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<http://www.chem.qmul.ac.uk/rschg/>

<http://www.rsc.org/membership/networking/interestgroups/historical/index.asp>

## RSC Historical Group Newsletter

January 2011

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## From the Editor

I am delighted to introduce my first issue of the RSC Historical Group Newsletter. As many of you will know 2011 is the UNESCO International Year of Chemistry (IYC 2011) and this issue reflects some of the themes behind this celebration. The aims of this United Nations-designated initiative are fourfold:

1. To increase public appreciation of chemistry in meeting world needs
2. To encourage interest in chemistry among young people
3. To generate enthusiasm for the creative future of chemistry
4. To celebrate the role of women in chemistry

In this issue you will find details of the many conferences inspired by IYC 2011 including the meeting organised by the Historical Group and the RSC Radiochemistry Group on Marie Curie and the History of Radiochemistry. There are also three essays: the first by Richard Toon on the history of patents in the UK; the second by Alan Dronsfield and Margaret Hill on Ida Freund, the first woman university chemistry lecturer in the UK; and the third by David Leaback on his work stimulating interest in local science amongst children in Southwark. There are reports of two RSC National Historical Chemical Landmark Awards: the first for Pfizer to commemorate more than half a century of discoveries at its European Research Headquarters in Sandwich, Kent; and the second at the Inorganic Chemistry Laboratory of the University of Oxford to commemorate the site where John Goodenough and his team developed the cathode material that rendered feasible the construction of the first lithium-ion rechargeable battery. A report on the conference "Celebrating the History of Chemical Information" organised by the RSC Chemical Information and Computer Applications Group and the CSA Trust, in association with the Historical Group also appears.

2011 also sees the introduction of changes to the RSC's system of charging for group membership so that members can join at no extra cost three interest groups. At the time of writing we know that this has already substantially increased our membership and I would like to take this opportunity to welcome all new members and to invite them to contribute items such as news, articles and book reviews to the newsletter. An official welcome from the RSCHG's Secretary and Committee appears on the next page. I would also like to thank everyone who has sent material for this newsletter, with particular thanks to the newsletter production team of Bill Griffith and Gerry Moss, the Group's Chairman, Alan Dronsfield, and the newsletter's former Editor, Viviane Quirke, for the additional help they have given me in editing my first issue.

The deadline for the next issue will be 19 June 2011. Please send your contributions to (a.simmons@ucl.ac.uk) as an attachment in Word or rich text format, or on CD-Rom (post to Epsom Lodge, La Grande Route de St Jean, St John, Jersey, JE3 4FL).

Anna Simmons  
University College London

## Correction

The item on p. 8 of our August 2010 Newsletter (A Lucky Escape; news of an accident at the Liebig Museum) was attributed to Bill Griffith; it should of course have been to Bill Brock.

## Welcome to new RSC Historical Group Members

Since our AGM in March 2010 (*Newsletter*, August 2010 pp. 3-6) our membership has increased from 319 to 460 (as of 12 January 2011). Our normal annual increase of RSC members is 5 to 10. This much larger increase is undoubtedly due to the new RSC policy of allowing members to join three interest groups a year without charge, as foreshadowed in the AGM.

Under normal circumstances the Secretary would write a letter of welcome to each new member but this is impracticable with this large increase. I, our Chairman, Treasurer and Newsletter Editor join with our Committee in welcoming all these new members. We normally have two meetings a year (those for 2010 and 2011 are referred to elsewhere in this issue) and we issue two *Newsletters* a year, normally in February and August.

It is worth noting that, as our membership roll increases, our *capitation* grant from the RSC goes down substantially. Society officials have told us that steps will be taken to ensure that members, old and new, should not suffer from this *per capita* drop in income, and our programme of low-cost conferences and twice-yearly Newsletters should continue. Your committee will continue to monitor this situation.

We would like to reiterate that we value our new members and thank you for your interest in, and we hope continued support of, the Historical Group.

Bill Griffith

## RSC NEWS

### Chemistry Connections – A New RSC Project

2011 will see the launch of *Chemistry Connections*, an exciting new project at the RSC to establish a global genealogical database for chemistry. Using

hierarchical links from an individual researcher to their PhD supervisor, chemists will be able to trace their chemical heritage through history to the forefathers of modern chemistry. *Chemistry Connections* will map how great scientists have transferred their findings and knowledge to their successors perpetuating the chemical sciences. With the International Year of Chemistry taking place in 2011, this project is an ideal opportunity to preserve and promote the story of chemistry.

*Chemistry Connections* will be constructed from a series of records each representing an individual researcher. The database will be hosted by MyRSC, the RSC's online professional networking tool. Whilst *Chemistry Connections* will be accessible to anyone interested in the history of chemistry, only those who are members of MyRSC will be able to create and edit records. Connecting the database to MyRSC will also enable the collected records to serve an additional purpose as a focused networking tool. In the longer term, we envisage that *Chemistry Connections* will provide a useful resource for aspiring scientists, encouraging career development and further education.

To ensure *Chemistry Connections* is a success from the start we wish to establish a core of key chemists to include on the database. We are eager to involve the Historical Group at this early stage in the project and will be liaising with your Chairman, Professor Dronsfield, to identify how this can best be achieved. Whilst identifying important chemists such as those who have been awarded Nobel prizes can be relatively simple, we are also keen to ensure our project has as wide a range of chemists represented as possible.

For each *Chemistry Connections* record, we propose to include the following information:

- Full name
- Year of birth and death (if applicable)
- PhD supervisor (plus year of qualification)
- Institution
- PhD students (if applicable)
- Short biographical information (if available)

At this early stage, if you would like further details of the project, or have suggestions of chemists we should include, please contact Sophie Boldon (boldons@rsc.org).

To register for a free account with MyRSC, visit: <http://my.rsc.org>

Sophie Boldon  
Project Manager

## Free On-line Access to the RSC's Journal Archives (pre-1939)

New members of the Historical Group will be interested to know that they can obtain free on-line access to the RSC's Journal Archives before 1939. This information appeared in our last newsletter, but is being repeated for all our new members and for anyone who missed it last August. The login name and login password may be obtained by emailing John Hudson, our Membership Secretary (johnhudson25@hotmail.com).

From RSC Publishing (originally sent May 2008)

*'As you are no doubt aware, the Historical Group Committee has for some time been in negotiation with RSC Publishing to see how its RSC members might gain access to parts of the RSC journals archive, without the need for you to pay document delivery fees. I am pleased to confirm that agreement has been reached, which allows RSC members free access to full text articles in the archive published between 1841 and 1939. Instructions on how to access an article are detailed below. If you have any difficulties with the service please email [library@rsc.org](mailto:library@rsc.org), indicating you are a member of the Historical Group. Archive articles from 1940 and beyond are available for the member-reduced fee of £5.*

*Please note that access to articles is for non-commercial fair use only; by "fair" we mean that extensive article downloading is forbidden. Access levels are monitored and any abuse may result in the service being withdrawn temporarily. However, it is hoped that this initiative helps group members in their work. If you have any feedback, please let me or your Chair – Alan Dronsfield – know what you think of the new service.*

*To gain access:*

*First, go to the RSC site listing available archive titles: <http://www.rsc.org/Publishing/Journals/DigitalArchive/available.asp>*

*Click on the title of the journal you wish to view. Remember that only journals up to 1939 are available, free, to Historical Group members.*

*Fill in the details in the box "Find a previous issue" and click on "Go"*

*Click on an article in the "Contents list"*

*Click on "Journals archive purchasers" > PDF*

*The Log-in screen will pop up. Please fill in the details (login name: XXXXXX; login password: xxxxxx) requested. These may change from time to time; if this is the case you will be notified. If your login details are not recognised, please contact [library@rsc.org](mailto:library@rsc.org) for updates.*

You should get a screen that says "Welcome Historical Group". Click on the "Proceed to requested content option", and the article should download.'

Alan Dronsfield  
University of Derby

## ROYAL SOCIETY OF CHEMISTRY HISTORICAL GROUP

### RSCHG Meetings: 2010 and 2011

**2010:** We had two meetings, one so well attended that we had to turn away non-RSCHG members, and another joint meeting which was also well attended.

**The Rise and Fall of ICI:** Friday 19 March 2010; a one-day meeting at Burlington House organised by Jack Betteridge and Bill Griffith. For a report see the August 2010 *Newsletter*, pp. 28-33.

**Celebrating the History of Chemical Information:** Monday 29 November 2010 at Burlington House, at the Chemistry Centre and the Geological Society's lecture theatre. This meeting was in association with the RSC Chemical Information and Computer Applications Group (CICAG) and the CSA Trust. A full report appears in this issue of the *Newsletter*.

**SHAC 75<sup>th</sup> Anniversary Meeting:** Friday 19 November 2010 at the Royal Institution. Although not a joint meeting, a number of RSCHG members attended and enjoyed this celebratory meeting of our sister organisation SHAC (Society for the History of Alchemy and Chemistry).

**RSC National Chemical Landmarks:** There were three in 2010; the Chairman and Secretary always receive invitations to these and we try to attend or ensure that there is Group representation at them. The award to Sanofi-Aventis at Dagenham, East London on 2 July 2010 was attended by Alan Dronsfield and several members (August 2010 *Newsletter* pp. 23-25); at the Pfizer award at Sandwich, Kent on 15 October - we were not represented but an account appears in this issue; the Inorganic Chemical Laboratory, Oxford/John Goodenough Landmark Award on 30 November 2010 was attended by Alan Dronsfield and Bill Griffith, and a report by Alan appears in this issue.

**2011:** This is the UNESCO International Year of Chemistry (IYC) and our main contribution to this will be the March 18 meeting.

**Marie Curie and the History of Radiochemistry:** Friday 18 March 2011, at the Chemistry Centre, jointly with the RSC Radiochemistry group. A flyer is enclosed with this issue: early registration is advised. There is an excellent line-up of speakers; the meeting will be chaired by the President and Chief Executive of the RSC, and will we hope be opened by the French Ambassador.

**Environmental Chemistry: An Historical Perspective** (provisional title): Joint meeting with the Environmental Chemistry Group (ECG) on Wednesday 26 October 2011 at the Chemistry Centre, Burlington House.

