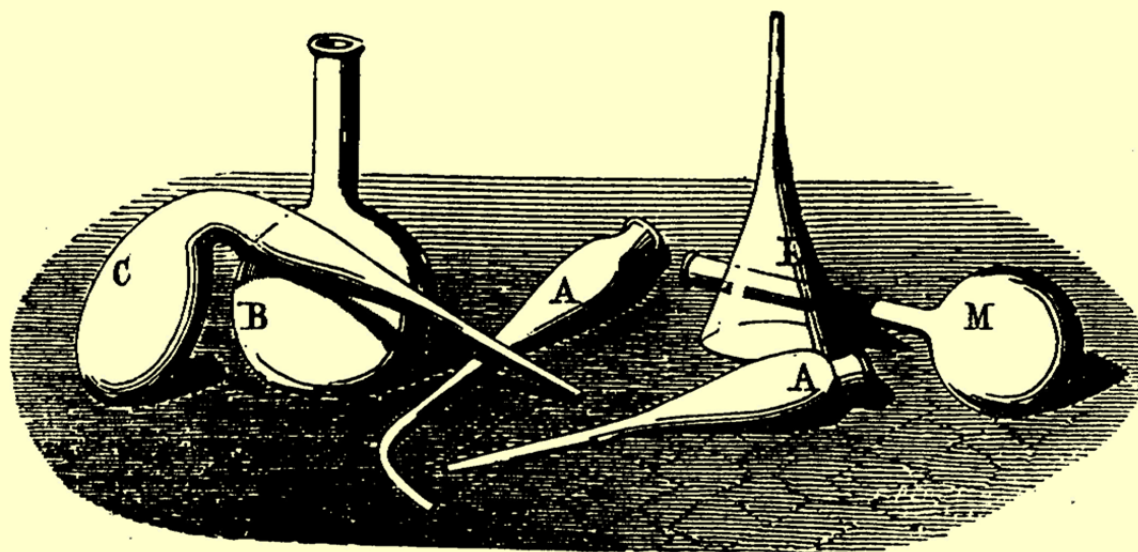




ACS
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American Chemical Society
**DIVISION OF THE
HISTORY OF CHEMISTRY**



NEWSLETTER, PROGRAM & ABSTRACTS

249th ACS National Meeting
Denver, CO
March 22-26, 2015

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Mission Statement

The Division of the History of Chemistry ([HIST](http://www.scs.uiuc.edu/~mainzv/HIST/) - <http://www.scs.uiuc.edu/~mainzv/HIST/>) of the American Chemical Society (ACS) seeks to advance knowledge and appreciation of the history of the chemical sciences among chemists, students, historians of science, and the broader public by

- Encouraging research and scholarship in history of the chemical sciences;
- Providing a welcoming environment for the discussion of history of chemistry in a variety of venues, particularly in symposia at national ACS meetings;
- Serving as a resource for chemical scientists in general, and members of the ACS in particular, who seek to understand the roots of their discipline, sub-discipline, or interdisciplinary subject;
- Recognizing major achievements from the past in the chemical sciences and the individuals who made those achievements;
- Publishing a scholarly journal in history of chemistry;
- Interacting with other organizations interested in the history of science; and
- Adding value to the ACS by helping it achieve its vision and missions.

Division Governance

Message from the HIST Division Chair

This promises to be an interesting year for HIST. We are blessed by many new members, often due to the generosity of Mary Virginia Orna and her author team for *The Lost Elements*. I would encourage all of you to experience the joy of attending HIST sessions at National Meetings like Denver and Boston.

While HIST is one of the smaller Divisions of the ACS, it occupies a place at the center of the mission and vision of Chemistry. Every other Division has a history! One of the goals for 2015 is to increase the visibility of HIST within ACS. I am meeting with Chairs of many other Divisions this year.

While HIST is a Division of the ACS, it is quite visible within the worldwide community of historians of Chemistry. One of my goals for 2015 is to continue the active networking with organizations such as the History of Science Society, The Society for the History of Alchemy and Chemistry, The European Working Group in the History of Chemistry, The Chemical Heritage Foundation, etc. The year concludes with the Pacificchem Meeting in Hawaii (my home). Representatives from many Pacific Rim countries will present the history of chemistry in their countries as a HIST symposium. Thanks are in order for the great work of Seth Rasmussen in promoting this event.

One of the joys of being Chair is working with the HIST Executive Committee. First, thanks and praise are due to Ned Heindel for his patient and careful guidance for the last two years. We welcome Ron Brashear from the Chemical Heritage Foundation as the new Chair-elect and Daniel Rabinowitz as a new member of the Executive Committee. The “soul” of the Division continues to be our Secretary/Treasurer, Vera Mainz.

The scholarly publication of HIST is the *Bulletin for the History of Chemistry*. It has a long history and is now well-recognized in the worldwide community. I encourage you to read it, to absorb it, and to submit your best work to it. With the outstanding community of historians currently at work, the *Bulletin* can only get better. Thanks to Carmen Giunta and his team.

HIST is a welcoming community of “cranks” who love the history of chemistry. There are many opportunities to serve within this group. Please get to know the leaders and other members of HIST. They will make your day!

Gary Patterson, HIST Chair



Report of Councilors, Division of the History of Chemistry

248th ACS National Meeting – San Francisco, CA; August 13, 2014

Election Results

The Committee on Nominations and Elections presented to the Council the following slate of candidates for membership on the **Committee on Committees** beginning in 2015: Spiro D. Alexandratos, Mark A. Benvenuto, Mitchell R.M. Bruce, Judith N. Currano, Jetty L. Duffy-Matzner, Kath-leen Gibboney, Helen A. (Bonnie) Lawlor, Zaida Morales-Martinez, Robert A. Pribush, and Patricia A. Redden. By electronic ballot, the Council elected **Mitchell R.M. Bruce, Judith N. Currano, Helen A. (Bonnie) Lawlor, Zaida Morales-Martinez, and Robert A. Pribush** for the 2015-2017 term.

The Committee on Nominations and Elections presented to the Council the following slate of candidates for membership on the **Council Policy Committee** beginning in 2015: Lawrence Barton, Dwight W. Chasar, Lynne P. Greenblatt, Martha G. Hollomon, Peter C. Jurs, Pamela D. Kistler, Doris I. Lewis, Christopher Masi, Andrea Twiss-Brooks, and Linette M. Watkins. By electronic ballot, the Council elected **Lawrence Barton, Lynne P. Greenblatt, Peter C. Jurs, and Linette M. Watkins**, for the 2015-2017 term, and **Andrea Twiss-Brooks** for the remainder of a 2014-2016 term.

The Council Policy Committee presented to the Council the following slate of candidates for membership on the **Committee on Nominations and Elections** beginning in 2015: Anthony W. Addison, John W. Finley, Lydia E.M. Hines, Roland F. Hirsch, Robert L. Lichter, Mamie W. Moy, Anne T. O'Brien, Eleanor D. Siebert, Herbert B. Silber, and Ralph A. Wheeler. By electronic ballot, the Council elected **Lydia E.M. Hines, Robert L. Lichter, Mamie W. Moy, Anne T. O'Brien, and Eleanor D. Siebert** for the 2015-2017 term.

Reports of Elected Committees

Nominations and Elections (N&E)

N&E announced the candidates for the fall 2014 ACS national election as follows:

Candidates for President-Elect, 2015

- Peter K. Dorhout, Dean of Arts & Sciences and Professor of Chemistry, Kansas State University, Manhattan, KS

- William A. Lester, Jr., Professor of the Graduate School, Department of Chemistry, University of California, Berkeley, CA
- Donna J. Nelson, Professor, Department of Chemistry and Biochemistry, University of Oklahoma, Norman, OK

Candidates for Directors-at-Large, 2015-2017

- Dawn A. Brooks, Sr. Director, Lilly Research Laboratories, Eli Lilly and Company, Indianapolis, IN
- William F. Carroll, Jr., Vice-President, Occidental Chemical Corporation, Dallas, TX
- Barbara A. Sawrey, Associate Vice Chancellor, Academic Affairs, and Dean of Undergraduate Education, University of California, San Diego, La Jolla, CA
- Ellen B. Stechel, Deputy Director, ASU-LightWorks, Tempe, AZ, Arizona State University

Candidates for District III Director, 2015-2017

- Pat N. Confalone, Confalone Consulting, LLC, (Retired DuPont), Wilmington, DE
- Anne S. DeMasi, Hazard Communication Manager, Chemtura Corporation, Philadelphia, PA

Candidates for District VI Director, 2015-2017

- Paul W. Jagodzinski, Dean, College of Engineering, Forestry & Natural Sciences, Northern Arizona University, Flagstaff, AZ
- Lee H. Latimer, Consultant, Oakland, CA

Committees (ConC)

On the recommendation of ConC, Council **VOTED** to continue the Committee on Patents and Related Matters, subject to concurrence by the Board of Directors; and to continue the Committee on Technician Affairs.

Council Policy (CPC)

CPC announced that the recommendations of its Task Force to Review the Councilor Reimbursement Policy, approved in March 2014, were forwarded to the Society Committee on Budget and Finance and ultimately will go to the Board for action.

At the spring meeting in 2015, CPC will set the divisor for 2016-2019. The formula will be based on membership numbers as of December 31, 2014. Official notification of the Councilor divisor and the number of Councilors permitted for Local Sections or Divisions will be sent to Local Sections and Divisions no later than May 1, 2015, as it will affect elections conducted in 2015. CPC will form a small task force on Councilor Divisor Communications to assist staff.

Reports of Society Committees and Committee on Science (Highlights)

Budget and Finance (B&F)

B&F reviewed the Society's 2014 probable year-end financial projection which calls for a Net Contribution from operations of \$14.4 million, or \$752,000 higher than the Approved Budget. Total revenues are projected at \$497.2 million. This is \$1.1 million or 0.2% unfavorable to the Approved Budget. The projected shortfall is primarily driven by lower-than-budgeted Electronic Services, Registration Fees, and Advertising revenues. Total expenses are projected at \$482.8 million, which is \$1.9 million or 0.4% favorable to the Approved Budget. This variance is the result of lower-than-budgeted expenses across multiple categories primarily in the Society's information services divisions (CAS and Publications). The Probable 1 projection was developed using May 31 actual financial results. Based on more recent information through July, management believes this projection will be exceeded.

Education (SOCED)

SOCED received an update on the new American Association of Chemistry Teachers (AACT), which is now accepting members and will officially launch September 2, 2014. AACT member benefits include access to curricular resources, such as lesson plans and multimedia; professional development opportunities; a subscription to ChemMatters; and an online member network. SOCED voted to approve revisions to the current policy statements on hands-on laboratory science, science and technology funding, and visa restrictions. The statements will go to the Board of Directors for approval at its December meeting.

