 to meet again, this time in Vilnius.

Luis Moreno-Martínez, Juanelo Turriano Foundation Research Fellow at the López Piñero Interuniversity Institute  
Silvia Pérez-Criado, PhD candidate at the López Piñero Interuniversity Institute





After five years of sterling service as Associate Editor of Ambix Alan Rocke stood down at the end of 2019. As a token of the Society's gratitude SHAC Chair, Frank James, presented Rocke with an inscribed framed front cover of Ambix with Peter Morris looking on.



The presentation was then followed by the SHAC's Morris Award Lecture by Professor Yasu Furukawa for his outstanding work on the history of chemistry and its relationship with the chemical industry.



SHAC ran a Special Award Scheme in 2019 to support the attendance of early-career scholars and independent scholars at ICHC. Reports from some of those who received contributions towards the cost of attending can be read on the following pages.

## report from Birte Camen

I am particularly grateful to SHAC for providing me with a travel grant to attend the 12ICHC in Maastricht. I presented preliminary results of research on the manuscript “Artificia Alchimica” (1596) from the Austrian National Library. Due to a transcription error, the name and identity of the author of this manuscript remained unknown. His real name is Dr. Johannes Hennemann named Reising instead of Johann Herman or Heumann Reising. Hennemann wrote the manuscript of about 864 pages with 1362 recipes to make remedies when he was a court physician of Emperor Rudolf II in the 1590th.

The text written in Middle High German Kurrent Handwriting with Silesian dialect was transcribed with the help of the software „Transkribus“. It should be noted that the structure of the book with the main sections Salts, Sulfur, Mercury, Minerals, and Metals reminds us of a modern textbook. The influence of Paracelsus is obvious. So far, my academic supervisor Rudolf Werner Soukup and I only looked at some recipes in depth, e.g. the description for preparation of hydrochloric acid based on clay and salt appears to be far ahead of its time. It is also worth mentioning that 126 antimonide recipes are included in the section “Minerals”. By contrast, the “Basilica Chymica” (1609) of Oswald Croll only contains six antimonide recipes.

The session B1 “Alchemy and Early Chemistry” started with a paper about an Arabic alchemistic manuscript from 867. An extremely rare alchemical book published in 1604 in Florence was presented by Georgiana D. Hedesan from the University of Oxford. This book as well as the “Artificia Alchimica” are from the same time and contain recipes, which were influenced by Paracelsus. Therefore, the author of this paper and I are currently thinking about a joint project. The session was concluded with applied research about recipes of the German alchemist Kunckel and a philosophical controversy between Boyle and Spinoza about an experiment designed by Glauber.

Besides this session I also attended others. Particularly relevant for me was a session on women in chemistry, which showed that they might have played a much more important role in the development of chemistry than normally assumed. Here the case of Madame Lavoisier was one focus of debate. Beyond that, a session about the importance of chemistry history for school teaching was also highly interesting. Currently, far too many European textbooks ignore the history of chemistry, although a stronger emphasis on it might make chemistry more accessible to pupils and students.

I am deeply indebted to SHAC for the opportunity to share my research and to widen my scholarly connections. In case anyone reading this report is interested in the research described above, please send an e-mail to Birte.Camen@gmx.at.



# report from Christopher Halm

I would like to thank the Society for the History of Alchemy and Chemistry (SHAC) for presenting me the “ICHC Special Award Scheme” that enabled me to participate at the 12th International Conference on the History of Chemistry (ICHC) in Maastricht, Netherlands (29 July - 2 August 2019). My paper “Chemists in Agriculture. The Implementation of «Field-Laboratories»” was part of the panel “Making, Knowing, and Performing Outside the Laboratory: Different Sites of Chemical Knowledge Production”.

This panel was designed by me in cooperation with other participants. The idea behind the panel was to follow up on recent studies that have shown that the production and presentation of chemical knowledge encompass a wide range of different sites and practices. Beginning with the 18th century, the panel’s four papers investigated how chemical knowledge was produced outside the ideal laboratory. The sites studied were the arable field, the courtroom, the observatory, and the surface of Mars.

Thanks to the excellent commentary and a rich final discussion with the audience, at least three connections between the four individual contributions could be highlighted: (1) In the attempt to succeed even in rather unconventional spaces, chemists tend to set up laboratory-like structures or even new forms the laboratory into these spaces. (2) In so doing, they face issues of how to justify the efforts and the costs involved in such ventures. (3) During the subsequent implementation of the project, the chemists and their laboratories

consistently had to adapt to temporarily changing circumstances. In conclusion, the papers given in the panel construed the problem of how chemists may create stability in spaces that are offbeat, somehow less well-known, inherently (by nature) unstable and occasionally very changeable.

One of the surprising results of this panel was the strong mobility of the laboratory: Laboratories can be packed into a suitcase and brought as such onto the farmland. They can even drive independently as a rover on Mars. Moreover, laboratories seem to have an invasive character. They alter the way how people do research in a particular space, what equipment they use and what questions they ask. Laboratories change the perception of a certain space. Eventually, they change the space itself and create a new version of it.