Bill Griffith  
Imperial College London

## NEWS AND UPDATES

### Thomas Graham Lectures

Andrea Sella's 2010 Thomas Graham Lecture based on his column in *Chemistry World* "Classic Kit" can be viewed at:

<http://lecturecast.ucl.ac.uk/ess/echo/presentation/8997b424-82ef-4c0c-b60c-9821ed984170>

Bill Griffith's 2009 Thomas Graham Lecture on London chemists at Imperial College and University College London can be found at:

<http://lecturecast.ucl.ac.uk/ess/echo/presentation/9da277a7-6341-491d-a488-f54586624341>

### News from the Chemical Heritage Foundation (CHF)

Recent episodes of the *Distillations* podcast include:

**Episode 111:** A Distillations Carol about the ghosts of chemistry's past, present and future.

**Episode 110:** Essential Elements - Air

**Episode 108:** Essential Elements - Fire

**Episode 106:** Essential Elements - Water

**Episode 104:** Essential Elements - Earth

<http://www.chemheritage.org/>

The website also includes information on the various events for IYC 2011 which launch in the USA on 1 February 2011.

### Roy G. Neville Prize

The Chemical Heritage Foundation (CHF) is now accepting nominations for the 2011 Roy G. Neville Prize. The prize is presented biennially by the CHF to recognize an outstanding published bibliography or biography in the areas of chemistry and related sciences, technologies, or industries (including such topics as alchemy, biomedicine, molecular biology, etc.). The prize will be presented on 13 October 2011, at CHF in Philadelphia, Pennsylvania, USA. The author of the prize-winning work receives a cash prize, a certificate, and travel expenses to accept the award.

Please keep in mind the following criteria for nominees:

The prize may be given to either (1) a monograph that contributes to our bibliographical knowledge of chemistry and related sciences technologies, or industries, in the tradition inaugurated by Henry Carrington Bolton and exemplified in the lifetime achievement of Roy G. Neville; or (2) a major work of biography in the field of chemistry and related sciences, technologies, or industries.

The work must be published during a period of five calendar years immediately preceding the year of competition (2006-2010 inclusive).

The Neville Prize may not be received in absentia, except under extraordinary conditions as approved by the president of CHF.

The recipient is expected to deliver an address at the award ceremony.

The work must be originally published in English.

The work may not be a reprint of an earlier work, a new or amended edition of an earlier work, or a translation.

If a biography, it must be an original work with new insights to offer and should present a full picture of the life of one or more individuals (or things); it may not be a short biographical memoir or an encyclopaedia or dictionary compilation or entry.

If a biography, the work may be a collective biography on more than one individual (though they should have some obvious connection). Histories with short biographical sections will not be considered.

Biographies of 'things' (commodities, diseases, animals, buildings, etc.) may be considered for the prize if they relate to chemistry and related sciences, technologies, or industries.

The work must be written for an adult audience; purely juvenile-oriented works will not be considered.

Five copies of the work must be provided to the prize committee in order for the work to be considered for the prize.

We are accepting nominations until 31 March 2011. Nominations must include the following information and be sent to [Nevilleprize@chemheritage.org](mailto:Nevilleprize@chemheritage.org):

Title of Bibliographical/Biographical Work

Author's Name

Publisher

Date published

Author's Contact Information

Brief description of the nominated work and why it is worthy of prize consideration

Contact information for copies of the work

Nominations can come from the authors or publishers of the work. Nominating a work for the 2011 Neville Prize does not guarantee that the work will be included among the finalists for the prize. The prize committee will determine a short list of finalists from all of the nominees. If the work is among the finalists, the committee will request five copies of the work for consideration.

**Previous prize winners include:**

*The Enlightened Joseph Priestley: A Study of His Life and Work from 1773 to 1804*, (The Pennsylvania State University Press, 2004), by Robert E. Schofield.

*A Well-Ordered Thing: Dmitrii Mendeleev and the Shadow of the Periodic Table*, (Basic Books, 2004) by Michael D. Gordin.

*William Crookes (1832-1919) and the Commercialization of Science*, (Ashgate, 2007) by William H. Brock.

**USEFUL WEBSITES AND ADDRESSES**

**American Chemical Society Division of the History of Chemistry**

<http://www.scs.uiuc.edu/~mainzv/HIST/index.php>

**The British Society for the History of Science**

<http://www.bsbs.org.uk>

**Chemical Heritage Foundation**

<http://www.chemheritage.org/>

**CHEM-HIST: History of Chemistry Electronic Discussion Group**

[http://www.uni-regensburg.de/Fakultaeten/phil\\_Fak\\_I/Philosophie/Wissenschaftsgeschichte/CH.htm](http://www.uni-regensburg.de/Fakultaeten/phil_Fak_I/Philosophie/Wissenschaftsgeschichte/CH.htm)

**Club d'Histoire de la Société Chimique de France**

<http://www.societechimiquedefrance.fr/fr/club-histoire-de-la-chimie.html>

**The Commission on the History of Modern Chemistry (CHMC)**

<http://www-wissenschaftsgeschichte.uni-regensburg.de/CHMC.htm>

**Digital library of the Conservatoire National des Arts et Métiers**

<http://cnum.cnam.fr>

**The European Association for Chemical and Molecular Sciences (EuCheMS)**

For more information, see: <http://www.euchem.org/>

**The Society for the History of Alchemy and Chemistry**

[www.ambix.org](http://www.ambix.org)

For details of how to join the Society, please see the on-line form (follow the links from the main page), or contact the Treasurer and Membership Secretary: John Perkins, 19 Nethercote Road, Tackley, Oxfordshire, OX5 3AW. ([shacperkins@googlemail.com](mailto:shacperkins@googlemail.com)).

**The Society for the Propagation of the Music of the Chemist-Composers**

This is an informal association that has been formed to publicize the music of chemist-composers. The latest newsletter is from November 2010.

<http://faculty.cua.edu/may/SPMCC.htm>

**The Working Party on History of Chemistry (WP)**

Information on the activities of the WP can be found on its website: <http://www.euchems.org/Divisions/History/index.asp>

**Walter Sneader's website 'Sources of information about drugs and medicine'**

<http://historyofdrugs.net>

**Website for the history of science and technology in Europe**

<http://histsciences.univ-paris1.fr/>

**Website based lecture course by Georges Bram, professor of chemistry and history of chemistry at the Faculty of Science, Paris Sud-Orsay**

<http://histoirechimie.free.fr/>

**Website of the Bibliothèque Nationale de France**

<http://gallica.bnf.fr>

**Website of the Historical Centre of the Ecole Polytechnique**

<http://www.polytechnique.edu/home/about-ecole-polytechnique/history-and-heritage/the-major-periods/>

**Website of the Max Planck Institute for the History of Science (Berlin)**

<http://www.mpiwg-berlin.mpg.de/en/index.html>

**Russian Academy of Sciences. Website of the Institute for the History of Science and Technology**

<http://www.ihst.ru>

An English version is available in test mode.

<http://www.ras.ru/en/index.aspx>

**Selection of English-language papers relevant to the history of chemistry**

<http://web.lemoyne.edu/~giunta/papers.html>

**Website for the Nobel Prizes**

<http://nobelprize.org/>

**SHORT ESSAYS**

**The History of Patents in the UK.**

The origins of patent law emerged in medieval times. "Letters patent" were open letters with the King's Great seal. These gave rights that were often granted to foreign weavers and other craftsmen. It allowed them to practise their trade and overcome guild regulations which suppressed competition. The first such letter was granted in 1331 to John Kempe. The regulation of trade was deemed to fall within the provenance of the Crown and letters patent proved to be a useful method of encouraging the formation of new forms of industry and commerce, giving the Crown powerful control over trade. There was no requirement to be inventive, being more to do with the practice of trade and granting favours by the Crown.

During the Tudor years, it became common practice for the Crown to grant monopolies for trades and manufacturers, which included patents for inventions. Patent rights were granted to John of Utynam in 1449 by King Henry VI for a method of making stained glass. During the thirty years from 1561 to 1590, Elizabeth I granted about fifty patents whereby the recipients could exercise monopolies in the manufacture and sale of commodities, such as soap. The Tudor monarchs saw the system of monopolies as a good way of raising revenue. However, unease grew at how the system was open to abuse and the law began to curb such excesses. It was held in *Darcy and Allin*, a case involving a patent on the monopoly of making playing cards, that the King may grant a monopoly patent for some reasonable time, until the subjects were able to learn the teaching of the patent.

James I then issued a number of proclamations against monopolies, but excepted inventions provided they were not contrary to the law, hurtful to the state or trade, or generally inconvenient. The doctrine of public interest was thus introduced into the patent system and the words were later incorporated into the Statute of Monopolies 1623.

In *Clothworkers of Ipswich (1614) Godbolt 252*, patents of a limited duration were recognised by the courts. In this case, a group of tailors, who were incorporated and chartered by King James to sell their services in Ipswich, brought an action against a tailor who was not part of the corporation, but nonetheless practised his trade within the town. It was

agreed by the court that the King could make corporations but thereby could not make a monopoly, “for that is to take away free-trade, which is the birthright of every subject.” This marked the beginning of the end of royal prerogatives as it ultimately led to the *Statute of Monopolies 1623*.

Section 6 of the *Statute of Monopolies 1623*, gave recognition to patents as an exception to the general rule against monopolies. It gave the true and first inventor fourteen years in which he could exploit his invention to the exclusion of others. The fourteen years duration was based on the fact that the duration of an apprenticeship was usually seven years and then there was a requirement for a period of training by a proprietor. However, In *Liardet's Patent (Liardet v. Johnson (1773) 1 W.P.C. 52)* a patent was granted for eighteen years by a private Act because it was accepted that a longer term was needed to allow the proprietor to receive adequate recompense. This was the first case where a written publication in the UK was used to prove prior use or knowledge of the granted patent. It also led to the concept of specification being regarded in consideration for a patent.

The *Statute of Monopolies 1623* remained in force for many years as the sole legislation governing patent law in the UK. During the two hundred years after the Statute, the patent system developed through the work of lawyers and the courts, without government regulation. During the reign of Queen Ann (1702-1714) the law officers of the Crown established a condition of grant that, “...the patentee must by an instrument in writing describe and ascertain the nature of the invention and the manner in which it is to be performed...”.