Science (ComSci)

ComSci remains focused on three areas: increasing understanding of the emerging frontiers in science, recommending eminent chemical scientists for prestigious external awards, and developing public policies to advance science in society. ComSci has identified two multidisciplinary areas that hold great promise for fostering innovation and opportunities for chemistry-related scientists: advanced materials and the chemistry of clean and renewable energy. ComSci has also completed four on-demand video interviews with Nobel Laureates and other celebrated scientists, which will be linked with the onsite emerging science forums in 2015.

Reports of Standing Committees (Highlights)

Economic and Professional Affairs (CEPA)

CEPA announced that the unemployment rate for all ACS chemists has dropped from 3.5% in March 2013 to 2.9% as of March 2014. However, the unemployment rate for new chemistry graduates as of August 2013 is considered to be an all-time high of 14.6%. The number is higher when we isolate bachelor's level graduates, for whom the rate is 15.8%.

On the recommendation of CEPA, Council **VOTED** to approve the Professional Employment Guidelines.

Committee on Meetings and Expositions (M&E)

M&E reported that 11,847 papers were accepted for the 248th National Meeting in San Francisco. As of August 13, total attendance was 15,761. The Exposition had 432 booths with 285 exhibiting companies. The Committee voted to recommend to the Board of Directors the following sites for National Meetings:

- Boston – Fall 2024, 2029, 2031
- San Diego – Spring 2025, 2031, and Fall 2027
- New Orleans – Spring 2027, 2032
- Chicago – Fall 2022

The Committee heard an update on the Meeting Abstracts Programming System (MAPS). The new system will launch August 25 in preparation for the Denver National Meeting. Regional Meetings and specialty conferences will use MAPS starting in January 2015.

M&E has voted to strengthen the current recording policy at National Meetings by including enforcement language. Failure to follow the policy could result in disciplinary action up to and including expulsion from the meeting.

Divisional Activities (DAC)

DAC is conducting a pilot program with the ACS Presentations on Demand Coordinating Editor regarding a new type of recorded meeting content – three to five-minute videos (ACS POD Shorts) that focus on the most notable aspects of a full-length presentation. DAC voted to fund eight Innovative Project Grants, totaling \$33,750. DAC is also developing a process to more readily permit divisions to benefit from one another's innovations.

The Multidisciplinary Program Planning Group is proposing the following 2018-2019 national meeting themes to the divisions for their consideration:

2018

Spring – Energy Solutions and the Environment
Fall – Chemistry – from Bench to Market

2019

Spring – Chemistry for New Frontiers

Committee on Local Section Activities (LSAC)

LSAC will award 14 Innovative Project Grants (IPG) totaling \$30,033, bringing the 2014 total to 33 IPG awards totaling over \$70,000. LSAC will also be offering grants during the fall to assist local sections with hosting a strategic planning retreat; a Leadership Development System course in their section, and to assist with travel to the 2015 ACS Leadership Institute. National Chemistry Week will be held October 19-25 with the theme, "The Sweet Side of Chemistry: Candy".

On the recommendation of LSAC, the Council **VOTED** to dissolve the Ocean County Local Section due to inactivity.

Membership Affairs (MAC)

MAC reported that as of June 30, the total ACS membership was 158,869, a net increase of 512 since May of this year. The number of international members has grown this year by 312, to almost 25,000. The number of current, unpaid members declined in June and is 13% lower than June 2013. As of July 1, automatic renewal (on credit card) became available. The Committee also

voted to extend its current test of an introductory membership offer to those who join the Society at non-ACS conferences and events to include the graduate students and potential Regular Members who attend ACS on Campus events worldwide each year.

Constitution and Bylaws (C&B)

C&B certified bylaws for 10 local sections, one division, and two International Chemical Sciences Chapters since January 1, 2014. C&B has been modified the model bylaws for local sections, divisions, and International Chemical Sciences Chapters. The Committees on Local Section Activities, Divisional Activities, and International Activities, respectively, will be asked to review the changes and approve them no later than their Denver (2015) meetings.

Reports of Other Committees (Highlights)

Chemistry and Public Affairs (CCPA)

To celebrate four decades of ACS public policy fellowships, more than 20 former fellows gathered in San Francisco, six of whom spoke about their experiences at a symposium sponsored by CCPA and the Division of Professional Relations. The deadline to apply for the 2015-2016 fellowships is December 31, 2014. More information can be found at www.acs.org/policyfellow.

Environmental Improvement (CEI)

CEI reported on the outstanding programming that was offered at the San Francisco meeting relating to Chemistry and Global Stewardship. The Committee also assisted the Division of Environmental Chemistry in the observance of their centennial. CEI continues to review existing policy statements to keep them fresh and relevant and to explore emerging areas of interest where ACS can offer the expertise of its members.

Ethics (ETHX)

Through its subcommittees, ETHX has strengthened its relationship with the National Center for Professional & Research Ethics, which is tied to the Education and Materials Subcommittee action plan to develop resource materials, and is committed to producing a twice-yearly newsletter to showcase current Ethics Committee endeavors. It is seeking

to co-sponsor or help embed ethics related content and/or dialog into presentations and symposia.

International Activities (IAC)

At the San Francisco meeting, IAC organized or sponsored seven symposia, convened four soft-skills training sessions for Brazilian young scholars studying in the U.S.A., conducted an experimental networking event for Chinese chemists and allied practitioners, and initiated a ‘soft launch’ of the ACS International Chemical Sciences Chapter in South Korea.

On the recommendation of IAC, Council **VOTED** to approve the establishment of an International Chemical Sciences Chapter in South Africa. This action requires Board action, too.

Professional Training (CPT)

At this meeting, CPT evaluated 42 periodic reports from currently approved programs, two from programs on probationary status, and one site visit report from a school applying for ACS approval. Four new programs were approved, and one institution was removed from the approved list. The Committee concluded discussion of the guidelines revision and voted provisional approval of the draft document. The draft will be distributed to department chairs of chemistry programs this fall. CPT also approved the final report of a survey on chemical information resources that will be published in the Committee newsletter and website.

Project SEED

This year, the Committee awarded 28 Project SEED College Scholarships to 17 female and 11 male alumni from 16 states and Puerto Rico. The Committee also reviewed key issues that impact Project SEED: issues pertaining to project selection, college scholarship applications, and geographic distribution of the program. To address these impacts, the Committee proposed modifications to the current selection process for research projects, reviewed and approved changes to the Scholarship application, and established a Geographic Expansion Subcommittee. The Committee also established an Ethics Task Force and discussed the implementation of ethics guidelines for Project SEED students as a requirement for all programs.

Public Relations and Communications (CPRC)

The Chemistry Ambassadors observes its fifth anniversary. There are currently more than 10,000 Ambassadors. At this meeting, CPRC launched “ChemChamps,” an outreach effort still in the pilot stage, as part of the Ambassadors program. Five of our younger members each gave a 3-minute explanation of their research in a way that would engage non-scientists. It appears to be a great follow up to the encouragement given by Alan Alda at an open Board meeting last year to go forth and make chemistry relevant to the public. CPRC now has new mission statement: “CPRC supports the ACS goal of improving public understanding and appreciation of chemistry’s contributions to people’s lives.”

Senior Chemists (SCC)

SCC has approved 22 mini-grants of \$300 each to encourage and support the organization of senior groups at the local section level. The SCC newsletter now has the highest “open” rate of all newsletters published by the Society. The Committee co-organized a very successful day-long symposium, “Innovation in International Collaboration,” with the Committee on International Activities and the Division of Professional Relations.

Technician Affairs (CTA)

CTA observed its 50th Anniversary at this meeting with a symposium, “The Role of the Chemical Technician Through the Decades,” cosponsored with the Division of Industrial and Engineering Chemistry and the Division of the History of Chemistry. CTA also presented three different awards: a Salute to Excellence at the ACS Diversity reception, two K. Michael Shea awards at the CTA anniversary dinner, and the first CTA Chemluminary to the Brazosport Local Section.

Women Chemists (WCC)

WCC sponsored two full-day symposia, “Mom, the Chemistry Professor,” and “Women Leaders of the Global Chemistry Enterprise.” The Committee recognized 10 WCC/Eli Lilly Travel awardees, and the 2014 Overcoming Challenges Award recipient.

The Committee recognized 10 WCC/Eli Lilly Travel Grant Recipients, and the 2014 Overcoming Challenges Award winner. The Committee also acknowledged the Puget Sound Local Section, recipient of the Chemluminary Award for

Outstanding Program Aimed at Retaining Women in the Chemical Sciences.

Younger Chemists (YCC)

YCC continues to identify new opportunities for leveraging their social media following (Twitter, Facebook, LinkedIn, and Vine). The Committee has developed partnerships with the ACS Office of Public Affairs to help promote the #Chem-Champs program and the highly successful joint effort “Program in a Box” with ACS Webinars. YCC has secured funding for two “Program in a Box” events for 2015. At this meeting, YCC sponsored the

Activities of HIST Councilors

Mary Virginia Orna – continues to serve as an Associate Member of the Local Sections Activities Committee (LSAC).

Roger Egolf – continues to serve as a member of the Division Activities Committee (DAC) and chairs the Constitution and Bylaws subcommittee of DAC.

Mary Virginia Orna, Roger A. Egolf, Councilors

symposium “Advances in Small Molecule Approaches to HIV.”

Resolutions

The Council passed several resolutions, including one commending Executive Director and CEO Madeleine Jacobs on the occasion of her upcoming retirement.

M&E reported that a total of 15,761 persons attended the San Francisco meeting.

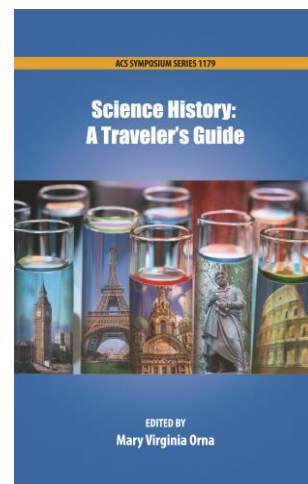
News

Science History: A Traveler's Guide

The most recent HIST-sponsored volume of the ACS Symposium Series, *Science History: A Traveler's Guide*, is now currently available. The ACS Symposium Series, which publishes peer-reviewed books developed from the symposia of the various ACS technical divisions, has become a popular venue for the dissemination of historical work presented as part of the HIST programming at ACS National Meetings. Published as ACS Symposium Series Volume 1179, the ebook version of this volume was released in November 2014, with the hardback version to be released sometime in early 2015.