I am very grateful to the SHAC for giving me the opportunity to present my research and to communicate my idea of the «field-laboratory» to an internationally highly respectable audience. Thanks to the excellent exchange, I was able to prove and strengthen my argumentation, which encourages me to publish my results in the very near future.

# report from Filip A.A. Buyse

THE ICHC12 conference has been quite interesting and useful.

On Sunday, I left for Maastricht and stayed the whole week in this historical city until Friday evening.

On Monday, after the registration, I attended the opening session and the welcome party. After the key lecture on Tuesday morning, I gave my talk as part of the session on “Alchemy and Early Chemistry”. I was pleased that there was much interest in this session which was the only session in the field of “chymistry”. During this workshop, I have not only enjoyed the excellent papers of my colleagues. This session allowed me also to meet old friends and learn to know colleagues which I didn’t know yet. Furthermore, it is always pleasant to meet scholars, that you know from literature, in person. That’s how I met the chair of our session, Lawrence Principe.

After my talk, some people contacted me, asking me for the written version of my paper, sent me emails with questions which lead to discussions, useful for the research of both of us. In November, I will give another presentation on a similar subject in the Ritman Library in Amsterdam as part of the 10th Annual SHAC Post-Graduate Workshop. Subsequently, this paper will be published in a special issue of AMBIX, directed by Megan Piorko.

On Tuesday afternoon, Wednesday and Thursday, I selected sessions related to my research activities and interests. I enjoyed also the last session informing us about the state of art of the History of Chemistry project.

Besides attending sessions, I did also excursions, the visit of the Bosch brewery and the Friday excursion included. During these excursions, the pauses and the conference dinner, I met people with whom I had interesting discussions. Interestingly, some of them informed me about the possibilities of future projects, e.g. fellowships at the Science History Institute.

In sum, ICHC 12 was a positive experience and my plan is to participate also in the next ICHC conference in Vilnius.



# report from Silvia Pérez Criado

The SHAC Special ICHC12 Award Scheme offered me the unique opportunity to present the first results of my ongoing thesis project at the 12th International Conference on the History of Chemistry 2019 in Maastricht, Netherlands (29 July – 2 August 2019). I presented the paper: “DDT and the making of the Spanish pesticide industry during the early years of the Francoist dictatorship (1944-1950)”, jointly with José Ramón Bertomeu Sánchez, in a themed session on transitions in twentieth-century chemical industries.

Our communication reviews the first uses of DDT in Spain during the 1940s. We discussed how fascist policies and pest alarms along with several agricultural engineering projects encouraged the emergence of the Spanish pesticide industry within the context of political repression and autarky. Our focus is on the first important regulation on pesticides: the National Register created in 1942. We started with a brief review of the use of pesticides in early 20th-century Spain and the challenges created by the arrival of the Colorado beetle in the late 1930s. Then, we offered a collective portrayal of the community of agricultural engineers and their role in the first years of the Francoist regime. We discussed how the politics of autarky displayed new opportunities for developing agronomic programs and chemical industry. We also analysed the consequences of these regulations in hiding the risks of pesticides for farmers and food consumers. Pesticides became sources of slow poisoning as well as tools for social control and reinforced the alliance between agricultural engineers and fascist politicians in autarkic, authoritarian and technological dreams. In this context, we review the role of DDT in these developments by discussing its early uses in agriculture and public health in Spain.

The other papers in the same session provided a wider context for my thesis work and I learned new theoretical concepts and which methodological approaches are best suited to deal with them.

This 12ICHC has meant for me a meeting that has included both attractive and controversial themes, where various lines of research have been presented, and whose interest and relevance have been highlighted by the different speakers and some of the participants during the debates. These activities have shown both the variety and thematic richness of the meeting and the quality of the lines of research in progress. This biannual meeting has also been very important for me in the sense that it has allowed me to establish scientific contacts and academic ties with professionals in my field from all over the world, from universities to research centres.

The overlapping of the sessions during the three and half days of the meeting (understanding it is the usual situation in congresses and symposia), however, generated some frustration among those attendants who had interests in simultaneous presentations. Fortunately, the pleasant coffee breaks helped to a large extent to solve this limitation through the interaction and further discussions of those attendants with the appropriated speakers.

# report from Georgiana ‘Jo’ Hedesan

I presented my paper on 30 July 2019, on the first day of the IaCHC conference. The talk was included in a panel entitled Alchemy and Early Chemistry, which was chaired by Professor Lawrence Principe. The panel included five papers covering a wide time span (between the early Middle Ages and the early modern period) and was well attended by conference participants.

My paper was focussed on a rare book called *La Fonderia dell’Ill.mo et Ecc.mo Signor Don Antonio de’ Medici Principe di Capistrano Nella quale si contiene tutta l’arte spagirica di Teofrasto Paracelso, & sue medicine. E altre segreti bellissimi* (The Laboratory of his Most Illustrious and Excellent Lord Don Antonio de’ Medici, Prince of Capistrano, in which is contained the entire spagirical art of Theophrastus Paracelsus, and his medicines. And other wonderful secrets), published in 1604 in Florence. The only surviving copy – perhaps the only copy ever printed - is found in the British Library, and has apparently never been the subject of scholarly research. Its existence has previously been signalled by Paracelsus scholar Karl Sudhoff in 1894 and by historian of Cosimo de’ Medici alchemy Alfredo Perifano in 1997.