James Puckle's 1718 patent for a machine gun was the first to be required to have a specification. James Watt also obtained a number of patents on his steam engine in 1796. However, sources of dissatisfaction with the system remained until the end of the nineteenth century, in regards to the common law concerning patents. The Crystal Palace Exhibition in 1851 contributed to official recognition of the need for legislation to meet some of the longstanding criticisms. In 1852, the patent laws were revised via the *Patent Law Amendment Act, 1852*. The patent application was centralised at one Patent Office and the fees were lowered. A renewal system was adopted and provision was made for the printing and publication of patent records. Changes in the British patent system were, in part, motivated by the realization that England's early industrial supremacy was threatened by the US and other nations in Europe.

Further developments included the *Patents Act 1902*, which instituted a limited investigation into the novelty of the invention before a patent was granted. The *Patents Act 1977* was designed to take account of the *European Patent Convention*.

## References

<http://www.ipo.gov.uk/p-history.htm>

Statute of Monopolies 1623, 21 JAC I.C.3.

David I. Bainbridge, *Intellectual Property*, Fifth Edition, (Harlow: Longman, 2002).

B. Zorina Khan, “Intellectual Property and Economic Development: Lessons from American and European History,” Study Paper 1a, Commission on Intellectual Property Rights, (2002)

[www.iprcommission.org/papers/pdfs/study\\_papers/sp1a\\_Khan\\_study.pdf](http://www.iprcommission.org/papers/pdfs/study_papers/sp1a_Khan_study.pdf)

Richard Toon  
Keele University

## Ida Freund, the first woman chemistry lecturer

Ida Freund (1863-1914) was the first woman to become a university chemistry lecturer at a time when the subject was almost exclusively the domain of men. But did she influence the chemistry taught in schools and colleges in the early years of the twentieth century and if so, do any traces of her legacy remain today?

Ida Freund was born in Austria but her mother died when she was just a child and she was brought up by her grandparents in Vienna. She went to the local state school and then to the state Training College for Teachers. In 1881, her grandmother died and she was sent to England to live with her uncle and guardian, the violinist Ludwig Strauss. One year later, Strauss enrolled her at Girton College, Cambridge, which in 1869 had been the first college for women at the University of Cambridge.

### An academic pathway

Despite initially being vehemently against going to Girton - she had no real say in the matter anyway - in time Freund came not only to enjoy university life at Cambridge but she became devoted to it. In 1886, she gained ‘first class honours’ in the Natural Sciences Tripos course, though at the time “women students were permitted to take university exams but were not members of the university, and hence were not eligible for degree status ... it was not until 1948 that women could formally receive degrees from Cambridge University” (1). Instead, women were awarded a certificate of proficiency.

After graduating Freund went to Cambridge Training College for Women as a chemistry lecturer, and one year later joined Newnham College, Cambridge, as a demonstrator. Newnham, founded in 1871, was the second

women's residential college at Cambridge. Three years later, in 1890, she was promoted to lecturer in chemistry at Newnham where she remained until her retirement in 1913. When she arrived at the college in 1887, "women students were not admitted to the University Chemical Laboratory until they had passed Part 1 of the Tripos, and thus Miss Freund was entirely responsible for the [initial] laboratory training of the majority of her students, many of whom came up to College with little or no knowledge of chemistry" (2).



Portrait of Ida Freund by permission of Newnham College Archives, Cambridge

Freund's teaching duties appear to have left her little time for research, she neither studied for a master's degree nor a doctorate. Her only published paper was *The effect of temperature on the volume change accompanying neutralization in the case of a number of salts at different concentrations* (3). This is a meticulous, substantial fifty-eight page paper, written in English and translated into German for publication and complete with many tables of results.

Freund did, however, write two chemistry textbooks. It is these we look to first for evidence of her approach to teaching, and any influence she may have had in the chemistry taught in schools and colleges in the early twentieth century.

### Freund's chemistry texts

Freund's first textbook, *The study of chemical composition: an account of its method and historical development with illustrative quotations* (4), was published in 1904. This was a partial history of chemistry, concentrating on the development of ideas such as the periodic law, valency, the atomicity of matter and the Cannizzaro system of atomic masses. The book was written as a text for teachers who wanted to achieve a deeper insight into the topics in their syllabuses. For its time it was remarkably up to date, with sections on the electron, radioactivity and the noble gases. Indeed, a reprinted edition in 1968 suggests a continuing influence, and today it might profitably be read by individuals interested in the history of chemistry. According to historian M. M. Pattison Muir (5), this book was "among the really great works of chemical literature" and perhaps in its time, it was. But chemistry moves on and the genesis of chemical ideas appeals only to the select few, mainly historians of chemistry, and her book today is largely overlooked.

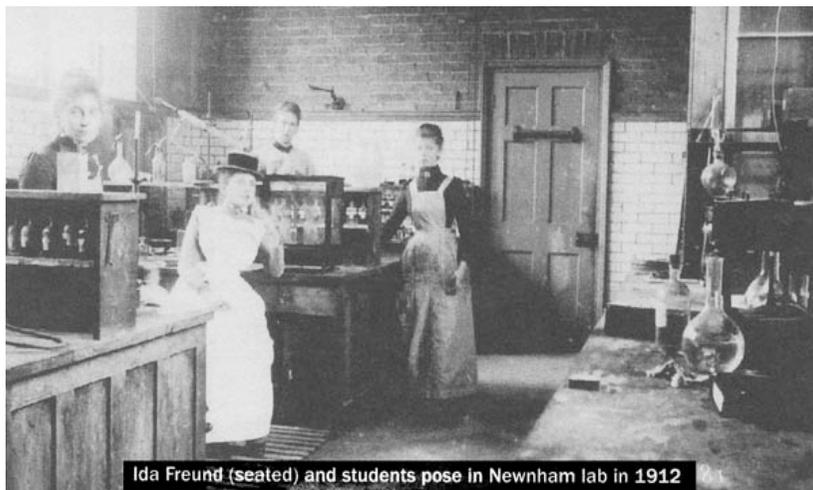
Freund's second textbook, *The experimental basis of chemistry: suggestions for a series of experiments illustrative of the fundamental principles of chemistry* (6), was published posthumously in 1920, and gives more of a flavour of her approach to teaching. In its preface, editors A. Hutchinson and Mary Beatrice Thomas (one of her students and a lecturer at Girton College) suggest that in writing it: "Miss Freund was attempting to bring to the notice of other teachers her views as to the manner in which students may be helped to realise that chemistry is a science based on experiment, and that logical interpretation of experiments leads directly to the generalisation known as the laws of chemistry" (2).

Thomas says of her approach that: "(she) had a dread of thoughtless experiments and slipshod thinking, and that she felt strongly that much that passed for training in science had little relation to scientific method and was of small educational value." Certainly, rigour was Freund's strong point. In her description of a method to find the mass (D) of one litre of HCl gas at 0°C and 760mmHg she applies the rather daunting equation:

$$D = \frac{(w' - w + \frac{d_{air} \times a \times 273 \times p}{(273 + t) \times 760}) \times 1000}{a \times \frac{273 \times p'}{(273 + t') \times 760}}$$

She then worries over the fact that her (or her students') results gave D = 1.688 (leading to a relative molar mass for HCl of 37.8), significantly different from the 1909 accepted value of 1.639 (RMM for HCl of 36.7) (6).

Freund's approach to teaching chemistry was certainly experimentally based, though she had little patience with Henry Armstrong's heuristic approach that pupils should discover chemistry like front-line researchers. According to Freund: "[This] would have us believe that in the course of some couple of hours' work the average pupil can definitely correlate an observed effect with its cause, can discover the nature of a chemical relationship, or can prove a law" (6).



By permission of Newnham College Archives, Cambridge

Instead, Freund advocated the approach favoured by Wilhelm Ostwald in which: "The main facts of chemistry are dealt with in the form of a dialogue between a teacher and a pupil. The method is heuristic in its truest ... sense, but there is ... no pretence about what the pupil really accomplishes for himself and what is done for him. Thus in the investigation of the effect of varying pressure on the volume of a definite quantity of air ... the results [are] recorded in tabular form:

*Pupil:* What is the use of that?

*Teacher:* I want to show you *how to discover a law of nature*. And when, after a number of explanations ... and trials, the relation  $pV = \text{constant}$  has been formulated:

*Teacher:* Right. Now you have found the law which connects the pressure and volume of air with each other, or makes them dependent on each other.

*Pupil:* I should never have found that out without your help.

*Teacher:* I quite agree.

*Pupil:* I say, did *you* find it out by yourself?

*Teacher:* No. An English physicist named Boyle discovered it more than 250 years ago, and it now goes by the name of Boyle's Law" (6).

Freund goes on to say: "Surely, therefore, the more honest, intellectually more bracing and eventually more fruitful course is to sweep away all delusions as to what pupils can discover for themselves, and further to impress on them at as early a stage as possible the fundamental difference between the 'illustrative experiments' they perform and real research" (6).

So this is it. Freund's experiments were designed to demonstrate chemical truths. There was nothing new in this, and until Armstrong's version of heurism, this was the traditional aim of most experimental work. And largely it persists today in our teaching. Freund's contribution was to contextualise almost exhaustively, the experiments her pupils did, and have them perform them with such rigour that the chemical truths were as unambiguous as possible.

The disadvantage of this approach, however, was that pupils progressed slowly which led George Fowles, a distinguished chemical author of the 1930s-50s, to comment on her text: "This work, though full of helpful suggestions, arguments, and keen criticism, constitutes in itself a most weighty objection (to her) method. For in a course intended for university students, and occupying 400 closely packed pages, the author arrives no further than the law of multiple proportions" (7).

### Former pupils

In our search for evidence into the extent of Freund's influence on chemical education, we now turn to testimonials of past students, some of whom later went on to become chemistry teachers or lecturers themselves. Their comments suggest that her work was influential in promoting the subsequent entry and acceptance of women into academic and research careers.