The volume is based on the *Science History Study Tours: Global Perspectives* symposium originally held at the Spring 2009 ACS Meeting in Salt Lake City. Edited by Mary Virginia Orna, the volume includes chapters by a number of the original speakers, including Mary Virginia Orna, David A. Katz, Zvi C. Koren, and Carmen J. Giunta. A number of additional authors from across the globe have then been added to supplement the original speakers, resulting in a total of 16 chapters

and a broad range of cover-ed locations. A full list of the available chapters and the corresponding details can be found at

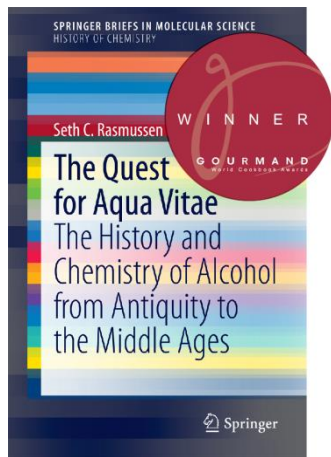


<http://pubs.acs.org/isbn/9780841230200>.

Gourmand Award Recognizes Volume in Springer Briefs in History of Chemistry Series

The Quest for Aqua Vitae, written by Seth C. Rasmussen of North Dakota State University, was selected for a Gourmand Award as the Best Drink

History Book published in Germany during 2014. Published by Springer, this volume is one of the latest entries in the *Springer Briefs in Molecular Science: History of Chemistry* book series. The series was founded in 2011 by Rasmussen (HIST Program Chair) and a number of notable

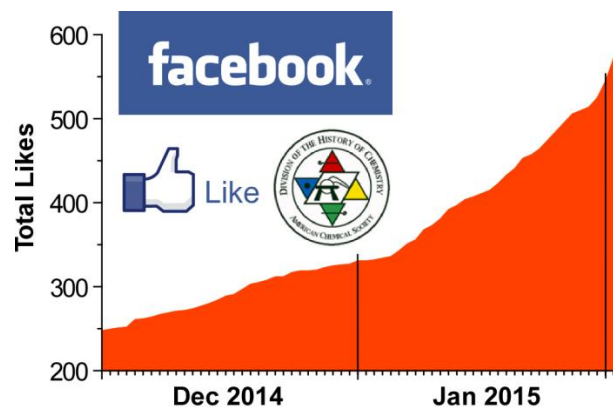


HIST members have contributed volumes to the series. The volume recognized by the award documents the history and chemistry of alcohol from the origins of fermented beverages in pre-history (mead, beer, wine) up through the Middle Ages, when alcohol was first isolated by the distillation of wine. In addition, early chemical and medical applications of alcohol are also discussed.

The Gourmand Awards were founded in 1995 to initially recognize the best cookbooks published in the world. Over time, however, these awards have expanded to include a variety of book categories covering all aspects of food and drink. Books are first awarded according to country of publication, before the final selection of the Gourmand *Best in the World* Award in each category. As the winner for Germany, *The Quest for Aqua Vitae* will go on to compete against 11 other books for the top Drink History Book of 2014. The final selection will be announced in June, 2015.

HIST Popularity Rises Dramatically on Facebook

The community following the HIST Facebook page has more than doubled in the last two months, from just under 250 likes at the beginning of December 2014 to nearly **600 likes** by the end of January 2015 (see plot to the right). As in the past, the majority of those reached via Facebook are still younger people (70% are aged 18-35), with roughly half residing in Egypt, the US, and India. All told, 83% of our followers are from various international communities (45 different countries!) without traditional access to activities of the division.



The HIST Facebook page can be found at <https://www.facebook.com/pages/ACS-Division-of-the-History-of-Chemistry-HIST/152326921497559> or by searching 'HIST' in the Facebook search bar. If you are a Facebook user, please stop by and check out these efforts to share our passion of the subject with the world. Then 'Like' the page to join us and post comments to share the history of chemistry with our growing audience!

HIST-sponsored PACIFICHEM 2015 Symposium Now Accepting Abstracts

The HIST-sponsored symposium for the 2015 International Chemical Congress of Pacific Basin Societies (Pacifichem 2015) is entitled *Historical Evolution of*



the Chemical Community in the Countries of the Pacific Rim and is organized by HIST officers Seth Rasmussen and Gary Patterson, along with co-organizers Trevor Levere (Canada), Yasu Furukawa (Japan), and Ian David Rae (Australia). The symposium currently has 10 confirmed invited speakers and contributed talks from additional speakers are welcome. Anyone interested in potentially participating in the symposium should contact Seth Rasmussen (seth.rasmussen@ndsu.edu) or Gary Patterson (gp9a@andrew.cmu.edu) for further information.

Pacifichem 2015 will take place in Honolulu, Hawaii, USA, December 15-20, 2015 and additional conference information can be found at <http://www.pacifichem.org>. **The deadline for all abstracts is April 3, 2015.**

10th International Conference on the History of Chemistry

This interdisciplinary conference will be held at the University of Aveiro, Portugal, September 9-12, 2015, with the topic Chemical Biography in the 21st Century (<http://10ichc-2015.web.ua.pt/>). The conference welcomes participants from a range of academic disciplines including history of science and technology, science and technology studies (STS), economic and business history, and the history of material culture and museum studies. We also warmly welcome participants from chemistry and related disciplines with an interest in the history of their discipline.

Biographies—whether in the form of books or articles—have always been an important genre in the history of chemistry. General histories of chemistry have often taken a biographical approach, most notably the four volume work of J. R. Partington. Many chemists, especially in the German-speaking world, have written autobiographies which along with the formal obituaries produced by national academies of science have formed an important source of information for historians of chemistry. More recently the American Chemical Society published the “Profiles, Pathways and Dreams” series which extended the autobiographical form up to the end of the 20th century. For several decades in the latter half of the 20th century, professional historians of chemistry avoided the biographical approach as being inherently too hagiographical and “Whiggish”. However following the pioneering work of scholars in the history of physics the biography has been taken up anew as a framework for analyzing thematic problems and social-cultural questions. This conference will critically examine this conceptual “turn” in the historiography of chemistry and explore ways in which the biographical approach can be fruitfully employed by historians of chemistry.

The conference will embrace all aspects of the history of alchemy and chemistry including the history of materials and the history of biochemistry. Papers which simply present the biography of a chemist will not be accepted, as there must be a line of argument or a historical problematic. Papers might address:

1. Autobiographies as a source for historians of chemistry
2. Biography and discipline building

3. Biographies and nationalism
4. The making and unmaking of chemical heroes
5. Myths and misrepresentation
6. Iconography as a mode of self-representation in the visual arts, sculpture and photography
7. The historiography of the biographical mode
8. Collective biographies including biographical dictionaries and the “biographies” of research groups

Proposals for papers on other topics can be submitted, but preference will be given to papers reflecting the conference theme. Proposals can be made for sessions, standard papers (20 minutes), short papers (10 minutes) and posters. Proposals (abstracts) should be uploaded using EasyChair on the website <http://10ichc-2015.web.ua.pt/> and be a minimum of 150 words and a maximum of 300 words. The session proposals should also contain the abstracts of the proposed papers. **The deadline for all proposals is midnight (Universal Time/GMT) on 31 March 2015.** Further details of the conference, including local arrangements and accommodation, will be found on the website. Please address any queries to the chair of the program committee, Peter Morris, at peter.morris@sciencemuseum.ac.uk.

IUPAC Travel Fellowship

The International Union of Pure and Applied Chemistry (IUPAC) is holding its 48th General Assembly (August 6-13, 2015) and its 45th Congress (August 9-14, 2015) in Busan, South Korea.

The U.S. National Committee for IUPAC is seeking outstanding U.S. scientists and engineers under the age of 45, with interests and expertise related to the working groups of IUPAC, to travel as Young Observers to South Korea. The USNC/IUPAC will provide travel fellowships of \$2500 to successful candidates. This Young Observer Program provides an excellent opportunity to become involved in the work of IUPAC, develop an international network of scientists and engineers, and represent your U.S. colleagues in the chemical sciences. Successful candidates must:

- Be a U.S. scientist or engineer under the age of 45, be active in chemical or chemical engineering research in academia, government, or industry. Applicants must be a U.S. citizen or U.S. Permanent Resident (Green Card Holder).

- Have a specific interest in one or more of the business meetings and technical sessions that will be held in Korea.
- Have a strong interest in collaborative work with scientists in laboratories outside of the United States.
- Have an interest in continuing activities through the IUPAC organization.

Career scientist applicants should ideally have, but are not required to have, five years of independent

research/work experience after the completion of their educational experience. In exceptional cases applications from graduate students and postdoctoral researchers will be considered.

2015 Young Observer Program Application Deadline is February 23, 2015. For more information about the program and to apply, visit <http://ow.ly/GPPqI>. Questions about the program can be directed to BISO@nas.edu.

News from the Chemical Heritage Foundation

The [Chemical Heritage Foundation](#) (CHF) fosters an understanding of chemistry's impact on society. An independent nonprofit organization, we strive to inspire a passion for chemistry, highlight chemistry's role in meeting current social challenges, and preserve the story of chemistry across centuries. CHF maintains major collections of instruments, fine art, photographs, papers, and books. We host conferences and lectures, support research, offer fellowships, and produce educational materials. Our museum and public programs explore subjects ranging from alchemy to nanotechnology.

New Exhibit of Alchemical Art, Documents Opens in Philadelphia

A new exhibit of alchemical art and documents opened December 5 in the Museum at CHF. Books of Secrets: Writing and Reading Alchemy will feature newly acquired 15th-century alchemical manuscripts as well as rarely seen works of art from CHF's extensive alchemical art collection.

"For more than a decade, we have had world-class collections of alchemical books and paintings," said Carsten Reinhardt, president and CEO. "Our new collection of alchemical manuscripts adds a further dimension, making this an exciting new exhibit for experts and casual visitors alike."

Books were central to the alchemical enterprise. Alongside their labor in the lab, alchemists worked hard in the study reading, copying, and taking notes. This central role of the written word is reflected in visual depictions of alchemists. Alchemical paintings are full of books: alchemists reading, taking notes, even standing with nose in book while stirring the crucible.

The alchemical manuscripts CHF recently acquired provide the opportunity to highlight the role of the written word in alchemy. And the key to interpreting these artifacts will be supplied by works from CHF's fine art collection. These rarely seen paintings bridge the alchemist's intellectual and practical pursuits. Their scenes of alchemists

working in their laboratories surrounded by books will be juxtaposed with the beautiful hand-written manuscripts themselves.