*La fonderia* refers to the alchemical laboratory founded by Francesco I de’ Medici (1541-1587) at Casino di San Marco in 1574. The Casino has most famously been associated with the publication of Antonio Neri’s *L’arte vetraria* (1612). The apogee of laboratory practice at the Casino took place under the patronage of Don Antonio de’ Medici (1576-1621), Francesco’s illegitimate son. Many manuscripts related to the Casino are still available in the Florence Library, including a 3-volume compendium of recipes. This compendium, entitled *L’Apparato della fonderia*, is clearly related to the *La fonderia* publication.

My analysis of the contents of *La fonderia* shows that it is the product of an anonymous alchemist who worked in the Casino and wrote the book for Don Antonio. My presentation at ICHC Maastricht focussed on my attempts to entangle some of the mysteries of its composition and publication. I briefly presented the structure and contents of the book, which evinces the strong influence of Paracelsian spagyrics and alchemical mineral practice. Furthermore I discussed the possible relationship between this book and alchemy at the Casino di San Marco in general.

My work on *La fonderia* is related to a larger project I’m trying to pursue on the Casino di San Marco. As such the presentation’s conclusions were only tentative. I argued that *La fonderia* opens up new perspectives on both alchemical theory and practice at Don Antonio’s Casino di San Marco, and that contents of the volume suggest that the presence of Paracelsianism at the Casino may have been more ‘real’ than previous research has argued for it to be.

My presentation benefitted from comments and suggestions by two leading scholars of alchemy and chemistry: Professors Marco Beretta and Rudolf Werner Soukup. Beretta has previously written on the Casino di San Marco, while Soukup is a specialist of Austrian alchemy, a subject related to the Casino. Both were supportive of my work, encouraged me along the path and offered some highly appreciated suggestions for the future.



report from  
**Konstantin  
Kiprijanov**

The SHAC ICHC Special Award offered me the unique opportunity to present the results of my recently completed PhD dissertation at ICHC12 in Maastricht. My contribution to this conference built on an earlier paper that I presented at ICHC11 in Trondheim, and which was also sponsored by a SHAC award that I had received in that year. By attending this year's meeting, I was able to discuss my progress with world-leading scholars who I met two years ago, and whose feedback made a significant and valuable contribution to the successful completion of my thesis.

In my PhD thesis, I investigated how structural formulae became established as the default graphic notation of organic chemistry during the last third of the nineteenth century. Aiming to provide a detailed account of the iconographic evolution of the modern chemical notation, my ICHC12 paper combined perspectives from history of chemistry with history of print culture to examine the practical challenges of printing and circulating different forms of chemical diagrams in the nineteenth century. I argued that, as a result of being printed by means of letterpress, structural formulae acquired several practical and economic advantages over competing diagrams that were proposed in the 1860s. Building on historical case studies of different printing technologies, I demonstrated that typeset formulae were faster to print and easier to reproduce than diagrams rendered by means of wood and copperplate engravings. The paper concluded that these advantages made structural formulae the most convenient representation of chemical structure with regard to the highly competitive market for chemical literature. In so doing, I showed that the iconography and lasting success of structural formulae did not derive from theoretical reasons alone, but were to a very large degree based on economic and practical aspects of print communication.

I was very excited to see the most recent developments in the history of chemistry and related fields, and to follow up on the research projects that were presented at the ICHC11 meeting in Trondheim two years ago. Most notably, I was thrilled to see that many of the papers presented at this year's conference were closely related to my own research. Papers presented in Session B3 ('Communication and Education') argued that we cannot understand the formation and operation of scientific disciplines without understanding how they are produced, reproduced, and gradually transformed by systems of pedagogy. Furthermore, contributions to Sessions A5 ('Sites of Chemical Knowledge') and A8 ('From the Lower Rhine Area into the World') emphasised that the acquisition of new skills and practices can only be understood in the local institutional context, for instance in the context of teaching and learning in the laboratory, but also in the field. I would like to express my gratitude to SHAC for its generous support of this project in the form of this grant and its continuous assistance through a vast network of international scholars in the discipline.

Tens of historians of chemistry joined the 12th International Conference on the History of Chemistry (12ICHC) in Maastricht between July 29 and August 2. On the occasion of the International Year of the Periodic Table (IYPT2019), the panel 150 years of the Periodic System organized by Gisela Boeck, Annette Lykknes, Isabel Malaquias and Luis Moreno-Martínez included 5 papers about the history of the periodic systems and its uses in teaching and popular culture. After Alan Rocke's paper on the work of the German Chemist Lothar Meyer, Pilar Gil recounted the story of the oldest periodic table wallchart, which was discovered in 2015 at St Andrews School of Chemistry. Isabel Malaquias and Joao Oliveira mapped the acceptance and use of Mendeleev's periodic classification in the Portuguese teaching context from the end of 1870s until 1970s. Then, Maria Teresa Gomes focused on blurring the boundaries between chemistry and literature through the history of the periodic table. Finally, Eugene Babaev showed how the periodic table appears in art and everyday life.