A former student writes: (8) "In my day Miss Freund reigned supreme in the chemistry lab in the garden." (The old laboratories were restored in the 1990s and are now used for concerts, plays and exhibitions.) "She was a great character - Austrian by birth, she wrote excellent English but never managed to speak it. She would break off a sentence and say, 'Have I got you wiz me in zat?'; and on one occasion when a student had had a little argument with her she said, 'Now, Miss X, have I got you wiz me in the hydrochloric acid?' Every year just before the Tripos examination she would summon her chemistry students to do some special study. It was of

course a hoax. In 1907 she urged them to go to the lab to study again the lives of certain chemists. They found large boxes of lovely chocolates ... with a different life-history and picture of some famous chemist in each. In my year we were requested to go and make a further study of the 'Periodic Table of the Elements.' We found a very large board with the Table set out. The divisions across and down were made with Edinburgh Rock, numbers were made of chocolate, and the elements were iced cakes each showing its name and atomic weight in icing. The nonvalent atoms were round, univalent had a protruding corner, bivalent two, trivalent triangular and so on. We divided it up between us!"

"Miss Freund's invitation to the Periodic Table read: 'Your attention is drawn to the desirability - in fact the necessity of perfecting your knowledge of the Periodic System of Classification of the Elements. Whether considered from the point of view of theoretical or of descriptive and classificatory chemistry, Mendeléev's system demands extensive and detailed knowledge, and such time as you can still give to revising (= cramming??) chemistry might, it is suggested, be advantageously spent on this subject. Since however it has always been recognised that a well-arranged and well-spaced out table which allows one to take in at a glance as many facts and relationships as possible, is a desideratum in this matter, you will find at the laboratory such a table provided for your use. This table, whilst in the main following the usual lines, tries to bring out, by means of a tentative symbolism, more facts than it is usual to try and convey. Whether however it is of a kind that would lend itself to extended use as an adjunct to the study of chemistry must be considered doubtful'."

Another Newnham student reminisces about her tutor, Freund, who had lost a leg as a result of a cycling accident in her youth: "Miss Freund was a terror to the first-year student, with her sharp rebukes for thoughtless mistakes. One grew to love her as time went on, though we laughed at her emphatic and odd use of English. Yet, how brave she was trundling her crippled and, I am sure, often painful body about in her invalid chair smiling, urging, scolding us along to 'zat goal to which we are all travelling which is ze Tripos' "(8).

### A leading light

Only a brave minority of university-educated women went on to pursue careers, particularly in teaching. Several teachers were former students at Newnham (9) and they in turn encouraged their pupils to study at Newnham. One such pupil was Mary Beatrice Thomas, who co-edited the Ida Freund textbook, and another was Ida Smedley MacLean (1877-1944), who became a research scientist at the Lister Institute of Preventative Medicine.

Ida Freund was also an active feminist and supporter of women's suffrage. Together with Ida Smedley and Martha Annie Whiteley (1866-1956), a lecturer at the Royal College of Science, she was a leading light among the women who fought for admission to the Chemical Society in the early 1900s (10). Sadly, Ida Freund did not live to see her friend's victory in gaining admission to the Chemical Society in 1920. She died in 1914 following an operation and the Ida Freund Memorial Fund was set up to raise the standard of women teachers in the physical sciences by giving them opportunities for further study. The fund still exists today.

Examination of Ida Freund's textbooks and personal testimonies from students, together with her campaign for the acceptance of women in chemistry on equal terms, suggests that she did have an influence on chemistry teaching in the early twentieth century. The outward ripple effect of pioneer women teachers, including Ida Freund, has spread through successive generations of students and teachers, and inspired girls to study chemistry. Today women comprise about half of all undergraduate chemistry students.

**Acknowledgements:** we thank the Principal and Archivist of Newnham College for their help.

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Margaret Hill and Alan Dronsfield

(This article first appeared in *Education in Chemistry* in September 2004 and is reproduced by kind permission of the authors and the publishing department of the RSC.)

### **A History of World Science: In four objects from the Cuming Museum, Southwark, London, and discussed, assessed and presented, by local children 2000-2001**

During 2010 Neil MacGregor, Director of The British Museum, presented a series of B.B.C. Radio 4 programmes entitled "A History of the World in 100 Objects from The British Museum." What is less well known is that a decade ago, I conceived, wrote and produced a somewhat similar event, but aimed at stimulating interest in local science amongst children in deprived communities such as the Elephant & Castle neighbourhood of Southwark.

That aim stemmed from earlier work of mine which had shown that stimulating interest in local science can best be done via the children in such communities (1). Using that approach, I told a class of ten year olds the emotive story of how badly local John Newlands was treated after he presented his theory of the 'Law of Octaves' to eminent members of the Chemical Society. On hearing this, the children were so moved that they asked if they could act the story. This they did, firstly when they performed my play to great acclaim at an R.S.C. symposium on the periodic table - but also at many Southwark schools and other local events, such as the West



Fig. 1. The start of my Elephant & Castle, Newlands science play of © 1998 D.H. Leaback.

Square Summer Fete shown below in Fig. 1 – in front of Newlands' birthplace and its R.S.C. memorial plaque, which I initiated in 1998.

Fig. 2 E shows a sketch my brother and I made of a magic moment after the original performance, when I had introduced Imperial College's Hofmann Professor of Chemistry, Charles Rees, to the ten-year-old girl who had taken the role of John Newlands in the play. Prof. Rees later told me how impressed he had been by the girl's understanding of Newlands' situation - to which I responded that it was what I hoped to hear as an outcome of my new approach to teaching the history of science such that it encourages children to live, act and to discuss the human side of such a situation involving how science works. I added that we had discussed such matters during rehearsals. The children had identified with young Newlands' disappointment of how his hopes for his theory clarifying the bewildering range of properties of the chemical elements had been dashed by eminent scientists who should have encouraged him to gather more information to prove or disprove his theory. We went on to say that this is how all great theories – like Darwin's evolution, Mendeleev's Periodic Table and the current controversy of man-made climate change have been or will be settled.

Two years later, the chance came to develop this new approach further, by selecting a limited number of historic objects from the local Cuming Museum's collection, and after considering what science has told us about them, letting the children decide which objects' story offered most potential for a play on the future of the world. The four objects chosen are illustrated in Fig. 2, and were:

- B) Crystalline salt mineral with atomic lattice structure determined ca.1930
- C) A drawing by R. Cuming of a bee specimen in the British Museum.
- A) An Egyptian Mummy mask of ca.300 B.C. painted and gilded on wood.
- D) A decorated gourd from one of James Cook's 18<sup>th</sup> C. Pacific voyages.

The Museum Curator and I started a class of ten year olds colouring sheets of outline sketches of the four chosen objects, while we told the children what we planned to do – that was, to outline the background to those objects sufficiently so that each of four selected children would tell an invited audience, not only about one of the objects but also about what science has subsequently revealed of their world importance today. Afterwards we hoped the children would choose one of those objects and I would write a short play for them to act, illustrating the special world importance of that particular object.

Thus, object B was possibly our oldest specimen – being a natural crystalline sample of salt, the like of which man could have noticed and used from distant antiquity and wondered what could account for its beautiful regular crystal pattern and shape. It is now widely known from modern Western science that common salt is composed of sodium and chlorine atoms as positive and negative charged ions arranged in a cubic array as shown in Fig. 2, and which dictates its crystalline shape. Curiously, much of that science inquiry was carried out at the Royal Institution in London, where a youngster, Michael Faraday, from this very Elephant & Castle neighbourhood was so instrumental in developing such work and communicating it to children (2, 3).

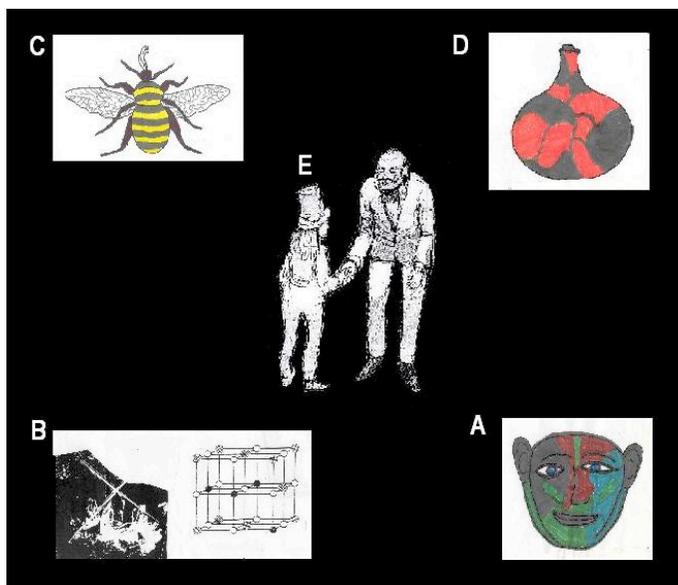


Fig. 2 shows images of coloured Cuming objects, A to D, and one of a magic moment E from the preceding Newlands play described in the text. © 1998 D.H. & S.I. Leaback

Object C: No-one now knows what prompted the young Richard Cuming to make a sketch of a British Museum specimen of a bee. Could it have been the beauty of the museum specimen, or perhaps the current curiosity to understand how such a bulky insect can fly at all? What is known is that at the tender age of 4 years, Richard was given gifts of an ancient Mogul coin and fossil specimens which started him on a life-time of collecting interesting objects from all over the world and linking them to science.

Object A: The Egyptian burial mask, dating from the third century BC, was collected by Richard's son, Henry S. Cuming and follows his father's interest in objects showing technical and scientific contributions from Egypt/Greece and further East.

Object D: A decorated gourd collected from the Pacific Islands by Captain Cook.

The question then arose as to which object the children would choose to act. At first they favoured either B or D. The argument in favour of object B was the value of human ingenuity to produce very useful procedures or devices – like the new one Neil MacGregor recently chose for his hundredth object – a solar powered lamp. When however, the children heard that a James Cook Pacific-surveying, object-collecting voyage had called at the desert-like Easter Island, yet later scientific investigations had revealed that the island was once a lush, near paradise with a thriving culture, but was gradually overwhelmed by over-population and over-exploitation of its resources – the children had no doubt they wanted to act that cautionary story, linked to object D. That pioneering play was enacted a decade ago before an audience of friends, relations and the Mayor of Southwark, crowded into the Cuming Museum, between Cuming exhibits collected surely for occasions exactly like that.