Books of Secrets will illustrate the craftsmanship of these early written books, from the materials used to the symbols embedded, and will demonstrate their use in the workshop. The exhibit will conclude by revealing the transition from handwritten manuscripts to their early printed counterparts, emphasizing the persistence of individuality among the later editions. Books of Secrets will be open through September 2015.

Chemical Heritage Foundation Adds Four to Board of Directors

The Chemical Heritage Foundation (CHF) added four members to its board of directors earlier in 2014. Three of the new board members are chemists from universities in California and Pennsylvania. One is a historian of science at the University of Oxford, United Kingdom.

"It is with great pleasure that we welcome four new members of such high caliber," said Laurie Landeau, chair of the board. Joining the CHF Board of Directors:

- Peter B. Dervan, Bren Professor of Chemistry, California Institute of Technology, who is a representative of the American Chemical Society.
- Robert Fox, Emeritus Professor of the History of Science, University of Oxford

- Ned D. Heindel, H. S. Bunn Chair Professor of Chemistry, Lehigh University, who is a representative of the American Chemical Society.
- Gary D. Patterson, Professor, Department of Chemistry, Carnegie Mellon University, who chairs CHF's Heritage Council.

The board of directors is charged with fiduciary and policy oversight of CHF. Members have served in leadership roles in academe, industry, and historical institutions.

News from the Society for the History of Alchemy and Chemistry

Founded in 1935, the Society for the History of Alchemy and Chemistry (SHAC) has consistently maintained the highest standards of scholarship in all aspects of the history of alchemy and chemistry from early times to the present. The Society has a wide international membership of over 200 with members from 28 countries.

New Deputy Editor of *Ambix*

The Society for the History of Alchemy and Chemistry is delighted to announce that Alan Rocke, Henry Eldridge Bourne Professor of History and Distinguished University Professor at Case Western Reserve University, will be the next Deputy Editor of *Ambix*, starting from 1 January 2015. He succeeds Peter Morris, who has served two years as Deputy Editor following a previous eleven years as Editor of *Ambix*. The Society welcomes Alan, and thanks Peter for his outstanding service. Dr. Morris remains on the Editorial Advisory Board of *Ambix*.

Graduate Network

The SHAC Graduate Network aims to stimulate research into the history of alchemy and chemistry worldwide, by providing research training, grants and networking opportunities for postgraduate students and postdoctoral researchers working in these fields. As part of this scheme, postgraduates and early career researchers are eligible to apply for grants towards the

cost of research (the New Scholars Award). The Society also organizes an annual workshop for students and junior scholars, focusing on methods, sources and approaches in the history of alchemy and chemistry. The 5th annual workshop, 'Geographies of Alchemy and Chemistry', took place in Amsterdam on 24 October 2014. Next year, the workshop will likely be held in or near London. If you have suggestions for a suitably broad topic that is relevant to the history of alchemy as well as chemistry, do not hesitate to get in touch.

If you are a postgraduate student or junior researcher interested in the history of alchemy or chemistry, you are also invited to join our online Graduate Network group, which publicizes announcements and hosts discussions related to the fields. Should you wish to join, please send an email, mentioning your name, affiliation and brief interest, to: shac_graduate_network-subscribe@yahoogroups.co.uk. Please note that you do not need to be a member of SHAC to become part of the Graduate Network).

News from the History of Science Society

The History of Science Society is the world's largest society dedicated to understanding science, technology, medicine, and their interactions with society in historical context. It was founded in 1924 to foster interest in the history of science and its social and cultural relations.

Jürgen Renn Awarded the 2014 Francis Bacon Prize for Outstanding Scholarship in the History of Science

Jürgen Renn, Director at the Max Planck Institute for the History of Science in Berlin, has won the 2014 Francis Bacon Award for his influential studies of structural changes in systems of knowledge. In order to develop a theoretical understanding of knowledge evolution, he has published discussions and analyses

of the origins of theoretical science in antiquity, the emergence of classical mechanics in the early modern period and the revolutions of modern physics in the early twentieth century, including statistical mechanics, relativity, and the quantum.

He is a pioneer of open access in the humanities and has developed and contributed to major exhibitions on the history of science, such as "Albert Einstein—Chief Engineer of the Universe", "Max Planck

Revolutionary against his Will,” and “Archimedes: The Art and Science of Invention.”

Jürgen Renn is honorary professor for History of Science at Berlin’s Humboldt and Freie universities Berlin and a founding member of the Berliner Antike Kolleg. He is a member of many national and international editorial and scientific boards, including the German National Academy of Sciences (the Leopoldina). In 2014 he was awarded the Gustav Neuenschwander Prize of the European Society for the History of Science.

Francis Bacon Award Administered by the California Institute of Technology and the Francis

Bacon Foundation, the \$20,000 biennial award recognizes first-rate scholarship in the history of science and technology and historically engaged philosophy of science. As part of the award, Renn will spend a semester at Caltech as the Francis Bacon Visiting Professor in the Division of Humanities and Social Sciences, interacting with students and faculty. He will also give the inaugural lecture at a conference that will bring together outstanding physicists and historians to celebrate the first century of general relativity.

BULLETIN FOR THE HISTORY OF CHEMISTRY

A publication of the Division of the History of Chemistry of the American Chemical Society

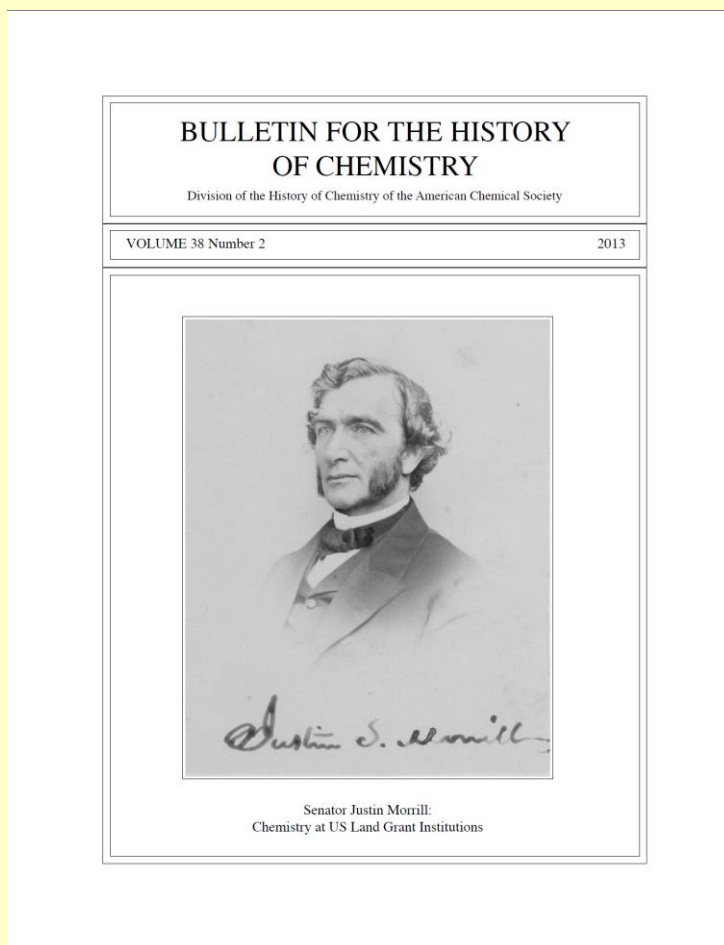
Available online: <http://www.scs.illinois.edu/~mainzv/HIST/bulletin/index.php>

PAPER SUBMISSIONS: Articles of 4-20 pages, double-spaced (excluding references) should be submitted electronically by email attachment to the Editor, Carmen Giunta, at giunta@lemoyne.edu. The title of the article should be of reasonable length (up to 15 words); a subtitle may be included if appropriate. Authors should strive to make the title descriptive of the specific scope and content of the paper. Preferred file formats for submissions are .doc, .docx, and .rtf.

Full instructions for authors can be found at <http://www.scs.illinois.edu/~mainzv/HIST/info/bull-info.php> or in the back cover of all issues of the *Bulletin*.

All matters relating to manuscripts, book reviews, and letters should be sent to:

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1419 Salt Springs Rd.
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HIST Programming

Message from the HIST Program Chair

In case you hadn't noticed, the HIST Newsletter has gotten a complete new makeover! As the Newsletter is now reaching far beyond the HIST membership (via the HIST webpage and the HIST Facebook page), I thought it was time to migrate to more glossy and professional look. In the process, some of the traditional components have been rearranged in an effort to produce dedicated sections of related content. If you have opinions, or suggestions for further improvements, you know how to reach me.

In terms of programming, we have two outstanding full-day symposia on tap for Denver, with my own *Chemical Technology in Antiquity* symposium on Monday and Joe Gal's *Modern Chemical Warfare* symposium on Tuesday. In addition, Margaret E. Schott will kick off our General Papers session with what looks to be another very interesting HIST tutorial topic that aptly ties into thematic programming. Her presentation Sunday at 1 PM is entitled *HIST Tutorial: Elemental sulfur – a natural (and unnatural) resource*.

In related news, Denver is the first meeting to fully use the new MAPS (Meeting Abstracts Programming System) for abstracts and programming. Hopefully, those submitting abstracts for both Denver and Boston have noticed a more user-friendly interface in comparison to the previous PACS interface. There are still a few bugs to work out in terms of operations from the Program Chairs side of things, but hopefully this move will be an overall positive one for everyone. If you are experiencing any issues with MAPS, please let me know so that I can pass that knowledge up the food chain and we can continue to work on removing barriers to members presenting their research at national meetings.

As always, if you have programming ideas or would like to provide suggestions or feedback, please don't hesitate to let me know (seth.rasmussen@ndsu.edu).

Seth C. Rasmussen, HIST Program Chair



HIST SYMPOSIA, 249th ACS Meeting in Denver, CO, March 22-26, 2015

Schedules and abstracts are listed at the end of this Newsletter.

Chemical Technology in Antiquity

Cosponsored by MPPG, ANYL, CHED, INOR, ORGN

Chemistry is intimately involved in the development of the oldest known civilizations, resulting in a range of chemical technologies that are not only still part of modern civilized societies, but are so commonplace that it would be hard to imagine life without them. Such chemical technology has a very long and rich history, in some cases dating back to as early as 20,000 BCE. This symposium aims to present the discovery, development, and early history of a range of such chemical technologies and is expected to be of significant interest to those curious about the development of some of mankind's earliest and most common technologies. Topics to be presented include not only the most significant and well-researched subjects (pigments, dyes, pottery, fermented beverages, metals and alloys, glass), but also a number of smaller subjects often ignored in the presentation of early chemical technology (leather and tanning, oils and perfumes, soap). The symposium will be held **Monday morning** and **afternoon**, March 23, at the Sheraton Denver Downtown - Tower Court D.