Even though IYPT2019 logo only includes the image of the Russian Chemist Dmitry I. Mendeleev, this panel of the 12ICHC provided a wide range of perspectives that clearly highlight the impossibility of conceiving the history of the periodic system as the history of a single man. The panel stressed that the history of the periodic systems goes beyond one man, one date or one place. The active role of science teachers and textbook writers was also pointed out as a key aspect of this iconic chapter of the history of chemistry, but also of the history of literature, the history of art and the popular culture.

report from  
**Luis  
Moreno-  
Martínez**

These were just a few of the topics discussed at the 12ICHC by historians of chemistry from different countries. The SHAC 2019 grant enabled me to attend other interesting panels such as the panel *IUPAC and the other international scientific organizations: competition or synergy?* organized by Brigitte Van Tiggelen and Danielle Fauque, on the occasion of the International Union of Pure and Applied Chemistry 100th anniversary (IUPAC100). Both panels -IYPT2019 and IUPAC100- show how historians of science can contribute to thinking critically the present day science.

The 12ICHC provided plenty of possibilities in order to show how history of chemistry can foster a fruitful analysis of current science issues such as chemistry education, chemical industries and sanitary fumigation, among many others. In the opening session of the 12ICHC, Lissa Roberts asked one question as a part of her key lecture: "What is the History of Chemistry?". During the 12ICHC, historians of chemistry around the world answered this question by sharing the results of several ongoing research projects. Now the point is what the History of Chemistry will be in the years to come. It will be necessary to wait at least until the 13ICHC to answer. But in the meantime, the 12ICHC is already part of our recent *history of chemistry history*.



# report from Paul Sampson

I applied to the SHAC New Scholar award with clear goals – to present at the History of Science Society conference in Utrecht, conduct a summer of research at the Huntington Library in San Marino, California, and then return to the U.K. as a visiting student at the Cambridge History and Philosophy of Science Department.

Spurred into action by the grant of a SHAC New Scholar award and the relentless California sun, I managed to transform the fruits of my archival research into the first draft chapter of my dissertation. Entitled “Disciplining the Environment: Airborne Contagion and Prison Reform in Britain, 1750-1800,” this chapter examines how the perception of crowded English prisons as dangerous centers of moral and physical contagion shaped the proposals of evangelical prison reformers like Jonas Hanway and John Howard. I traced the work and influence of the work of Richard Mead and Stephen Hales to argue that the ideal evangelical prison was a maximally-ventilated internal quarantine station in which the diseased elements of society could be isolated from the rest of the social body and restored to moral and physical health.

After presenting a version of this chapter at the sweltering but successful HSS 2019 conference in Utrecht, I began my preparations to return to England for the next stage of my research and writing. The last two months in Cambridge have been a whirlwind of activity as I have striven to take full advantage of this scholarly opportunity by sharing ideas with the welcoming and brilliant community in the History and Philosophy of Science department. Since arrival, I have written my second chapter, “The Lungs of a Ship: Labor, Medicine and the Maritime Environment,” which I had the fortune to present at the department’s Cabinet of Natural History Seminar series. This chapter further explores the theme of labor as the appalling mortality suffered by long-distance seafarers prompted the navy to stage a contest between two schemes to ventilate ships: Stephen Hales’ hand-operated “lungs of a ship” and Samuel Sutton’s fire-powered “ventilating pipes.” However, despite being ordered for all navy ships after 1756, the rationale for ventilators was tested when physicians began to argue that tropical environments - including over-crowded spaces on board ship - were impossible to ventilate and therefore unfit for human habitation.

I have since begun work on my third and fifth chapters, which have required me to delve deeply into seventeenth and eighteenth century chemical work on the composition of the air, especially the work of Robert Boyle, Nicholas Malpighi, John Arbuthnot and Herman Boerhaave. I remain deeply grateful to SHAC for helping to make this work possible and I eagerly await the next meeting!

Through the Society for the History of Alchemy and Chemistry’s ICHC special award scheme, it was possible to finance my attendance to the 12th International Conference on the History of Chemistry, held in Maastricht, in the Netherlands. I was able to present a paper titled “A look into historical collections of chemicals: glass containers’ deterioration and the development of preservation guidelines”. This paper was included in the Instruments, Collections and Materials session.

The work presented at ICHC showed the main results of my master’s dissertation project in the Conservation and Restoration field, which is currently in progress. This project takes the National Museum of Natural History and Science of the University of Lisbon’s (also known as MUHNAC) collection of historical chemicals into study, with two main goals – first, to assess the observed chemicals’ glass containers’ corrosion patterns, through macro and micro visualization and chemical analysis of the glasses. The objective is the determination of the factors contributing to the observed damages – such as the glass composition, the chemicals’ composition and the environment of the collection.