**Acknowledgements:** Grateful thanks to the staff of the Cuming Museum, and Charlotte Sharman and Crampton Primary Schools and to the actors therefrom, together with my wife, brother and sons.

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David H. Leaback

## RSC NATIONAL HISTORICAL CHEMICAL LANDMARKS

### Chemical Landmark Plaque for Pfizer

This pharmaceutical firm, where several world famous drugs were discovered, was awarded with a Royal Society of Chemistry blue landmark plaque on 15 October 2010. The prize was in recognition of more than half a century of discoveries carried out by one of the UK's leading companies, Pfizer. Its European research headquarters site is located in Sandwich, Kent. The company is widely recognised as having been at the forefront of many medicinal breakthroughs over the last fifty years.

Some of those discoveries include *Viagra*, the drug used to treat erectile dysfunction; *Istin*, the world's leading treatment for hypertension and angina; *Diflucan* and *Vfend*, which treat life-threatening systemic fungal infections and, more recently, *CelsSenti*, a promising advance in the war against Aids/HIV, as well as *Dectomax*, which treats parasites in cattle.

In making the award, the RSC said: "Such discoveries are only possible by ensuring the highest level of research and development excellence. The long and consistent track record of the Pfizer, Sandwich, site is fully worthy of recognition under the Royal Society of Chemistry Chemical Landmark Award Scheme." Dr Simon Campbell, who only a week earlier had been designated as thirty-first in the *Times*' "Eureka list of the 100 most important people in science", is a former research leader at Pfizer and a past president of the RSC. He said: "I am very pleased Pfizer has received such a well deserved Landmark. This award recognises the innovation and dedication of thousands of Pfizer scientists in the discovery and development of innovative new medicines which have brought significant benefit to millions of patients world wide." Dr Campbell was also involved in the research teams that produced *Cardura*, also used to treat high blood pressure and angina, and *Norvasc*, for high blood pressure and prostate enlargement.

The plaque was presented on behalf of the RSC by our immediate past president, Professor Dave Garner. Rod McKenzie, Senior Vice-President, Pfizer Research and Development said: "I am very proud to receive this award on behalf of Pfizer and our Sandwich site. Sandwich has long been a chemistry powerhouse, built on the passion and desire of generations of outstanding scientists to change lives for the better. It is a wonderful testament to the many groundbreaking contributions to medicine Sandwich has made over the site's fifty-six year history."

Alan Dronsfield

(adapted from an RSC press release prepared by Paul Gallagher, Media Relations Executive)

### **Inorganic Chemical Laboratory, Oxford/John Goodenough Landmark Award**

The latest presentation of an RSC National Chemical Landmark plaque took place on 30 November 2010 in the Inorganic Chemistry Laboratory of the University of Oxford. It commemorated the laboratory as the site where John Goodenough and his team developed the cathode material that rendered feasible the construction of the first lithium-ion rechargeable battery. Today these devices power mobile phones, laptop computers, portable hand tools and electric vehicles. The plaque reads:

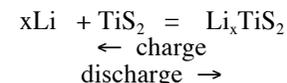
**Inorganic Chemistry Laboratory**  
where in 1980, John B. Goodenough with Koichi Mizushima, Philip J. Jones and Philip J. Wiseman identified the cathode material that enabled the development of the rechargeable lithium-ion battery.  
This breakthrough ushered in the age of portable electronic devices.

At the ceremony greetings were received as a pre-recorded speech from Professor Goodenough from his laboratory in the USA. Present at the ceremony itself were Drs Mizushima, Wiseman and Jones.

Some 100 friends and guests were welcomed to the Laboratory by Peter P. Edwards, Professor of Inorganic Chemistry and by Dr Richard Pike, Chief Executive of the RSC. Peter spoke briefly of the great contribution that John Goodenough and his team had made to science, industry and society by their discovery. This theme was expanded upon, historically, by Dr Phil Wiseman who presented a personal perspective of the events that led up to the discovery of the lithium ion rechargeable battery and the discovery itself.

The plaque was presented on behalf of the RSC by Richard Pike and received on behalf of the Department and University by the Vice-Chancellor, Prof. Andrew Hamilton.

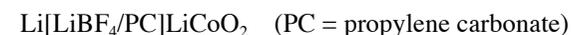
The forerunner to the discovery being commemorated was the sodium-sulfur battery. This had a high energy density, long cycle life and could be fabricated from cheap materials. However it needed an operating temperature of 300-350°C, which limited its uses essentially to non-mobile applications such as grid energy storage. M. S. Whittingham demonstrated a system that could operate as low as room temperature in 1976. Lithium was reversibly inserted into, and extracted from, a  $\text{TiS}_2$  positive electrode:



But this was not ideal as the lithium metal used to redeposit *across* the cell rather than ending up "plating" the electrode, thus causing electrical shorts and limiting the number of operational cycles.

The Oxford team used lithium in conjunction with lithium cobalt oxide that overcame this problem, whilst maintaining the attractiveness of room temperature operation

The cell is



and the cell reaction is



Their findings were published in *Materials Research Bulletin* 1980, **15**, 783-789. The report concluded with the statement that "Further characteristics of the intrinsic and extrinsic properties of this new system are being made." Little did they envisage that thirty years later that almost everyone from five years upwards would have an application of their work in their pockets: the ubiquitous mobile phone, powered by a rechargeable lithium-ion battery.

John B. Goodenough received a B.S. in Mathematics from Yale University in 1944 and a PhD in Physics in 1952 from the University of Chicago. During his early career he was a research scientist at MIT's Lincoln Laboratory as part of an interdisciplinary team developing random access magnetic memory. During the late 1970s and early 80s he continued his career at the Inorganic Chemical Laboratory, Oxford, where he identified and developed  $\text{Li}_x\text{CoO}_2$  as the cathode material of choice for the lithium-ion rechargeable battery. Although the Sony Corporation is responsible for the commercialisation of the device (first marketed in 1991) he is widely credited for its original identification and development. At present he is working at the University of Texas, Austin, where he is developing a new class of iron phosphate materials to replace the more costly cobalt components in rechargeable batteries.

The Historical Group was represented at the Award by Bill Griffith and Alan Dronsfield.

Alan Dronsfield

## MEETING AND CONFERENCE REPORTS

### **Celebrating the History of Chemical Information: Monday 29 November 2010**

This conference was organised by the RSC Chemical Information and Computer Applications Group (CICAG) and the CSA Trust in association with the RSC Historical Group. Lectures were held in the Geological Society's lecture theatre, Burlington House, but both the large exhibition of historic and present-day material and the lunch were held in the adjacent Chemistry Centre. The meetings were chaired by Dr. Diana Leitch, Information Consultant, who, in welcoming the many delegates, congratulated them on braving both inclement weather and the day-long London Underground strike. There were some 120 people present, with CICAG members in the majority.

## Abstracts

### **Dr. Doug Veal** (CICAG); *The Contribution of the RSC*

The Royal Society of Chemistry and its predecessor organisations have made major contributions to chemical information over the last 170 years. Primary publications have always been a key activity of the Society but in recent years the number of journals published has increased significantly, whilst maintaining high quality. All primary journal articles are now available in an electronic archive. Secondary services have been provided for many decades, for the early part of the twentieth century by British Chemical Abstracts and latterly by collaboration with the Chemical Abstracts Service. The Society's library was founded in 1841 and has grown enormously since. The library is now largely virtual, with access to information provided electronically. A comprehensive information service is provided. Access to databases is a key part of the service and is constantly developing, most recently by the acquisition of ChemSpider. The RSC has consistently supported and contributed to international efforts in chemical information, for example by participation in IUPAC and ICSU-AB. The Chemical Information Group (now the Chemical Information and Computer Applications Group) has organised meetings, generally two a year, on subjects relevant to chemical information since its formation in 1967.

### **Dr William Town** (President, Kilmorie Clarke Ltd); *The Language and Symbolism of Chemistry*

Chemistry and the language and symbolism of chemistry developed in parallel. Even the alchemists had evolved a complicated symbolism to represent and, at the same time, obscure their knowledge of the art of chemistry. As chemistry, emerged as a respected science in the late eighteenth and early nineteenth centuries, new methods of representing chemical knowledge evolved. The history of chemical symbolism and language was addressed and also the organisation of chemical knowledge in some of the major handbooks and the development of the first periodic tables.

### **Dr Engelbert Zass** (Head, Chemistry Biology Pharmacy Information Centre, ETH Zurich); *Chemical Literature*

Chemical information is typically dominated by structures of chemical compounds, and by the structuring of the chemical literature into primary, secondary, and tertiary sources. This organization is essential in chemical information retrieval, and thus appeared quite early in the history of chemistry as a modern science. This talk explored this aspect and Dr Zass emphasised the role that traditions and conventions that were created in a

paper world still play in today's electronic environment. Real and potential changes concerning e-journals, e-books, and databases, are driven by opportunities provided by technology, and by changed user perception and behaviour. Compared to other sciences, however, the present system of chemical literature and its major players (such as abstraction services) are rather conservative, and dominated by commercial interests.

After lunch in the Chemistry Centre (during which time Prof. David Phillips, the new RSC President, welcomed guests), the sessions continued with Diana Leitch as chairman.

**Dr Phil McHale** (Executive Director, Enterprise Information, CambridgeSoft Corporation, USA); *Chemical Structures*

Representations of chemical structures, whether hand-drawn on a napkin, displayed on a screen or printed in a journal or patent, provide a *lingua franca* for chemists, and the language of chemical structures has evolved to keep pace with our increasing understanding of the nature of bonds and the spatial arrangements of atoms within molecules. Some early dialects such as linear formulae only conveyed partial information, and the apparently complete descriptions afforded by linear notations were reserved for the cognoscenti and spoken by very few practising chemists. The talk surveyed this evolution in handling structures and illustrated how parallel developments in structural representation, technology (graphics terminals), and informatics (connection tables) have made handling chemical structures a commonplace activity, and have increased the roles which structures can play in chemistry-related endeavours.