S. C. Rasmussen, Organizer

Modern Chemical Warfare: History, Chemistry, Toxicology, Morality

Modern chemical warfare began during WW I. A variety of substances ranging from tear gas to deadly poisons were used as chemical weapons in the war, killing ca. 91,000 and injuring ca. 1.2 million, with many of the latter condemned to a lifetime of suffering from physical or mental wounds. Both sides used chemical weapons in the war and many eminent chemists and other scientists participated in their development. And yet, some scientists refused, on moral grounds. This symposium will cover aspects of the history, the chemistry, the scientists, the clinical effects of the chemical weapons, and the ethics and morality of chemical warfare, including a presentation by the Organization for the Prohibition of Chemical Weapons (OPCW), winner of the 2013 Nobel Peace Prize. The symposium will be held **Tuesday morning and afternoon**, March 24, at the Sheraton Denver Downtown - Tower Court D.

J. Gal, Organizer

UPCOMING NATIONAL MEETINGS AND HIST DEADLINES

Offerings are subject to change. Check the HIST website (<http://www.scs.illinois.edu/~mainzv/HIST/>) for updates.

250th ACS Meeting, Boston, August 16-20, 2015

Submit your abstract via the new online Meeting Abstracts Programming System (MAPS) by **March 30th, 2014**. If you do not have access to a computer for use in the submission or are having difficulties in submitting your abstract, contact Seth Rasmussen (seth.rasmussen@ndsu.edu). Check the call for papers in *Chemical and Engineering News* or www.acs.org for changes in the abstract deadlines.

HIST Tutorial and General Papers. (**Seeking contributors**) Seth C. Rasmussen, Department of Chemistry and Biochemistry, North Dakota State University, NDSU Dept. 2735, P.O. Box 6050, Fargo, ND 58108-6050, Phone: (701) 231-8747, email: seth.rasmussen@ndsu.edu

Science and Legacy of Henry Hill. (Invited and **Seeking contributors**) Jan Hayes, Hayes, 6829 Barbara Lee Circle, Sacramento, CA 95842, Phone: (916) 331-6886, email: janan.hayes@yahoo.com

Fifty years of Innovation: The Legacy of the Westheimer Report. (Invited) Roger A. Egolf, Pennsylvania State University -Lehigh Valley Campus, 8380 Mohr Lane, Fogelsville, PA 18051-9999, Phone: (610) 285-5110, email: rae4@psu.edu

Edwin Land and Instant Photography: Massachusetts' First National Historic Chemical Landmark. (Invited) Vivian Walworth, StereoJet, Inc., 57 Smith Place, Cambridge, MA 02138, Phone: (978) 369-3735, email: vwalworth@comcast.net; Jack Driscoll, PID Analyzers, LLC, 2 Washington Circle, #4, Sandwich, MA 02563, Phone: (617) 680-2016, email: pidguy@aol.com

251st ACS Meeting, San Diego, March 13-17, 2016

HIST Tutorial and General Papers. (**Seeking contributors**) Seth C. Rasmussen, Department of Chemistry and Biochemistry, North Dakota State University, NDSU Dept. 2735, P.O. Box 6050, Fargo, ND 58108-6050, Phone: (701) 231-8747, email: seth.rasmussen@ndsu.edu

The Posthumous Nobel Prize in Chemistry. Correcting the Errors and Oversights of the Nobel Prize Committee. (Invited and **Seeking contributors**) E. Thomas Strom, Department of Chemistry and Biochemistry, University of Texas at Arlington, P. O. Box 19065, Arlington, TX 76019-0065, Phone: (817) 272-5441, Email: tomstrom@juno.com

Preceptors of Chemistry. (Invited and **Seeking contributors**) Gary D. Patterson, Department of Chemistry, Carnegie Mellon University, 4400 Fifth Avenue, Pittsburgh, PA 15213, Phone: 412-268-3324, Email: gp9a@andrew.cmu.edu

Final Program

HIST

DIVISION OF THE HISTORY OF CHEMISTRY

S. C. Rasmussen, *Program Chair*

SUNDAY AFTERNOON

Section A

Sheraton Denver Downtown - Tower Court D

HIST Tutorial and General Papers

S. C. Rasmussen, *Organizer, Presiding*

1:00 1. HIST Tutorial: Elemental sulfur – a natural (and unnatural) resource. **Margaret E. Schott**

1:40 2. James Hyatt, chemist, scientist, and communicator: A man of his times. **William P. Palmer**

2:10 3. Inaccuracy of dates in accounts of the history of chemistry: A case of deliberate falsification?
Joseph Gal

2:40 Intermission.

2:55 4. Rules, formulas, names: The lexical legacy of the 1892 Geneva Nomenclature Congress. **Evan Hepler-Smith**

3:25 5. NMR characterization of resin blocks from 13th century Java Sea Wreck. **Joseph B. Lambert,**
Allison Levy

3:55 6. Investigation into the first isolation of carbonic acid. **Reggie L. Hudson**

4:25 7. Foundation and influence of the Sydney School of Coordination Chemistry. **Anthony T. Baker**

SUNDAY EVENING

Sheraton Denver Downtown - Director's Row F

5:00 - 8:00 HIST Executive Committee Meeting

MONDAY MORNING

Section A

Sheraton Denver Downtown - Tower Court D

Chemical Technology in Antiquity

Cosponsored by MPPG, ANYL, CHED, INOR, ORGN

S. C. Rasmussen, *Organizer*

C. L. Heth, *Presiding*

8:25 Introductory Remarks.

8:30 8. Pigments in antiquity: Colorful forerunners of every aspect of modern chemistry. **Mary Virginia Orna**

9:15 9. First artificial material: Ceramics from prehistory to the fall of Rome. **Nicholas Zumbulyadis**

10:00 Intermission.

10:15 10. From honey wine to cultivation of the grape: An early history of fermented beverages. **Seth C. Rasmussen**

11:00 11. Metals of antiquity and their alloys. **Vera V. Mainz**

MONDAY AFTERNOON

Section A

Sheraton Denver Downtown - Tower Court D

Chemical Technology in Antiquity

Cosponsored by MPPG, ANYL, CHED, INOR, ORGN

S. C. Rasmussen, *Organizer, Presiding*

1:30 12. The skin they were in: Leather and tanning in antiquity. **Christopher L. Heth**

2:00 13. Modern chemistry of the ancient chemical processing of organic dyes and pigments. **Zvi C. Koren**

2:45 14. Scented oils and perfumes in antiquity. **Narayanaganesh Balasubramanian**

3:15 Intermission.

3:30 15. Soap production and use in antiquity. **Kristine L. Konkol**, Seth C. Rasmussen

4:00 16. Modern materials in antiquity: An early history of the art and technology of glass. **Seth C. Rasmussen**

MONDAY EVENING

Section A

Colorado Convention Center - Halls C/D

Sci-Mix

S. C. Rasmussen, *Organizer*

8:00 - 10:00

11, 12, 14. See previous listings.

TUESDAY MORNING

Section A

Sheraton Denver Downtown - Tower Court D

Modern Chemical Warfare: History, Chemistry, Toxicology, Morality

J. Gal, *Organizer*

J. A. Asper, *Presiding*

8:00 Introductory Remarks.

8:05 17. Modern chemical warfare: A historical overview. **Joseph Gal**

8:35 18. German chemists and chemical weapons: Fritz Haber and his legacy. **Sarah Everts**

9:05 19. Chemical warfare and French chemists. **Pierre Laszlo**

9:35 Intermission.

9:50 20. American chemists and chemical warfare. **Thomas T. Tidwell**

10:20 "Haber: The Father of Chemical Warfare", a film by Daniel Ragussis

11:00 Q&A with Daniel Ragussis

Sheraton Denver Downtown - Tower Court D

Modern Chemical Warfare: History, Chemistry, Toxicology, Morality

J. Gal, *Organizer, Presiding*

1:00 21. Chemical weapons: Clinical description and discussion of basic injuries. **David Gilmore**

1:30 22. Aiming chemical weapons at student engagement: Chemistry and war as a first year seminar.
Janet A. Asper

2:00 23. Modern chemical warfare: A philatelic chronology. **Daniel Rabinovich**

2:30 24. Chemical warfare: The American WWII aftermath. **Douglas C. Neckers**

3:00 Intermission.

3:15 25. Nerve agents: From inception to current concepts. **Sage W. Wiener**

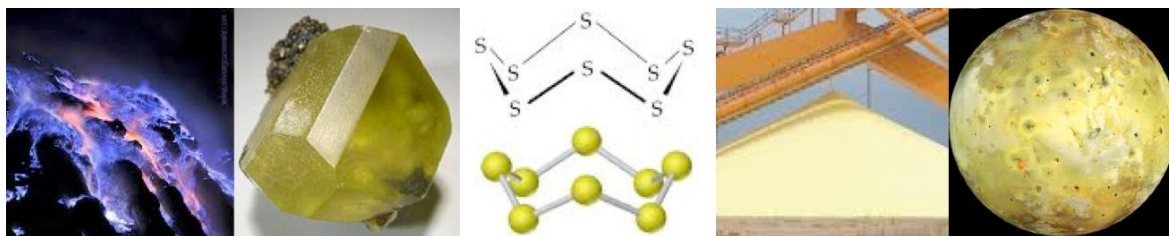
3:45 26. Ethics of chemical weapons research. **Jeffrey D. Kovac**

4:15 27. OPCW: Working for a world free of chemical weapons. Daniel Feakes, **Alexander Kelle**

HIST 1 - HIST Tutorial: Elemental sulfur – a natural (and unnatural) resource

Margaret Schott, Chemistry, Northwestern University, Evanston, Illinois, United States

The story of elemental sulfur (S_8), which has also been called brimstone since biblical times, is a fascinating one. And yet how many of us know the natural origins of this solid yellow substance that is capable of adopting such a wide array of crystalline forms? The purpose of this tutorial is to provide an overview of (i) the known processes, namely volcanogenic and biogenic, for the formation of S_8 in Earth's geologic history, (ii) traditional methods for the extraction of sulfur from Earth's crust, (iii) contemporary methods for the synthesis of "unnatural" S_8 from sulfur-containing components in unrefined fossil fuels, (iv) some properties of the linear and cyclic allotropes of sulfur, ranging from gaseous S_2 up to polycatena S_n (where $n > 1000$), (v) the long-distance transport of molten sulfur, and (vi) the major industrial uses of S_8 in sulfuric acid production, rubber vulcanization, and the formulation of medicinal agents, black gunpowder, fireworks, and more. The talk will be illustrated throughout with chemical structures and equations as well as historical images and original artwork.