This award also allowed the attendance to the following activities - the keynote lectures and the Morris Award Lecture, as well as the sessions on Alchemy and Early Chemistry, IUPAC and the other international scientific organizations, Instruments, Collections and Materials, Sites of Chemical Knowledge, and, Material Research and its Toolkits. The sessions were highly informative, and I was able to learn more about areas of interest and research within the History of Science and of Chemistry, which were not

# report from Ana Rita Lourenço

fundamentally part of my academic upbringing, but are, however, of a great personal interest to me.

Other activities taken as part of the conference were the local excursion to the Brouwerij Bosch Brewery, a fully equipped brewery over two centuries old, as well as the arranged visit to the Stichting Restauratie Atelier Limburg (also known as SRAL) Conservation and Restoration institute, which specializes in the care of paintings, sculptures, modern and contemporary artworks, and historical interiors.

It was also a great opportunity, especially as an early scholar and this being my first conference abroad, to be in contact with many experienced, engaging and inspiring academics, for which I am thankful for all the positive conversations, ideas and encouragement received.



# New Scholars Award report by Francesca Antonelli

Thanks to the New Scholar Awards, my visit to the Kroch Library (Cornell University) has been most rewarding. During the visit I had the opportunity to explore the Lavoisier Collection in depth and I have found several interesting documents, hitherto unknown, related to Marie-Anne Paulze-Lavoisier (1758-1836). Among them, I have focused my attention on the plans of her residence in rue d'Anjou Saint-Honoré (Paris), which show her constant interest in organising rooms devoted to chemistry and physics within the main floor of the hôtel. This setting was changed several times and probably followed Madame Lavoisier's ideas on domestic sociability. Among the manuscript documents, I have surveyed in detail the laboratory notebooks (Registres de laboratoire) on the analysis and synthesis of water (early 1785) and I was able to identify Madame Lavoisier's handwriting and, thus, her contribution to these crucial public experiments. Although these manuscripts have been known since the early 1950s, historians of science have totally neglected her role.

I have gained important information also by examining Madame Lavoisier's books containing letters and dedications which hint to the evolution of her network after Lavoisier's death in 1794. These titles are also listed in the manuscript catalogue of her library, which is also part of the Kroch collection. By studying her personal belongings I have found a new drawing in a travel case, various games used in the salon, and books bound by her, such as Lavoisier's *Traité élémentaire de chimie* (published in 1789 and bound sometimes at the beginning of the 19th century in green guillemot morocco).

I have carefully examined all the preparatory drawings and proof engravings prepared by Madame Lavoisier to illustrate the

*Traité*. In my analysis, I was able to discern the division of labor between her and her husband. I have also studied the engraved copper plate by Madame Lavoisier to illustrate planche VIII of the *Traité* (the one illustrating the gasometer). In addition to this extremely important documentation the Kroch Library hosts a large amount of letters, some of which document her life during and after the French Revolution.

At last but not least, I have consulted Madame Lavoisier's remarkable collection of musical partitions, shedding new light on both her relations with important musicians and composers and her active interest in music.

Altogether, this rich collection of documents and artefacts shows that Madame Lavoisier's cultural interest and activities went far beyond her husband's death and continued up to the end of her life (1836).

# New Scholars Award report by Silvia Pérez Criado

The New Scholars Award offered me the unique opportunity to access the archives of the Ministry of Agriculture at the General Archive of the Administration (AGA). The archives contain many reports written by agricultural engineers on to control of pest in the 1940s and 1950s as well as the Registro de Productos Fitosanitarios (File records of authorized pesticides) created in 1943. The grant has been employed for covering travel expenses and lodging in Alcalá de Henares (Madrid) for a two weeks in November 2019. The files and reports found are very useful for my ongoing doctoral research. Additionally, this award allowed me to visit the Complutense University Medicine Library, which have a lot of journals of history of medicine and occupational health. And I found very interesting articles about the use of DDT to combat typhus and malaria in Spain. The most relevant Spanish journals found to me are *Revista de Sanidad e Higiene Pública* (Public Health and Hygiene), *Revista de Medicina Colonial* (Colonial Medicine) and *Revista de Medicina y Seguridad en el Trabajo* (Medicine and occupational health).

Without the generous help of SHAC, it would not have been possible to find these primary source, which are an unique material for my thesis, so many thanks for the support.



# report from Corinna Gannon

Thanks to the generous financial support of SHAC, I was able to travel to Basle and Vienna to do research in situ. In Basle (Aug. 13th), I visited the Museum of Pharmacy where I studied various amulets and talismans. Of particular interest for my research is a talisman ascribed to the Swiss alchemist Leonhard Thurneysser which is said to be made from electrum, an alloy of seven metals. The so-called “Alchemical Hand Bell of Rudolf II” which I have studied extensively is said to be made of the same alloy. Therefore, the Thurneysser talismans are important objects of reference. I will publish these findings in a forthcoming essay in the *Studia Rudolphina*. I also published a minor blog essay (<https://www.aurorapharma.com/blog/kunst-talismane>) in September.