**Dr Helen Cooke** (R&D IT, GlaxoSmithKline, Philadelphia); *Databases*

Chemists think and communicate structures, and chemists' information requirements are mostly compound, structure and reaction centric. The ability to search information sources (printed and electronic) by structure has been the focus of chemical information, and has differentiated chemical information systems from those for other disciplines. This has brought specific challenges regarding the electronic storage and retrieval of chemical information, necessitating many innovations to develop solutions. Chemical structure-based databases have been essential tools to enable chemists to find information for over thirty years. This talk presented a brief history of their development, including an overview of the drivers (e.g. the literature explosion, the need for timely information in the pharmaceutical and chemical industries), precursors (e.g. punched cards), and enablers (e.g. advances in telecommunications, development of codes to enable storage of structures by computers). Landmarks in the development and evolution of chemical structure databases from the 1970s to the early 2000s were

highlighted. The presenter's own experiences as a chemical information specialist were included throughout, with reflections on the changing role of librarians and information scientists, the evolving search experience, and the re-empowerment of end-user searchers.

**Professor Alexander Lawson** (Director of R&D, Elsevier Properties SA, Neuchâtel); *Data: The Record of What we Think we Know, and Why*

The history of data collections in chemistry has been strongly influenced not only by the need for standardization of definitions of terms, but also by two further time-dependent factors: the evolution of data to information (and ultimately knowledge), and the practical needs of the user community. The talk discussed these trends with respect to the continuous development of major databases in the core areas of organic and inorganic chemistry.

**Professor Peter Willett** (Information School, University of Sheffield); *Chemoinformatics: Historical Development of Database Methods*

The term 'chemoinformatics' only started to be used at the end of the last century, but many of its constituent techniques have been studied for many years. This talk provided an historical overview of its development since its genesis in studies of methods for searching databases and predicting biological properties that took place in the late Fifties and early Sixties (1, 2). It focused on the former methods, with only passing mention of the concurrent development of QSAR and modelling techniques. The following areas were mentioned: substructure and similarity searching in files of 2D chemical structures; the representation and searching of chemical reactions and of the generic structures that characterise many chemical patents; computer-aided synthesis design as an example of an artificial intelligence application in chemoinformatics; the searching of pharmacophoric patterns in databases of 3D chemical structures; protein-ligand docking; and more recent studies of molecular diversity and drug-likeness. Current key areas of research include the prediction of the ADME and toxicity properties of molecules, and studies of a range of methods for virtual screening.

W. L. Chen, "Chemoinformatics: past, present and future," *Journal of Chemical Information and Modeling*, 2006, **46**, 2230-2255.

P. Willett, "From chemical documentation to chemoinformatics: fifty years of chemical information science," *Journal of Information Science*, 2008, **34**, 477-499.

**Professor Robert Glen** (Unilever Centre for Molecular Science Informatics, University of Cambridge); *Chemical Information: The Future*

William Gibson said "The future is here. It's just not widely distributed yet." The means to make all of chemical knowledge available on demand is surely

within our grasp. There is a lot of it – from a connected world in which there are more chemists alive today creating more data than ever existed in history. Capturing, processing, semantifying, searching and displaying the information we need – on demand, will need technology, ideas and new approaches to open information. The problems to solve are both technical and social. Future chemists will view chemistry differently – as we view the alchemists as distinct in their objectives and philosophy compared to today’s scientists. The next generation of chemical tools will need to better reflect the experimental data they attempt to capture, and the abstractions made in today’s systems will disappear as computer and human evolution converges.

A lively discussion followed. Diana then brought the meeting to a close and thanked all the speakers for an excellent series of presentations. Prof. Alan Dronsfield (University of Derby and Chairman of the RSCHG) thanked Diana for all the tireless work she had put into a very rewarding day. The meeting ended at 17.15.

Bill Griffith

## SHAC Anniversary Meeting

On 19 November 2010 the Society for the History of Alchemy and Chemistry (SHAC) held a meeting at the Royal Institution to celebrate the seventy-fifth anniversary of the founding of the Society. Around seventy people attended the meeting not only from the UK but from as far afield as Montreal, Norway, Germany, Italy and the USA. It was a wonderful occasion to meet up with colleagues from past SHAC, RSCHG and EuCheMS Working Party on History of Chemistry meetings and from the Chemical Heritage Foundation.

The afternoon session was based around the theme “The History of the History of Chemistry.” Papers were given by Bill Brock (University of Leicester) on “Exploring early modern chymistry: the first decade of the Society for the History of Alchemy and Chemistry” which contained some fascinating revelations from the Society’s archives, which have recently been deposited at the Museum of the History of Science in Oxford. Frank James (Royal Institution) then spoke on “The Two Cultures and the history of chemistry.” Marcos Martínón-Torres (University College London) spoke on “Recent Developments in the history of alchemy.” The final paper in this session was by Marco Beretta (University of Bologna) on “The changing role of history in the identity of continental chemistry.”

After tea, Hasok Chang (University of Cambridge) chaired a panel discussion with Maurice Crosland (University of Kent), David Knight (University of Durham) and Colin Russell (Open University) entitled “The Good Old Days?” Following a reception in the Royal Institution Museum,

Simon Schaffer (University of Cambridge) gave a public lecture “The Unfortunate Chemist – Tribulations of chemical philosophy in an Age of Revolution.” Dinner in the Royal Institution’s restaurant, Time and Space, followed and the day was brought to a close with a few words from SHAC’s Chairman, Robert Anderson, and the Science Writer, Philip Ball.

A full report on the SHAC anniversary meeting will appear in the next issue of the RSCHG Newsletter.

Anna Simmons

## FORTHCOMING MEETINGS

### Royal Society of Chemistry Historical Group Meetings

Spring meeting: Friday 18 March 2011

The Group has planned in conjunction with the Radiochemical Group, a whole day conference on Marie Curie and the history of radioactivity. This will be on Friday 18th March 2011 and will be a high profile event for the RSC.

We have lined up a distinguished list of speakers, including the nuclear scientist Dr Serge Plattard (presently Counsellor for Science and Technology at the French Embassy) to give the keynote lecture on *Marie Curie – her life and work*. The French Ambassador has been invited to open the conference, the first session of which will be chaired by the RSC’s Chief Executive, Dr Richard Pike. Negotiations are in place to conclude the conference with an early-evening wine and cheese reception at Burlington House (funded, we hope, by the RSC) for attendees and speakers. The event will be open to RSC members generally, including members of the Radiochemical Group, and there will be a limited number of bursaries for attendance (not travel costs) for students.

Members will recall that I had to open a waiting list for our meeting, *The Rise and Fall of ICI*. It is likely that we will have to do the same for this meeting. Please do return the flyer enclosed with this newsletter, preferably by email, as soon as possible.

Bill Griffith

### Society for the History of Alchemy and Chemistry Meetings

#### Oxford History of Chemistry Seminars

Organized by Oxford University, Oxford Brookes University, Maison Française d’Oxford and the Society for the History of Alchemy & Chemistry. All welcome.

“**Mastering Nature? Chemistry in History**” - Programme 2011

Wednesday 9 February 2011: 3-5pm

**Forensic chemistry & medicine in nineteenth-century France & Britain**

*Oxford Brookes University, Buckley Building, Gypsy Lane, Headington*

Jose Ramon Bertomeu (University of Barcelona), “Sense and sensitivity: toxicology and normal arsenic in nineteenth-century France.”

Cassie Watson (Oxford Brookes University), “Forensic medicine and chemistry in nineteenth-century Britain: theory and practice.”

Wednesday 23 February 2011: 3-5pm

**New Researchers: apothecaries in early modern Europe**

*History Faculty, George Street*

Valentina Pugliano (Oxford University), “Between albarelli and vipers: the intellectual life of the sixteenth-century apothecary connoisseur.”

Samir Boumediene (Ecole Normale Supérieure, Lyon), “Europeanizing American remedies: the preparation of drugs in apothecaries’ back-shops in the seventeenth and eighteenth centuries.”

Wednesday 2 March 2011: time to be confirmed

**The search for natural products in the twentieth century**

*Maison Française, Norham Road*

A showing of the film “*L’if aux frontières de la vie/The yew, beneficial poison*,” will be followed by a discussion with the director, Jean-Luc Bouvret. The film won first prize in the “Mutualités” section of ImageSanté, at the 2010 International Health Film Festival, Liège.

Wednesday 9 March 2011: 3-5pm

**Physical chemists**

*History Faculty, George Street*

Bill Brock, (University of Leicester), “The nine lives of Sir William Crookes.”

Brigitte van Tiggelen, (Memosciences, Louvain), “Walter and Ida Noddack-Tacke, a collaborative couple in chemistry.”

Saturday 28 May 2011: 10am-5pm

**Alchemy and chemistry: continuities and fractures**

*Oxford Brookes University, Buckley Building, Gypsy Lane, Headington*

Colloquium in conjunction with the University of Lille and the Department of the History and Philosophy of Science, Cambridge. Details to be announced.

Further details, including maps & directions, can be found at <http://www.history.ox.ac.uk/hsmt/histchem/>.

Convenors: Pietro Corsi, John Christie, Robert Fox, Muriel Le Roux, John Perkins, Viviane Quirke

**Sites of Chemistry, 1600-2000**

SHAC is sponsoring a four-year project to investigate the sites where chemistry has been practised since 1600. The Wellcome Trust has awarded £11 000 to fund the first two years of the project.

From its immediate origins in the seventeenth century chemistry has been practised in a wide range of physical spaces and places, from the princely court to the apothecary’s shop, from the learned society and the lecture theatre to the university research laboratory, from the craftsman’s workshop to the industrial R and D laboratory. In each of these, and in many other locations and at different times, chemical practice (which includes research, teaching, studying, industrial application and routine analysis, and theoretical debate) has been set within differently structured physical and social spaces and carried out by various actors for different ends. A growing number of scholars have explored particular examples of the various sites of chemistry, but so far little attempt has been made to exploit the opportunities that these studies present for comparative analysis, for exploring the development of chemistry outside the major and well-known institutions, or for exploring the development of chemical practices over the long term. As an experimental science the most important site for chemistry was and is the laboratory and our understanding of its critical development into the knowledge factory in the nineteenth century is still dependent on the ground-breaking work of J.B. Morrell in the 1970s, in particular his “The Chemist Breeders: The Research Schools of Liebig and Thomas Thomson,” *Ambix*, 1972, **19**, 1-58. A number of recent studies have pointed to the wider contexts of this evolution and suggest that it is time for a re-examination of this influential interpretation.