HIST 2 - James Hyatt, chemist, scientist, and communicator: A man of his times

William Palmer, SMEC, Curtin University, Brighton, Victoria, Australia

James Hyatt was born in 1817 in New York. Little has been discovered about his education but he obtained a doctorate. He wrote a number of text books including *First lessons in chemistry*, (1839), *Lime and marl: their agricultural uses* (1848), *The elements of chemistry*, (1856) and *Periodicity in vegetation* (1875).

He was an early member of the American Association for the Advancement of Science and a popular lecturer. An interesting feature of his 1856 textbook was his social concern, as he believed that if the children of 'the labouring classes' were taught chemistry, they would be paid more for their work. He also emphasised the uses of chemistry in providing 'human necessity, comfort, health, and life'. His chemistry text published in 1856 (four years prior to the Karlsruhe Conference) makes the assumption that the chemical formula for water was (HO) and he did not consider the common gases to be diatomic. These features were common in textbooks of the time, but his clarity in expressing these concepts may have been the reason why there was no second edition of his book.

Another aspect of James Hyatt's life was his habit of breathing in the chlorine gas in the belief that it assisted his good health; again this was a common view. He also habitually breathed in 'nitrous oxide ... 'whence it is known as exhilarating or laughing gas'. He lived to the ripe old age of eighty-seven, promoting science to the end.

HIST 3 - Inaccuracy of dates in accounts of the history of chemistry: A case of deliberate falsification?

Joseph Gal, Departments of Medicine and Pathology, University of Colorado School of Medicine, Aurora, Colorado, United States; Clinical Laboratories A-022, University of Colorado Hospital, Aurora, Colorado, United States

In historiography, accuracy in dates is essential, yet inaccurate dates are common in the literature, for several reasons. A particularly troubling case of an apparently deliberate falsification of an important date in chemistry concerns the historic announcement by Louis Pasteur (1822-1895) of his discovery of molecular chirality to the *Académie des sciences* in Paris on Monday, May 22nd, 1848. The literature nearly completely ignores this date, favouring instead Monday, May 15th, 1848 (i.e., a week earlier), which first surfaced in 1922 in Pasteur's collected works edited by his grandson Louis Pasteur Vallery-Radot. On Sunday, May 21st, 1848, i.e., one day before Pasteur's presentation in Paris, his mother died suddenly of a stroke in Arbois, eastern France. Pasteur probably

did not learn of her demise in time, but in any case he left for Arbois only after his presentation. Biographies of Pasteur by his son-in-law René Vallery-Radot or the grandson and Pasteur's collected correspondence edited by the grandson are puzzlingly silent about Pasteur's historic presentation. An examination of a variety of relevant information strongly suggests that the biographer relatives deliberately suppressed the correct date, presumably for fear of adverse public judgment of Pasteur for a real or perceived insensitivity to a grave family medical emergency, inasmuch as Pasteur remained in Paris and lectured there on the day after his mother's death. Such fear would have been expected from the two relatives, who throughout their works on Pasteur built a hagiographic image of Pasteur as a 'lay saint'. Since the correct date is clear from the publication of Pasteur's lecture in the proceedings of the *Académie*, its near-complete replacement in the literature with an incorrect date requires an explanation, which is most likely that Pasteur's collected works edited by the grandson are much more widely available than the proceedings of the *Académie*.

HIST 4 - Rules, formulas, names: The lexical legacy of the 1892 Geneva Nomenclature Congress

Evan Hepler-Smith, Program in History of Science, Princeton University, Princeton, New Jersey, United States

There are three characteristic features of systematic nomenclature in modern organic chemistry. First, the prefixes, suffixes, and root of the systematic name correspond precisely to sections of the structural formula of the molecule to which it refers. Second, this mode of identification and ordering is the foundation of how organic compounds are represented and indexed in chemical information systems. Third, most chemists - even organic chemists - want as little to do with these names as possible. These three features of systematic nomenclature - its correspondence to structural formulas, its importance for the structure of chemical information, and its perceived disconnection from the concerns of the daily practice of chemistry - are all rooted in the events of the Geneva Nomenclature Congress of 1892. This meeting brought together a small group of Europe's foremost organic chemists to work out a set of rules for naming organic chemical substances. One faction, led by French chemist Charles Friedel, favored creating a flexible nomenclature that express the various functional properties of compounds in their names. Another faction, led by German chemist Adolf von Baeyer, wished to codify a set of rules that would directly map structural formulas into systematic names, so that a list of tens of thousands of compounds could be ordered by name in a manner that grouped compounds by structure. In this paper, I will discuss the arguments that each group presented, and draw out some of the consequences of the victory of Baeyer's plan for the shape of the Geneva Nomenclature, for subsequent systems of organic nomenclature, and even for the enduring practice of representing molecules by means of two-dimensional structural formulas.

HIST 5 - NMR characterization of resin blocks from 13th century Java Sea Wreck

Joseph Lambert and Allison Levy, Department of Chemistry, Trinity University, San Antonio, Texas, United States, United States

Resin blocks from the 13th century Java Sea Wreck (a total of 16 samples, provided by the Field Museum, Chicago, IL) have been analyzed by solid state carbon-13 nuclear magnetic resonance (NMR) spectroscopy in order to develop our understanding of exchange and commerce in East and Southeast Asia and the Indian Ocean region in the early to mid-second millennium A.D. All samples but one had common NMR fingerprints by all spectral tests, characteristic of NMR Group B ambers. The exception, sample 1560, had a carbon-13 NMR fingerprint that suggests a compound with a carbon framework composed entirely of carbonyl groups; this sample is believed to be an inorganic carbonate. The effect of a saline environment on amber was also analyzed for the fifteen remaining samples, and NMR analysis revealed that saline environments affect the perceived maturity of the sample. Investigation into the provenance of the samples was completed by visual inspection of spectra of known samples from East and Southeast Asia and the Indian Ocean region. Chinese and Middle Eastern origins were eliminated because these ambers are characteristically Group A. Australia and Papua New Guinea were eliminated because spectra of known Australian and Papua New Guinean samples are visually inconsistent with those of the Java Sea Wreck samples. Indonesian origin was also eliminated because previous study revealed that Indonesian samples have two distinct peaks at $\delta 5.5$; these two peaks are not seen in the spectra of the resin blocks. However, the spectra of the resin blocks have a clear resemblance to the spectrum of sample 139 from the Indian state of Gujarat. The spectra of the Java Sea Wreck samples are consistent with having originated from Gujarat, India. Additionally, 13th century Chinese export patterns are also consistent with the samples having originated from Gujarat, India.

HIST 6 - Investigation into the first isolation of carbonic acid

Reggie Hudson, Astrochemistry Laboratory, Code 691, NASA Goddard Space Flight Center, Greenbelt, Maryland, United States

Carbonic acid (H_2CO_3) has a claim to be the most-widely synthesized compound of all budding chemists as it is produced by mixing vinegar and baking soda. More-experienced chemists recognize H_2CO_3 as an unstable material that is present in terrestrial systems, including the human body, only in submicromolar concentrations. However, the initial isolation of H_2CO_3 was carried out not by chemists but by two physicists with chemical interests and under distinctly non-biological, non-terrestrial experimental conditions. The history of this first synthesis and the acid's isolation will be reviewed in this ACS presentation, the discovery spectrum will be shown, and the subsequent events and chemistry will be described, including the author's minor contribution to the story.

HIST 7 - Foundation and influence of the Sydney School of Coordination Chemistry

Anthony Baker, School of Chemistry and Forensic Science, University of Technology, Sydney, Broadway, New South Wales, Australia

In the 1950s, Australia was a powerhouse of coordination chemistry. The standard monographs of the 1950s and 1960s include a disproportionate number of references to papers from the relatively small Australian academic chemistry community of the time.

The source of this activity was the so-called Sydney School of Coordination Chemistry. Usually the foundation of the Sydney School is credited to the Australian George Joseph Burrows and, in recognition, the senior inorganic chemistry award of the Royal Australian Chemical Institute is the Burrows Award. It appears that the critical event in sparking Burrows' interest in coordination chemistry was the short-term appointment (1919-1921) of Eustace Ebenezer Turner (later FRS) to the University of Sydney. Turner certainly came with some experience in coordination chemistry and had been involved in a debate through the literature with J.A.N. Friend on the bonding within coordination compounds. Coordination chemistry was a hot topic at that time, following on from Alfred Werner's work (Werner was awarded the 1913 Nobel Prize for Chemistry). Burrows was a physical chemist and Turner's work was principally in organic chemistry so perhaps the backgrounds were suitable for a contribution to inorganic chemistry. Burrows published until 1940 and almost all his publications after Turner's visit are in coordination whereas no papers before 1919 were in that field. Burrows' influence on Australian inorganic chemistry was very strong.

The foundation of the Sydney School of Coordination Chemistry will be discussed in detail and the influence of Australian coordination chemists in the 1950s and 1960s will also be considered.

HIST 8 - Pigments in antiquity: Colorful forerunners of every aspect of modern chemistry

Mary Virginia Orna, Chemistry, The College of New Rochelle, New Rochelle, New York, United States

Our ancient forebears certainly made use of colors to color virtually everything they used or had: bodies, caves, pottery, sculpture, stone structures, clothing and other textiles. This paper will document their usage with an emphasis on mineral pigments and how a gradually increasing understanding of the nature of these colorants eventually led to other surprising advances in civilization.

HIST 9 - First artificial material: Ceramics from prehistory to the fall of Rome

Nicholas Zumbulyadis, Independent Scholar, Rochester, New York, United States

The dehydration and irreversible thermal dehydroxylation of clay are among the first chemical reactions humans intentionally used to create a new material. The earliest ceramic objects, ceremonial cult figurines from Dolni Vestonice (Czech Republic) have been dated to 28,000 B.P. The earliest utilitarian pottery are vessels from the Xianrendong cave (China), determined to be 20,000-19,000 old. The earliest ceramics known from the Americas have been found in the lower Amazon Basin in the Caverna de Pedra Pintada and Taperinha near Santarem (Brazil), and were dated to 7,500-7,000 years ago. The archaeological record suggests that pottery was independently invented at multiple locations by hunter-gatherers that predated the emergence of sedentary human populations (i.e. prior to the so-called "Neolithic Revolution"). The compositions of the objects reflect the chemistry of the local natural resources. We will examine the numerous innovations in materials processing

across cultures, some with roots in the Upper Paleolithic that led to ever more refined objects. These innovations include remarkably modern concepts such as improving mechanical properties through the use of fillers, control of reaction kinetics by particle size, carefully timed protocols for redox processes and melting point depression by the addition of fluxes. We will show how utilitarian concerns and aesthetic impulses have driven in tandem the development of glazes, polychromy, and sophisticated kilns capable of higher temperatures and controlled kiln atmospheres leading to advanced ceramics. We will also examine accounts of ceramic technology in the earliest chemical texts and the relationship of ceramics to glassmaking and metallurgy.