In Vienna (Oct. 27th-Nov. 1st), I continued to pursue the traces of electrum objects. I could find the same talismans in the collection Münzkabinett of the Kunsthistorisches Museum and the Institut für Numismatik und Geldgeschichte, Sammlung Brettauer. Also, I spent two days in the Austrian National Library to study illustrated (alchemical) manuscripts (Cod. Min. 31, Cod. 11414, Cod. 9423, Cod. 3317, Cod. 11290). Especially Cod. 11414, a richly illustrated and unpublished codex dedicated to Rudolf II., will be included in the second chapter of my dissertation on alchemical mirrors. I am going to travel to Leipzig in November (Nov. 26th) to study a copy of this

manuscript in the University Library (Ms 0401). In the Albertina, I studied miniatures by the Flemish artist Joris Hoefnagel to whom the watercolor drawing of the Rudolfine Horoscope (Cod. Min. 31) is ascribed in order to better understand the particularities of this artist’s hand. Currently, I doubt that Hoefnagel is the maker of the horoscope.

At the symposium, “Alchemical Laboratories. Practices, texts, material relics” in February 2020, I will present my findings on objects made from Electrum. I intend to speak about the alchemical hand bell and Thurneysser talismans. Even though no electrum mirrors are known to have survived, there are various alchemical and magical sources mentioning the existence and even production of such mirrors. The newly discovered illustrations in Cod. 11414 will therefore add a third group of objects to the list.

# New Scholars Award report from Mike A. Zuber

Thanks to a New Scholars Award 2018/19, I was able to travel to Bamberg to consult archival records on the seventeenth-century soldier and alchemist Christian Wilhelm von Krohneman (d. 1686). The State Archives Bamberg preserve six voluminous files documenting his lengthy imprisonment at the Plassenburg Castle near Kulmbach under Margrave Christian Ernst of Brandenburg-Bayreuth and his wife, Sophia Louise. After a desperate attempt to escape from this predicament, Krohneman found his ignominious end at the gallows on 27 April/7 May 1686. This episode has largely overshadowed any of Krohneman’s activities as an alchemical practitioner and turned him into a prototypical example of the proverbial fraudulent alchemist. My research on his fate aims to arrive at a more nuanced picture that does not view his death by hanging as a foregone conclusion.

Due to the mass of material that occasionally does not even contain basic numbering or pagination, research on site at the State Archives Bamberg was unavoidable. It turned out that my initial visit in June 2019 was fortuitously timed: I learnt that from the beginning of July, researchers would be allowed to take photographs of archival holdings.

During three days in June, I was thus able to take stock of most of the files and gain a basic understanding of the events that took place during Krohneman’s long imprisonment. One month later, I returned to make the most of a further two days in Bamberg, during which I took plenty of pictures that I shall continue to study in Australia over the coming months.

The most significant discovery so far is a substantial apology and alchemical treatise that Krohneman dictated over the course of a year (February 1683 to January 1684), with long interruptions during which his exceedingly poor state of health—afflicted by various symptoms associated with mercury poisoning—did not allow him to carry on. As the biographical backgrounds of nearly all works of alchemical literature remain shrouded in mystery, this is an exceptional find that will allow me to explore how this treatise authored by Krohneman was shaped by the context of its creation and immediate reception. It appears that, due to this treatise, the prisoner succeeded in again convincing his irate patron of his alchemical knowledge: in February 1684, the conditions of Krohneman’s imprisonment were significantly improved and a laboratory was built according to his needs over the following months.

As Krohneman found it impossible to deliver on his promises and his patron’s patience slowly but surely ran out, he resorted to ever more desperate means to cling to life. Even as he lied and incited his servants to theft and burglary, Krohneman was also caught in a web of his own promises and the expectations stimulated by prevalent theories of metallic transmutation, suffering severe health issues as a consequence of his alchemical practice: it is time for a more sympathetic treatment that shows the complexities of his fate.



# report from Evan Hepler-Smith

Evan Hepler-Smith received a SHAC subject development award in 2018. This enabled him to support a joint interdisciplinary workshop with the Boston College Institute for the Liberal Arts entitled *Remapping Chemicals, Environments, and Toxicity*. Here, he outlines the background to the workshop and sketches the discussion that took place.

Toxic pollutants are responsible for nearly 10 million premature deaths a year, per a 2017 report of the Lancet Commission on Pollution and Health. The burdens of pollution are also disproportionately borne by the global poor. This comprises not only a major global health issue but a significant human rights concern, as detailed in a 2018 report to the UN Human Rights Council. Furthermore, whether associated with infrastructure (lead pipes and paint dust, cities choked with diesel exhaust, coal-burning power plants) or synthetic chemical emissions and waste (from PCBs to the perfluoroalkyl substances or “PFASs”), a signal feature of chemical pollution is its tendency to accumulate and persist. In the words of one group of environmental toxicologists, environmental toxicity poses an “intractable, potentially never-ending chemicals management issue that challenges the conventional chemical assessment and management paradigm adopted by society since the 1970s.”