This series of two-day annual conferences from 2011 to 2014 will bring together a number of historians in order to explore the physical spaces and places where chemistry has been practised from the seventeenth to the twentieth century. Each year will focus on a different century (broadly defined), beginning in July 2011 with the eighteenth century, the nineteenth century in June 2012, the twentieth century in June 2013 and returning to the seventeenth century in 2014. This chronological ordering will avoid a clash with a number of international events on alchemy and chemistry in 2011, and more importantly will coincide with an exhibition project on early-modern chymistry in the seventeenth-century basement laboratory in the Museum of the History of Science in Oxford.

The work presented and discussed at each annual conference will provide the opportunity to explore and compare (both geographically and temporally) particular sites of chemistry. The conferences will also provide the opportunity to explore the wider social, economic, political and cultural contexts for chemistry and the wider forces and influences that were at work on it. This will be done through detailed examination of the physical and social sites where chemical actors encountered and engaged with those operating in these wider spheres, whether they were other scientists, political figures, bureaucrats, administrators, industrialists, craftsmen, physicians or engineers.

The immediate focus of each conference will be on microhistories, comparative analysis and developments over the short to medium term. Papers from each annual conference will be published as special issues of the journal *Ambix*. At the end of the project a collection of commissioned essays exploring developments over the long-term and in geographical breadth will be published as *Places and Spaces: Historical Perspectives on the Practice of Chemistry*. The papers on chemistry and medicine will be published as *Chemical Spaces and Medical Practices, 1600-2000*.

The emphasis will be mainly, but not exclusively, on chemistry in Europe. The organizers are particularly keen for graduate students and new researchers to participate in the project.

The first conference, on eighteenth century sites of chemistry, will be held at the Maison Française d'Oxford, 4-5 July 2011.

The project is run by a co-ordinating committee: Antonio Belmar (Alicante), Marco Beretta (Florence), Ernst Homburg (Maastricht), Muriel Le Roux (Paris/Oxford) and John Perkins (Oxford). The committee is supported by a steering group: Bernadette Bensaude-Vincent (Paris), Jose Ramon Bertomeu (Barcelona), Ana Carneiro (Lisbon), John Christie (Oxford), Stephen Johnston (Oxford), Bernard Joly (Lille), Ursula Klein (Berlin), Peter Morris (London), Faidra Papanelopoulou (Athens), Larry Principe (Johns Hopkins), Viviane Quirke, (Oxford), Carsten Reinhardt (Bielefeld), Lissa Roberts (Twente) and Geert Vanpaemel (Louvain).

For further information contact John Perkins, [jperkins@brookes.ac.uk](mailto:jperkins@brookes.ac.uk), and Antonio Belmar, [belmar@ua.es](mailto:belmar@ua.es).

### **American Chemical Society - Division of the History of Chemistry**

#### **Extracts from Fall 2010 Newsletter**

Message from Jan Hayes, HIST Division Chair 2009-2010

It is hard to believe that this is my last newsletter report to you as chair of HIST. Thank you all for being a part of this wonderful part of ACS. The past two years have been a time of change for HIST, for ACS, and for most of us as professionals and individuals.

What has happened and what is coming for HIST?

1) Meeting programming: Seth Rasmussen has done a wonderful job as our new program chair. He has tried to encourage new and different programming for our national meetings. I encourage each of you to work with him to bring new symposia into our future national meetings and to regional meetings. Archaeological Chemistry symposia have been a reoccurring feature in HIST. There is a group interested in organizing the Twelfth Symposium. Are you interested in being a part of this? If so, please contact Joe Lambert, Ruth Ann Armitage, James Burton, Kathryn Jakes ([kjakes@ehe.osu.edu](mailto:kjakes@ehe.osu.edu)), and/or Tom Strom, 2011 HIST Chair ([tomstrom@juno.com](mailto:tomstrom@juno.com)). We would like to add co-sponsoring divisions, so we need your help. Spring 2009 ACS meeting was the initial presentation of a planned semi-regular series of symposia on the Science and Legacy of Former ACS Presidents. The first program was honouring Henry Eyring of the University of Utah. At the Fall 2010 meeting, HIST will present, with co-sponsor WCC, the second of the series honouring Anna Jane Harrison of Mt. Holyoke College, the first woman ACS president.

2) New Bulletin Editor: We are pleased to announce that Carmen Guinta, a current associate editor of the Bulletin, has agreed to follow Paul Jones and become our new Bulletin Editor. There are insufficient words to express our gratitude to Paul for his leadership and hard work as the Editor. We know that Carmen will continue in reaching the high standards which our journal has reached. But Paul promises he will not go away but still stay active in HIST as this assignment closes. Thank you Paul.

3) Awards: As you may be aware, no Edelstein Award will be given in 2010 as a result of changes in funding. Starting in 2010, we will change the title of this award to the HIST Award for Outstanding Achievement in the History of Chemistry, established by Sidney M. Edelstein, with support from Vera Mainz and Gregory Girolami and the Chemical Heritage Foundation. Information will be available on the HIST website for details on nominations for the 2011 HIST Award.

<http://www.scs.illinois.edu/~mainzv/HIST/index.php>

We are continuing with our other two awards for Outstanding Papers in *The Bulletin* and recognitions of Citations for Chemical Breakthroughs.

4) Elections: A nomination committee is now working in preparation for a Fall 2010 election for Chair Elect 2011-12 (who will become chair for 2013-14); Secretary-Treasurer; and Councillor. If you have interest in sharing your talents with your division, please contact me. Again, thank you for your support. I look forward to continuing to serve you as Past Chair in support of Tom Strom as 2011 chair. HIST is your division to meet your needs for your professional and personal interests. Let us hear from you on how we can better serve you.

Jan Hayes

Message from Tom Strom, HIST Division Chair 2011-2012

I am feeling a little intimidated by the thought that I will become Chair of HIST this next January 1. The intimidation factor comes about because of the high quality of preceding chairs, such as Jan Hayes, Roger Egolf, and Jeff Seeman, to name just the three most recent. However, I reflect that, with the wonderful slate of HIST officers, both present and those to be elected, and with the diverse, intelligent group of HIST members, I can't go very far wrong.

My goals are the expected ones of increasing the numbers in and visibility of HIST. Surely all of you share those goals and are willing to help HIST achieve them. I think we can partner with other divisions to present and celebrate their individual histories. The Baekeland symposium of last spring, which POLY and PMSE co-sponsored, and the upcoming "Pioneers of Quantum Chemistry" symposium, cosponsored by COMP and PHYS, can be models for partnerships of this type.

One ongoing concern that I have is the relatively small numbers of contributed papers. The contributed papers this spring went up over those from last fall, but the number for Boston has declined again. I think EVERY member of HIST has an oral presentation lurking in his/her consciousness. It might involve a mentor, a colleague, an institution, a research path, a book, an instrument, etc. It's there if you dig deep, and remember, with HIST you can be sure of an oral presentation.

Please contact me via e-mail at (tomstrom@juno.com) to share your ideas. I look forward to meeting many of you personally in the next few years.

E. Thomas (Tom) Strom

Denver, 27-31 March 2011

General Papers. Seth C. Rasmussen, Department of Chemistry and Molecular Biology, North Dakota State University, Fargo, ND 58105, Phone: 701-231-8747, seth.rasmussen@ndsu.edu

IYC 2011: A Philatelic Celebration. Dan Rabinovich, Department of Chemistry, University of North Carolina at Charlotte, 9201 University City

Boulevard, Charlotte, NC 28223, Phone: (704) 687-4442, Email: drabinov@unc.edu and; Ron Hill, 7590 West Caley Drive, Littleton, CO 80123, Phone: (303) 241-5409, Email: hillwright@mac.com

## Calls for Papers

### 8<sup>th</sup> International Conference on History of Chemistry (ICHC)

"Pathways of Knowledge"

The Working Party (WP) on History of Chemistry of the European Association for Chemical and Molecular Sciences (EuCheMS) will hold its bi-annual International Conference on History of Chemistry (8<sup>th</sup> ICHC) in Rostock, Germany, from 14-16 September 2011.

From 12-14 September 2011 the National Conference of the Working division on History of Chemistry of the German Chemical Society will be held in Rostock, too. At this conference historians of science and technology and chemists will meet around several themes in history of chemistry. Everybody has the interesting option of visiting both events in Rostock.

The 8<sup>th</sup> ICHC will focus on the theme "Pathways of Knowledge." This theme is in direct connection to the general aim of the conferences organized by the WP, namely to facilitate communication between historically interested chemists and historians of chemistry from all over Europe. Previous conferences organized by the WP were held in Budapest in 2003 (Communication in Chemistry in Europe), Lisbon 2005 (Chemistry, Technology and Society), Leuven 2007 (Neighbours and Territories: The Evolving Identity in Chemistry) and Sopron 2009 (Consumers and Experts: The Use of Chemistry and Alchemy).

Deadline: Scholars who want to present a 20 minutes paper at the conference are invited to submit with the help of the online-registration system a one-page abstract before 4 **February 2011**. The instructions to authors will be available at [www.gdch.de/ichc2011](http://www.gdch.de/ichc2011)).

Contact

(a) For questions concerning the Scientific Programme:  
Peter Morris, the Chairman of the International Programme Committee, at [peter.morris@nmsi.ac.uk](mailto:peter.morris@nmsi.ac.uk)

(b) For questions concerning the local arrangements:  
Caroline Kilb, Gesellschaft Deutscher Chemiker e.V., [c.kilb@gdch.de](mailto:c.kilb@gdch.de)

Gisela Boeck, Institut für Chemie, Universität Rostock at [gisela.boeck@uni-rostock.de](mailto:gisela.boeck@uni-rostock.de)

## **Hazardous Chemicals: Agents of Risk and Change (1800-2000)**

Conveners: Deutsches Museum Research Institute; Department of History, Maastricht University; and Rachel Carson Center for Environment and Society

Location: Deutsches Museum, Munich, Germany

Date: 27-29 April 2012

The Research Institute of the Deutsches Museum, the Department of History at Maastricht University and the Rachel Carson Center for Environment and Society are planning a joint workshop to be held at the Deutsches Museum, Munich, in April 2012 dealing with the history of hazardous chemicals.