HIST 10 - From honey wine to cultivation of the grape: An early history of fermented beverages

Seth Rasmussen, *Department of Chemistry and Biochemistry, North Dakota State University, Fargo, North Dakota, United States*

It is generally believed that the origin of alcoholic fermented beverages is shrouded in the mists of human prehistory. While its specific origins are uncertain, it is clear that the production of alcohol via fermentation is one of the oldest forms of chemical technology, with the production of fermented beverages such as mead, beer, and wine predating the smelting of metals. As a result of the intoxicating effects of these drinks, as well as their perceived pharmacological and nutritional benefits, fermented beverages have also played key roles in the development of human culture, contributing to the advancement of agriculture, horticulture, and food-processing techniques. A general overview of the early history and chemistry of fermented beverages and their uses will be presented.

HIST 11 - Metals of antiquity and their alloys

Vera Mainz, *School of Chemical Sciences, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States*

The first metals discovered by man were likely gold and copper, as these can be found in forms pure enough for immediate working. The other “metals of antiquity” were silver, tin, lead, iron and mercury, bringing the total metals known to ancient man to seven. The most important alloys of these metals were bronze (copper and tin) and electrum (gold and silver). Most of these metals had to be found, usually as an ore, and reacted under a controlled temperature and atmosphere to give the metal. The metal then had to be collected and then worked to give the final desirable properties and shape. I will give an historic account of how such a relatively complicated process was evolved by primitive man and the chemistry involved.

HIST 12 - The skin they were in: Leather and tanning in antiquity

Christopher Heth, *School of Physical Sciences, Lake Superior State University, Sault Ste. Marie, Michigan, United States*

As the prehistoric human creature expanded geographically toward more extreme climates, early man began to use the pelts of other animals for clothing and shelter for protection from the elements and other physical dangers. With further technological development, skins and hides found additional uses as shoes, armor, or other equipment such as livestock harnesses. In order for this to be practical, means of retarding or preventing the rapid decomposition of the hide material was necessary. A variety of treatment processes were developed, with many of them also altering the physical properties of the hides, rendering the leather material harder, stiffer, or more durable than the original hides. The treatment methods available to early tanners will be discussed, including archeological evidence of these methods and discussion of the chemical changes that occur during these tanning processes.

HIST 13 - Modern chemistry of the ancient chemical processing of organic dyes and pigments

Zvi Koren, *The Edelstein Center for the Analysis of Ancient Artifacts, Israel; Department of Chemical Engineering, Shenkar College of Engineering, Design and Art, Ramat-Gan, Israel*

The ancient dyer was an advanced chemist! He (or she) utilized vast empirical know-how to produce colorful long-lasting dyeings that have withstood the ravages of time. When the dyer used the full spectrum of the natural dyestuff sources available he also applied his practical knowledge of botany, entomology, and malacology.

A discussion of the colorants used in ancient – and modern – times requires understanding the difference between a “pigment” and a “dye”, which unfortunately have sometimes been erroneously used interchangeably.

A pigment is a water-insoluble colorant used on a surface to paint a wall (as in frescoes), canvas (paintings), vessel, to print or paint on a textile, or even on a body part; in ancient times, most paint pigments were of an inorganic, mineral, nature. Conversely, a dye is a water-soluble organic colorant and that word is specifically used when the purpose of this colorant is to dye a textile and producing a true dyeing. In antiquity, some dyes were chemically transformed into pigments by complexing with a metallic ion, and, likewise, a pigment was transformed into a dye by, for example, reducing the pigment to its water-soluble counterpart.

While inorganic pigments produce magnificent colors, the most elaborate chemical processing of colorants in antiquity – from the source to the final product – involved organic dyes from flora and fauna sources and the subsequent dyeing steps. Thus, by controlling the pH and the temperature of the dye bath, the ancient dyer mastered advanced chemical topics, such as, ionic, covalent, and intermolecular chemical bonding, organometallic complexation, enzymatic hydrolysis, photochemical chromogenic precursor oxidation, anaerobic bacterial fermentative reduction and air-oxidation.

The talk will highlight numerous examples of archaeological dyeings and pigments analyzed by the speaker from the Near East from the Late Chalcolithic, Pharaonic, Phoenician, Persian, and Roman Periods and their modern ancient chemistries.

HIST 14 - Scented oils and perfumes in antiquity

Narayanaganes Balasubramanian, *Chemistry and Biochemistry, North Dakota State University, Fargo, North Dakota, United States*

Scented oils and perfumes have fascinated mankind with their very existence. The first knowledge and use of these materials is buried within the layers of time, with evidence of their usage thought to date back to the beginning of civilization. Over this time period, both men and women have used oils in their one form or the other, be it as a cure to an ailment or simply as a fragrance-enhancing component. Although various materials and archeological evidence has been collected over the years on the use of oils and perfumes, the lack of written documentation makes it difficult to paint a picture of their status in early humans life and its history tends to exist via numerous interesting anecdotes. This talk will summarize what is known of the history of the development and use of oils and perfumes in antiquity with a closer look at the scientific validity of some common anecdotes. Such anecdotes include how the young king Tutankhamen was buried with so many fragrances for the afterlife, Queen Cleopatra who wooed Julius Caesar with lavish fragrances, and an Egyptian queen who used her perfumes as a mystic power.

HIST 15 - Soap production and use in antiquity

Kristine Konkol and Seth Rasmussen, *Department of Chemistry and Biochemistry, North Dakota State University, Fargo, North Dakota, United States*

The production of soap is one of the later forms of chemical technology in the ancient world, where the earliest written record of soap production dates to ~2500 BCE from Sumerian clay tablets. As soap can be produced through the simple combination of potash and animal fat, it is quite possible that it was formed prior to that time period, although no empirical evidence for its earlier existence has been found. It is to be noted that much of the soap manufactured at that time was either soft or liquid in consistency, with hard soap believed to be a more recent development. An overview of the historical production and usage of soap will be presented, pertaining to its origins in antiquity through the Roman era.

HIST 16 - Modern materials in antiquity: An early history of the art and technology of glass

Seth Rasmussen, *Department of Chemistry and Biochemistry, North Dakota State University, Fargo, North Dakota, United States*

Glass and its uses predate recorded history. Even before the ability to manufacture glass, early tribes discovered and shaped nature glass such as obsidian. The technology of synthetic glass production, however, is thought to date back to no later than 3000 BCE. This glass technology was not discovered fully formed, but grew slowly through continued development of both chemical composition and techniques for its production, manipulation, and material applications. This development had become fairly advanced by the Roman period, and the 1st to 4th century CE is often described as the First Golden Age of Glass. During this time, glass was widely used and glass objects started to become as widespread as pottery. By the 4th century, glass use had developed to the point that certain kinds of glass were actually considered a household necessity, although many still remained luxury items. A general overview of the early history and chemistry of glass and its use will be presented.

HIST 17 - Modern chemical warfare: A historical overview

Joseph Gal, *University of Colorado School of Medicine, UCH Mail Stop A-022, Aurora 80045, Colorado, United States*

Chemical warfare (CW) is millennia-old, but modern CW began in World War I (WWI) when in April 1915 the German army released chlorine gas on the Belgian front, killing or injuring thousands of Allied soldiers. The Allies responded in kind, and Great Britain and France engaged extensively in CW. The US entered WWI late (1917) and also engaged in CW. The Hague treaties (1899, 1907) unequivocally banned chemical weapons (CHEWEs) but were ignored by the belligerents. Ca. 50 substances were used as CHEWEs in WWI, some lethal poisons while others 'incapacitating agents', e.g., lachrymators and nasopharyngeal irritants. Mustard 'gas' [*bis*(2-chloroethyl) sulfide] was particularly devastating. Ca. 91,000 were killed by CHEWEs in WWI and 1.2 million injured; many were left with long-term severe physical or psychological wounds. CW provided no strategic advantage in WWI. On both sides, many scientists, including eminent chemists, participated in CW work, e.g., F. Haber (Nobel laureate, 1918), O. Hahn (Nobel 1944), H.O. Wieland (Nobel 1927), G.N. Lewis, J.B. Conant, W.J. Pope, V. Grignard (Nobel 1912), etc. But some scientists refused to participate, on moral grounds, e.g., E. Rutherford (Nobel 1908), H. Staudinger (Nobel 1953), M. Born (Nobel 1954). Indeed, WWI CW raises difficult questions concerning the ethics of scientist participation in war-related work. Since WWI, other treaties have prohibited CHEWEs (e.g., Geneva Protocol, 1925; Chemical Weapons Convention, 1997, administered in The Hague by the Organization for the Prohibition of Chemical Weapons, OPCW) but CW has nevertheless continued to the present, often targeting civilian populations. The 'chemical weapons' of WWII were the incendiary agents (napalm, magnesium, etc.), used extensively to firebomb Japanese and German cities. New, extremely toxic CHEWEs ('nerve agents', e.g., sarin, VX) have been developed and used (e.g., Syria, 2013). For their efforts to eliminate CHEWEs, OPCW was awarded the Nobel Peace Prize in 2013.

HIST 18 - German chemists and chemical weapons: Fritz Haber and his legacy

Sarah Everts, *Chemical & Engineering News, Berlin, Germany*

Rarely in science is a single name tied to a discovery, let alone an entire field of research. Yet Fritz Haber is widely touted as the father of chemical weapons, even though many others have conceived of and deployed these sorts of arms. Like a father, Haber shepherded the development of chlorine gas, phosgene gas and mustard gas for use as World War I weapons; he travelled to war torn areas to see his scientific progeny deployed; and he remained a loyal proponent of gas weaponry until his death, arguing that this form of armament was more humane than traditional bullets. Haber's devotion to chemical weapons was so deep that he also participated in secret research after World War I, in contravention of the Treaty of Versailles.