At present, scholars and professionals in a wide range of fields are engaged in reconceiving both the causes of chemical pollution and toxicity and potential ways of solving it. Across the disciplines, scholars have grown frustrated with existing approaches to toxic chemicals cleanup and regulation. Molecule-by-molecule, site-by-site, or

sector-by-sector efforts always seem to get bogged down in uncertainty. When action does come, it too often seems to involve simply trading one toxic hazard for another—or increasing global environmental inequality by shifting toxicity toward disadvantaged and neglected communities. For more than a century, scientists, advocates, industries, and regulators have swung back and forth between efforts to mitigate toxic hazard—often provisionally successful, almost always ultimately dissatisfying—at the level of individual chemical substances, individual sources and sinks of emissions, and individual applications of chemical products. Might there be other, potentially more productive ways of conceiving of chemicals, environments, and toxicity? Might we canvas the long-term history of alchemy and chemistry for paths not taken that are worth further exploration?

With the support of the Society for the History of Alchemy and Chemistry and the Boston College Institute for the Liberal Arts, an interdisciplinary group of scholars gathered in Boston in June 2019 for a workshop entitled *Remapping Chemicals, Environments, and Toxicity*. Disciplines represented included history, anthropology, sociology, chemical engineering, geography, library and information science, and industrial ecology. We compared notes on how our communities have sought more promising approaches to the persistent problem of environmental toxicity by rethinking what persistent chemicals are, in the first place. For example, industrial ecologist Jonathan Kronos accounts for aggregate flows of materials, and conceives of the hazards that they may pose, within the context of broader cycles of “industrial metabolism.” Similar remappings engage categories from petrochemical refineries to fine particulates to personal care products.

The participants in this meeting—historians Angela Creager, Evan Hepler-Smith, David Jones, Colleen Lanier-Christensen, and Michelle Murphy; anthropologists Ruth Goldstein, Nicholas Shapiro, and Elena Sobrino; engineer Jonathan Kronos; geographer Julie Guthman; librarian and information professional Leah McEwen; and sociologist Lauren Richter—would like to thank the Society for the History of Alchemy and Chemistry for helping to support this productive and provocative gathering.



# report from Marieke M.A. Hendriksen

On Saturday 31 August 2019, a total of eighteen participants in two 1.5 hr sessions participated in the workshop “Embodied knowledge between home decoration and science: wax fruits” during the conference Uncovering Material Knowledge conference at Queen’s University, Belfast.

Embodied knowledge between home decoration and science: wax fruits

Wax was a popular and widely used material in various pictorial and epistemic traditions in the early modern period. Wax models of fruits have a long and complicated history, being produced both as home decorations and as scientific objects. The embodied knowledge required to create these objects must thus have traversed social, geographical, and occupational domains. In this hands-on workshop, we try to create different kinds of wax fruits using instructions from a seventeenth-century Dutch household recipe book and use our embodied experience to reflect on that of the original makers, as well as on issues such as the gendered nature of early modern wax modelling. This workshop is funded by the Society for the History of Alchemy and Chemistry.

Marieke Hendriksen is a historian of early modern science and art. She has published widely on material culture, sensory perception, and embodiment in knowledge production. She is a postdoctoral researcher on Artechne: Technique in the Arts, 1500-1950, and a PI on Art DATIS, a DH project on the history of glass as an artistic material at Utrecht University, the Netherlands. [www.mariekehendriksen.nl](http://www.mariekehendriksen.nl).

Workshop participants came from a variety of academic and professional backgrounds (e.g. history of science, art history, literature, design). After a short introductory presentation on the history of wax as a modelling material, participants were divided in groups of three and given transla-

tions of three early modern Dutch recipes for creating fruits from bees wax (apples and prunes from yellow wax, gooseberries from white wax, cherries from red wax).

Participants circulated between workstations every 20 minutes. After an hour, we reconvened to discuss how handling the materials had changed our understanding of the historical recipe texts. (Photo impression below)

We will now use the documentation of the workshop to develop an article and a new research project proposal on material knowledge. We would like to thank SHAC for their generous support of this workshop.





# POSTGRADUATE WORKSHOP: “Society and the Creation of (al) Chemical Knowledge”

The tenth annual SHAC Post-Graduate Workshop on the theme of “Society and the Creation of (al)Chemical Knowledge” was hosted by the Embassy of the Free Mind on 29-30 November 2019. Marieke Hendriksen and Simon Werrett gave keynote presentations, Peter Forshaw gave a tour of some of the treasures of the Bibliotheca Philosophica Hermetica, and Megan Piorko gave a public lecture the evening before the workshop. Six post-graduates presented their research during the workshop: Magdalena Luszczynska, Filip A. A. Buyse, Umberto Veronesi, Sarah Lang, Lyke de Vries, and Fabiana Lopes da Silveira. Energetic discussions ensued over coffee about the relationship between the history of chemistry and society both historically and today in the Society for the History of Alchemy and Chemistry. New members joined and conversation continues to flourish over email.