Chemistry is undoubtedly a science with a great social and economic impact. During the past two centuries millions of new substances have been described, and thousands of them have become novel industrial products. In several cases the scale of production, together with by-products and wastes, has led to previously unknown effects on human health and on the environment. Growing awareness of the impacts of hazardous substances on the economy, society and the environment has stimulated new scientific insights, discussion of risk perception, and new legislation. Advances in analysis and detection of chemicals have played a large role in this respect. Since the 1960s, industrialized countries have adopted a framework for assessing and regulating toxic chemicals that remains in force today. By this means attempts have been made, with varying degrees of success, to control individual pollutants using scientific and technical tools, including risk assessment, toxicological testing, epidemiological investigations, pollution control devices, trace measurements, and waste treatment and disposal technologies.

The present workshop will focus on the interaction between (a) the growing presence of hazardous substances in the economy and the environment, and (b) the cultural, scientific, regulatory and legal responses by modern society to these hazards. In each paper a specific chemical, or group of related chemicals, will take centre stage: from the start of its industrial production, via the proliferation of its uses, and the discovery of its effects on workers, consumers and/or on the biosphere, to attempts to control its emission and use, including the development of alternative products. The workshop will focus in particular on the history of specific chemicals which have had a profound impact on the way in which ecological and health effects have been perceived. Using a 'biographical approach' it will trace the entire 'life history' (production, use, problems, risk assessment, management strategies, and disposal) of those hazardous substances, culminating at the point at which legislative controls or alternative technical pathways were finally

established. The focus will be on the main period of chemical industrialisation (ca. 1800-2000).

*Examples* of substances that have had profound effects on ecological thinking and on legislation, and which would be welcome candidates for analysis using this kind of 'biographical approach,' are: Arsenic, lead, mercury, cadmium, nitrates, cyanides, sulphur dioxide, radioactive substances, DDT and other halocarbons (including dioxins), aniline and aromatic amines, benzene, azo dyes, vinyl chloride, CO<sub>2</sub>, PCB's, and CFC's. Of course, papers on other important cases are also most welcome!

In all cases, we prefer papers having a global or at least an international outlook; national overviews could certainly also be of great value. However, studies which have a regional or local focus are unsuitable in the context of this workshop.

Since the approach to this topic is interdisciplinary, chemists, toxicologists, historians of science and medicine, environmental historians, sociologists and scholars, active in environmental organisations, etc., are all invited to participate and to contribute a paper.

Papers that satisfy the final reviewing procedure will be published in a volume with the working title *Hazardous chemicals: Agents of risk and change (1800-2000)*. Papers should be no longer than 10,000 words. The conference language will be English.

The Rachel Carson Center will cover the travel cost and accommodation expenses for all participants invited to deliver a paper. The conference will take place in the Kerschensteiner Kolleg of the Deutsches Museum in Munich.

For the present we would like those interested in participating in the workshop to forward an abstract of the proposed paper, of approximately 600-800 words, as well as a CV. Please send these documents to the three organisers of the workshop:

Ernst Homburg (e.homburg@maastrichtuniversity.nl), Elisabeth Vaupel (e.vaupel@deutsches-museum.de) and Paul Erker (Paul.Erker@carsoncenter.lmu.de) before 1 July 2011.

Papers will be pre-circulated and should be received no later than 1 February 2012.

## **FORTHCOMING CONFERENCES**

### **7<sup>th</sup> Laboratory History Conference**

Leuven, 6-8 June 2011

The 7<sup>th</sup> Laboratory History Conference will be organized in Leuven (Belgium) from 6-8 June 2011. This conference is the first Laboratory History Conference to be staged in Europe. Earlier conferences have been organized in Baltimore (2009) and Brookhaven (2010). Host of the conference is the *Research Unit Cultural History after 1750* at K.U. Leuven (<http://www.arts.kuleuven.be/culturalhistory/>).

The aim of the conference is to investigate the history of the modern laboratory in relation to its institutional environment, ranging over national styles of research, different disciplines and both formal and informal functions. We welcome contributions that address such topics as the early modern laboratory; the laboratory in the colonial and developing world; field stations, observatories, research vessels and other non-traditional laboratories; the practice of testing, measuring and quality control; biomedical laboratories and clinics; virtual laboratories and the cultural representation of the laboratory. We are also interested in papers that discuss strategies for documenting the history of the laboratory, such as oral sources, archives, photography, and 'born digital' records.

The deadline for papers has already passed on 15 January 2011. Acceptance of the papers will be announced in early February.

For further information please contact Prof. Geert Vanpaemel or Eline Van Assche at [labhist7@arts.kuleuven.be](mailto:labhist7@arts.kuleuven.be).

### **Renewing the Heritage of Chemistry in the 21<sup>st</sup> Century: Conversations on the Preservation, Presentation and Utilization of Sources, Sites and Artefacts**

#### **A Symposium of the Commission on the History of Modern Chemistry (CHMC) [1] in Conjunction with the IUPAC-UNESCO International Year of Chemistry, 2011**

We invite all those interested in the heritage of chemistry in the twentieth and twenty-first centuries, including historians, chemists, archivists, museum curators, librarians, and industrial archaeologists, to join us in Paris on 21-24 June 2011 for a symposium involving conversations among experts from many different perspectives. Our intention is to present not only the views of historians on how best to use the sources, sites and artefacts of chemistry in the contemporary era, but also the views of those concerned with the technical problems related to the preservation and presentation to historians and the general public of those sources, sites, and artefacts.

The goal of the proposed symposium, to be held in Paris in the centenary year of the Nobel Prize for Chemistry awarded to Marie Curie, is to bring together a wide range of experts to discuss the challenges associated with

understanding, preserving, and presenting the heritage of chemistry in the twenty-first century. We have entered an era in which new scientific ideas and new technologies have changed not only the face of chemistry itself – which has become a highly diversified discipline and profession – but also the nature of the sources for its future history. Along with the paper documents, oral histories, instruments, and other artefacts that have previously embodied the heritage of chemistry we now need to include sources and artefacts that represent the chemistry of the present and future, including electronic documents, images, videos, databases, software, and the hardware needed to preserve and use these sources. How can the new technologies be best applied to preserve and enhance the use of older sources and artefacts as well as the new ones? How will historians need to adapt their methods of research to utilize these new technologies and sources, and how will the resulting changes affect the process of writing and publishing results, including electronic publications? How can archivists, librarians and museum curators best obtain, preserve, and ensure their future accessibility to interested specialists? Besides the preservation and use of these materials, historians must also be increasingly concerned with the preservation of key sites associated with the heritage of chemistry, including academic and industrial research laboratories as well as centres of technological innovation, because the historical development of scientific and technological innovations may often be most clearly understood by seeing the original apparatus and equipment in their original settings. This raises the further question: how can the specialists and institutions concerned with the heritage of modern chemistry, including industrial archaeologists, best present critical sources, sites and artefacts to the general public, in ways that will highlight key developments and avoid misconceptions? In view of the rapid development of current technologies and the many challenges that they present, the organizers wish to engage specialists from different national, professional and institutional backgrounds in conversations that may help to produce constructive and ongoing interactions among all concerned.

We will therefore welcome the participation of a broad range of experts concerned with the heritage of chemistry. These should include historians of science and technology; curators, industrial archaeologists, and directors of public and private museums and cultural sites as well as directors and staff of libraries and archives of all kinds, including those in industrial settings; experts in electronic media concerned with the heritage of chemistry; and of course chemists in all types of institutions. Ultimately we hope to promote a better understanding of how best to deal with the current and future challenges for shaping the heritage of chemistry in a new era.

Deadlines: The deadline for submissions has passed on 15 January 2011. The programme committee will review all submissions by 15 February 2011.

By 20 February submitters will receive notification by email as to the committee's decisions.

**Symposium costs:** Registration fees: 200 Euros (including a reception on the evening of 21 June, and lunches on 22 and 23 June). **The conference dinner** on the evening of Thursday, 23 June, will be paid for separately (cost to be determined).

Further information and particulars about registration and methods of payment will be available shortly on the symposium website at [www.chmc2011.fr](http://www.chmc2011.fr)

**For enquiries contact:** Jeffrey A. Johnson (incoming president, CHMC; Villanova University, USA): [Jeffrey.Johnson@villanova.edu](mailto:Jeffrey.Johnson@villanova.edu)

#### **British Society for the History of Science: Annual Conference, 2011**

The BSHS Annual Conference will take place at the University of Exeter from 14-17 July 2011. The conference will start with a buffet lunch on 14 July, followed by a plenary lecture. The main venue is the Queen's Building, located on the main campus of the University of Exeter, a former private botanical garden and arboretum. The conference dinner will be held in Holland Hall, overlooking the Exe valley.

The programme will include parallel themed sessions, plenary lectures, education and outreach activities, and an opportunity to explore the resources available in Exeter for historians of STM. An inclusive conference package will be available. Besides the attractions of Exeter, especially its twelfth-century Norman cathedral, the city itself is an ideal base for extending your stay and exploring the spectacular coastlines and moors of Devon and Cornwall, with their many geological and archaeological remains. Participation is in no way limited to members of the BSHS although members will receive a discount on the registration fee.

The deadline for submitting proposals has already passed on 21 January 2011.

Enquiries concerning the academic programme should be directed to [bshs2011programme@bshs.org.uk](mailto:bshs2011programme@bshs.org.uk)

Those relating to the local arrangements should be directed to [bshsExeter2011@bshs.org.uk](mailto:bshsExeter2011@bshs.org.uk)

Please also see the conference website

<http://www.bshs.org.uk/conferences/annual-conference/2011-exeter>

Lucy Tetlow  
BSHS Executive Secretary

#### **ADVANCED NOTICE**

##### **Joint meeting with Dyes in History and Archaeology, Derby.**

This will be held at the University of Derby, Thursday and Friday 13-14 October 2011, with social events on the Wednesday evening and all day Saturday 15 October; and the conference banquet on Thursday evening. Details, including costs, will follow in our late summer *Newsletter*.