His devotion to chemical weaponry can be hard for many to fathom given that Haber had also used his exceptional intelligence to develop a cheap and efficient way to make fertilizer, and in doing so helped feed humanity's growing population. This presentation will follow the trajectory of Haber's life, examining his science, his relationships with friends and family, and his tragic end as a displaced Jew in pre-World War II Europe. If time permits, the talk will also address other significant German contributions to the development of chemical weapons.

HIST 19 - Chemical warfare and French chemists

Pierre Laszlo, Ecole polytechnique, Palaiseau, France and University of Liège, Belgium. «Cloud's Rest», Prades, F-12320 Sénergues, France

First use of gases by the German military did not catch the French totally unprepared. Prior to the start of the Great War, there had been some experimentation, under great secrecy. As soon as it became evident that France had to engage in chemical warfare as well, a task force was assembled. The elite of French chemistry and pharmacy took part in that war effort. After the end of the war, Charles Moureu published in 1920 a rather comprehensive memoir, *La Chimie et la Guerre — Science et Avenir*. One of its purposes was to show Moureu as the leader of the war effort, which was not entirely accurate. We are fortunate to have a letter [1] from Lucien Herr to Albert Thomas, who organized production of armament from his governmental position — at first Under-Secretary of State, later Minister —, with candid sketches of the French chemists involved, Moureu included. Thomas was brilliantly seconded by General Paul Ozil, an alumnus of the Ecole polytechnique who had entered the French Corps of Military Engineers. Ozil had been posted to Madagascar, where he oversaw building of the railroads, overlapping there with General Joseph Joffre, who also belonged to the Corps of Military Engineers. A second section of my paper will address the hospitalization and treatment of gas victims, together with the public horror in France at this new form of warfare, as documented from contemporary accounts in the press and in books. Regarding the latter, André Malraux, in *Les Noyers de l'Altenburg* (1943, 1948) wrote a stylistically admirable account of the first "real-size" use of gases, supervised by Fritz Haber on the Eastern Front, that led to a most unusual scene of fraternization between the soldiers on both sides.

[1] Pierre Laszlo, "Quality information from the grapevine," *Ambix*, 2010, 57(2), 202-215.

HIST 20 - American chemists and chemical warfare

Thomas Tidwell, University of Toronto, Mountain View, California, United States

The United States had avoided the first years of WWI, but in 1918 began producing Lewisite, $C_2H_2AsCl_3$, a potent poison first prepared in the US, for use as a poison gas, and named for the chemist Winford Lee Lewis, but the war ended before it was actually used. Among other American chemists James Bryant Conant (1893-1978) was engaged in development of poison gases during WWI and then became Professor of Organic Chemistry at Harvard. He became President of the University, and in 1941 was President of the National Defense Research Committee. His former student Paul D. Bartlett together with Gardner Swain studied the chemistry of mustard gas, while Louis Fieser invented napalm, extensively utilized in fire bombing of Japan.

HIST 21 - Chemical weapons: Clinical description and discussion of basic injuries

David Gilmore, Emergency Department, Exempla St Joseph Hospital, Colorado Permanente Medical Group, Denver, Colorado, United States

This presentation will provide a clinical description of the basic injuries due to chemical warfare. It will include the original substances brought forth during the Great War of 1914 to 1918. The chemicals utilized may present with characteristic syndromes and medical injuries. It may be helpful, in studying and cataloguing these substances, to understand the various biological and medical effects associated with the use of this type of warfare.

Injuries due to exposure to these substances, whether in manufacturing or use as weapons of mass destruction, may range from mild to life-threatening. Immediate illness followed by varying degrees of chronic injury are common. The onset of death may range from minutes to even months or years. Multiple organ systems may be, and usually are, affected in any one individual. Blindness, suffocation, organ failure, cardiac collapse and severe burns are common. These substances are capable of producing temporary organic and biological damage as well as perhaps even altering the DNA of the victim. Some of these substances are carcinogenic. These chemicals may persist for varying degrees of time in the environment into which they are released. The delivery systems of various compounds demonstrate widely varying degrees of lethality.

HIST 22 - Aiming chemical weapons at student engagement: Chemistry and war as a first year seminar

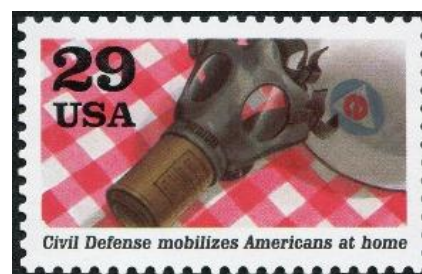
Janet Asper, Chemistry, University of Mary Washington, Fredericksburg, Virginia, United States

As part of the University of Mary Washington's First Year Seminar program, I have taught Chemistry and War to first year college students for 3 years. The students are from all possible majors, and have a wide variety of backgrounds in chemistry and history. This seminar will describe the sources and activities I have used in my course, student reactions to the chemical warfare unit, and my plans for further course development.

HIST 23 - Modern chemical warfare: A philatelic chronology

Daniel Rabinovich, Department of Chemistry, UNC Charlotte, Charlotte, North Carolina, United States

Chemicals, from poisoned arrows and boiling tar to smoke and malodorous substances, have been used as artifacts of warfare for millennia. However, the first large-scale use of a traditional weapon of mass destruction (chemical, biological or nuclear) occurred during World War I, when the German Army released massive amounts of chlorine during the Second Battle of Ypres on 22 April 1915. This presentation will summarize the history of modern chemical weapons as illustrated on postage stamps, including the use of Zyklon B by the Nazis as an effective instrument of death in gas chambers and the use of chemical weapons during the Iran-Iraq War in the 1980's. Postage stamps and other philatelic materials, which are often used as a simple yet effective means of communication to inform the general public about more benign subjects (history, literature, geography, science, etc.), are used here to remind us about the inherent dangers of chemical weapons and the decades-old effort to curtail their use.



HIST 24 - Chemical warfare: The American WWII aftermath

Douglas Neckers, Spectra Group Ltd., Millbury, Ohio, United States

German forces were mostly defeated when the British found Gerhard Schrader in labs in Elberfeld. There, British Col. Paul Tilley managed a first report of the German nerve gasses, sarin and tabun. Soman, the most toxic, originated in Nobel laureate Richard Kuhn's labs in Heidelberg. What followed, attributed to the recently deceased John Dolibois, is that the American stock of nerve gasses came from initiatives of Brigadier General, Charles Loucks, and the assistance of numerous Nazi chemists. In an era of fear, a single general could accomplish so much potential devastation. Our knowledge of how the structural information about the phosphonofluoridates penetrated the American academic community isn't known. Organic chemists then hid these carefully from their students. And American army chemists, during WWII, spent time dropping known halogenated lachrymators on terrain increasingly similar to that expected in the islands leading up to Japan, and developing instruments to measure the residues. Noyes, Jr. (1948) Ed. Chemistry for his part says nothing about nerve gasses. Schrader testified in the Nuremberg Farben trial, and the structures of tabun and sarin came up, as did his research philosophy. But these were military trials; chemists were not central to the questioning of their German counterparts, nor were these reports known until much later. Near that time, Morris Kharasch (Chicago) penetrated the Army Chemical Corps after the War, and convinced the Army that it needed to know more about the organic chemistry of phosphorus. So under this guidance, numerous young scientists were funded to study that. Basic chemistry resulted that remains of interest. This talk will be tinged with WWII history and trace the trail of organic phosphorus chemistry from Elberfeld to Muscle Shoals; from Braunschweig to Lawrence, Kansas and parts beyond.

HIST 25 - Nerve agents: From inception to current concepts

Sage Wiener, SUNY Downstate Medical Center, Department of Emergency Medicine, 450 Clarkson Ave, Brooklyn 11203, New York, United States

Organophosphorus compounds were first synthesized in 1854. After World War I, German scientist Gerhard Schrader discovered Tabun (GA), the first nerve agent. Although he had been trying to develop pesticides for the chemical manufacturer IG Farbenindustrie, he recognized the potential of these agents as chemical weapons. By the end of World War II, Germany had developed several for this purpose, known as the G series (for German)

of organophosphates, including Sarin (GB) and Soman (GD). During the Cold War, both American and Soviet scientists developed organophosphates as weapons, including what is now known as the V series (for vesicant), including VX. Physical properties of individual nerve agents make some more of a threat when inhaled as an aerosol, while others are most dangerous when absorbed through the skin. These properties also determine the persistency of an agent. Clinical experience with patients poisoned by nerve agents is limited, although there is extensive experience with patients poisoned by organophosphate pesticides. However, data are available from the Sarin attack on the Tokyo subway in 1995, and to lesser extent from use in Iraq in 1988 and more recently in Syria. All organophosphates act by inhibiting cholinesterases in both muscarinic and nicotinic synapses, leading to excess parasympathetic action and paralysis, as well as effects in the brain that are not as well understood. Compared to organophosphate pesticides, nerve agents appear to have greater effect on the cholinesterases in the neuromuscular junction. Elements of treatment include decontamination, atropine, a muscarinic antagonist, and cholinesterase reactivators called oximes, although the utility of oximes is controversial.

HIST 26 - Ethics of chemical weapons research

Jeffrey Kovac, Univ. of Tennessee, Knoxville, Tennessee, United States

Throughout history, the use of chemical weapons in warfare has been controversial. The morality of chemical weapons research is similarly controversial because several potentially conflicting obligations and codes of ethics impact the decision of the individual chemist as to whether to participate in such research. In this presentation I will discuss the complex ethical questions surrounding chemical weapons research. All chemists are members of a national community with the obligations of citizenship, but they are also professionals subject to a code of ethics. Of course, they are also members of the human community and consequently subject to the more or less universal common morality. Membership in a religious community might also add moral restraints. A key question for chemists is whether the current code of ethics can provide adequate guidance in trying to deal with this complex issue.

HIST 27 - OPCW: Working for a world free of chemical weapons

Daniel Feakes and Alexander Kelle, OPCW, The Hague, Netherlands

This presentation will describe the history and background to the negotiation and entry into force of the only multilateral treaty to verifiably ban an entire class of weapons of mass destruction - the Chemical Weapons Convention. One hundred years after their first large-scale use on the battlefields of the First World War, chemical weapons are now comprehensively prohibited by a treaty to which 190 states are party. This presentation will describe the programmes and activities of the international organisation created to oversee the implementation of this treaty - the Organisation for the Prohibition of Chemical Weapons (OPCW). The OPCW's achievements were recognised by the award of the Nobel Peace Prize in 2013. The presentation will conclude with an overview of recent OPCW activities in collaboration with the United Nations to eliminate Syria's chemical weapons and with an overview of the future priorities of the OPCW as, one hundred years after their first use, we are finally moving towards a world free of chemical weapons.