MEGAN PIORKO



SIMON WERRETT  
(photo by Megan Piorko)



# Humphry Davy Notebooks Online

I'm delighted to announce that the website for the AHRC-funded project to crowdsource five of Humphry Davy's notebooks is now online at <http://humphrydavy.org.uk/notebooks/>.

Sir Humphry Davy (1778-1829) was one of the most significant and famous figures in the scientific and literary culture of early nineteenth-century Britain, Europe, and America. Davy's scientific accomplishments include: conducting pioneering research into the physiological effects of nitrous oxide (often called 'laughing gas'); isolating seven chemical elements (magnesium, calcium, potassium, sodium, strontium, barium, and boron) and establishing the elemental status of chlorine and iodine; inventing a miners' safety lamp; developing the electrochemical protection of the copper sheeting of Royal Navy vessels; conserving the Herculaneum papyri; and writing an influential text on agricultural chemistry. Davy was also a poet, moving in the same literary circles as Lord Byron, Samuel Taylor Coleridge, Robert Southey, and William Wordsworth.

More than 500 people from around the world participated in the notebook transcriptions (using the Zooniverse platform: [www.zooniverse.org](http://www.zooniverse.org)). The notebooks transcribed date from 1795-1805 and contain a mixture of Davy's thoughts, scientific experiments, poetry, geological observations, travel accounts, and personal philosophy. The website is fully searchable and the final transcriptions of all 5 notebooks can be read online.

-Sharon Ruston

# Changes at the Science History Institute

Robert Anderson has indicated his intention to stand down, in mid-2020, from the post of President of the Science History Institute in Philadelphia (formerly, until February last year, known as the Chemical Heritage Foundation). By then he will have held the post for four years, having taken over from Carsten Reinhardt in July 2016. A search firm has been appointed to help the Institute's Board identify his successor. This has been Robert's third job as CEO, his previous appointments being at the National Museums of Scotland in Edinburgh, and at the British Museum. He was chairman of SHAC from 2007 to 2017.



**Corinna Guerra** was awarded by the 2017 Prize for Young Historians from the International Academy of the History of Science (at the Academy Council unanimously) for the book *Lavoisier e Parthenope. Contributo ad una storia della chimica del Regno di Napoli* (Naples, Società Napoletana di Storia Patria & Istituto di Studi Storici, 2017).

Every two years since 1968, this Prize of the IAHS (founded in 1927 under the initiative of Aldo Mieli) honours a first work in the History of Science. The ceremony took place in Athens on the 15th September 2019 during the 1st Conference of the International Academy of the History of Science “Science in Different Cultures and Civilizations. Towards a transcultural history of knowledge”.

The publication was announced on *Chemical Intelligence* no. 19 February 2018, pp. 26-27.

For further details, see:  
<http://www.aihs-iahs.org/>  
<http://ciahs.hpdst.gr/programme/>





# MEMBERSHIP

The Society for the History of Alchemy and Chemistry has a longstanding tradition in the field, organising colloquia, publications and promoting the interdisciplinary study of the history of alchemy and chemistry from its early beginnings to the present. The Society offers support to its members, including an award scheme, regular meetings and events, graduate network, and the triennial Partington prize for original academic writing on any aspect of the history of alchemy and chemistry. It offers a forum for advertising forthcoming events, both within the United Kingdom and internationally, and its website provides a portal to resources relating to the history of alchemy and chemistry. Members receive the Society's journal *Ambix*, the leading scholarly journal in the field of history of alchemy and chemistry. *Ambix* is published by Taylor & Francis and appears quarterly. Members also receive the Society's newsletter, *Chemical Intelligence*, twice yearly, and any new editions from the Sources of Alchemy and Chemistry volume.

Application forms and membership information may be found on the Society's website, <http://www.ambix.org/>, under 'Membership'. For all membership questions, please contact the Membership Secretary, Dr. Carolyn Cobbold: [cacobbold@gmail.com](mailto:cacobbold@gmail.com).

# CONTRIBUTE TO *CHEMICAL INTELLIGENCE*

We welcome any contributions that newsletter readers might wish to make to *Chemical Intelligence*. This includes, but is not limited to:

## Upcoming Conferences or Meetings

- Publications
- Conference or Meeting Reports (these should not normally exceed 1,000 words)
- News Items or Announcements
- Grants, Fellowships or Awards
- Reviews of Websites, projects or blogs of interest (up to 500 words)
- The Editor retains the right to select those contributions that are most relevant to the interests of the
- Society's members.

We also wish *Chemical Intelligence* to provide a platform for interaction between members. We therefore encourage you to submit:

- Questions you may wish to put to other members
- Materials that you are working on and wish to share
- Suggestions for improvement

For any queries regarding the content of *Chemical Intelligence*, or to propose material for inclusion in future issues, please contact the editor, Dr. Karoliina Pulkkinen: [kjpu@kth.se](mailto:kjpu@kth.se)