

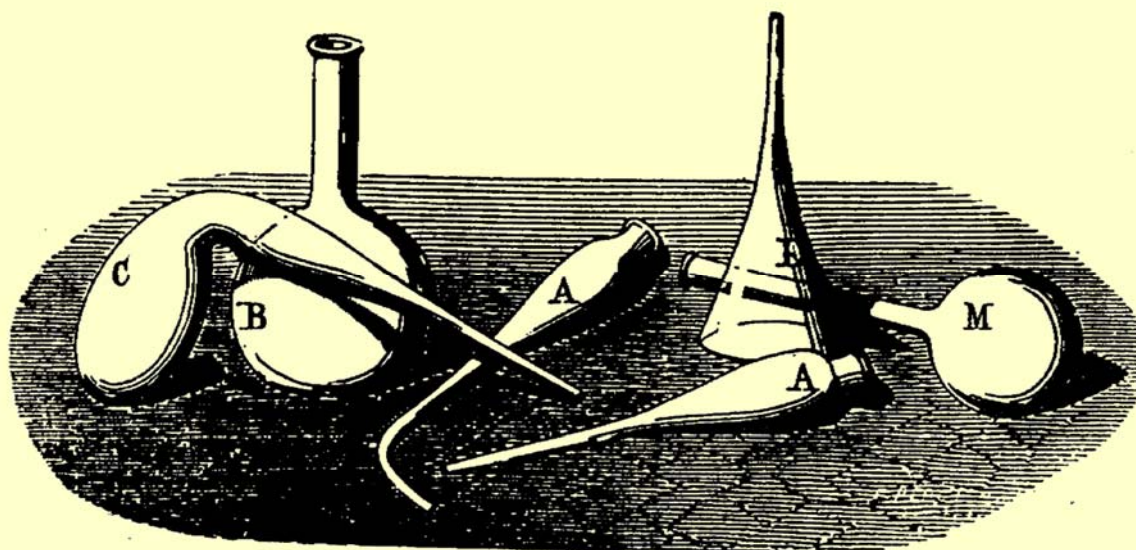


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American Chemical Society

# DIVISION OF THE HISTORY OF CHEMISTRY



## NEWSLETTER, PROGRAM & ABSTRACTS

248<sup>th</sup> ACS National Meeting  
San Francisco, CA  
August 10-14, 2014

*S. C. Rasmussen, Program Chair*

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## Mission Statement

The Division of the History of Chemistry (**HIST** - <http://www.scs.illinois.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.

## Message from Ned Heindel, HIST Division Chair

San Francisco meetings are always a highlight of ACS activities. Even in down-economies the Chemistry brotherhood/sisterhood loves to rally in the City by the Bay...must be the cable cars and the sushi. Every Division's programming (including HIST's) is packed full so don't even bother asking Seth to do a last minute insertion of a paper. We've got the 2014 HIST Award and the symposium connected to Professor Homburg's area of scholarship. Mary Virginia Orna's and Marco Fontani's coming out party for their new book is celebrated by their symposium on *Found and Lost: Incredible Tales of Spurious, Erroneous, and Rehabilitated Elements* (Bet you never knew an element could be "rehabilitated"? If you're curious about that process you'll just have to come and Mary Virginia will teach you how it's done!).



And don't forget to attend the Presidential Symposium on the *Science and Legacy of Attila Pavlath* or the *Symposium on the HIST Citation for Chemical Breakthrough Award Program*. Virginia Trimble is going to be your HIST tutor and Seth, our Program Chair, has assembled a superb set of general papers. The Division's social activities are chronicled elsewhere in this newsletter so please do come and network with your colleagues.

One last point, this is my final message as chair. At this meeting I transfer to Gary Patterson, the chair-elect, the key to the HIST Executive Wash Room, the cell phone number of our Divisional chauffeur who is on a 24/7 retainer, and, of course, our sacred gavel carved from the wood of Isaac Newton's apple tree (Gary, no selling that on eBay to raise research funding! I'll be watching.).

It has been a great two years. Thank you all for the opportunity to be your Chair.

*Ned D. Heindel, HIST Chair*

## Message from Gary Patterson, HIST Division Chair-Elect

These are exciting times for the worldwide history of chemistry community. Active groups have formed in many places. The Royal Society of Chemistry now has a history group. The History of Science Society is gaining strength in chemistry. The Europeans have a strong “working group in the History of Chemistry.” And SHAC now has a stronger presence in America. HIST is a partner in all these activities. While HIST is a Division of the American Chemical Society, chemistry is an international community, and we are happy to be a part of it.



The winner of the HIST Award for 2014 is well-known in Europe, but less so in HIST. Please make sure to get to know Ernst Homburg. He is part of the glue that cements the European community in the History of Chemistry. We have also attracted a good group of other Europeans to help celebrate the Award.

Another area of interest for the Chair-elect is the election of the next Chair-elect. Please help the nominating committee identify and recruit the best person you know for this position.

*Gary Patterson, HIST Chair-Elect*

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## Report of Councilors, Division of the History of Chemistry 247<sup>th</sup> ACS National Meeting - Dallas, Texas; March 19, 2014

### Election Results

- The Committee on Nominations and Elections presented to the Council the following nominees for selection as candidates for President-Elect, 2015: Peter K. Dorhout, William A. Lester, Jr., Christopher K. Ober, and Henry F. Schaefer III. By electronic ballot, the Council selected **Peter K. Dorhout** and **William A. Lester, Jr.** as **candidates for 2015 President-Elect**. These two candidates, along with any candidates selected via petitions, will stand for election in the Fall National Election.
- The Committee on Nominations and Elections announced the results of the election to select *candidates* from the list of *nominees* to serve as Directors from District III and District VI on the Board of Directors for the term 2015-2017. Nominees for District III included Dee Ann Castell, Pat N. Confalone, Anne S. DeMasi, and Kathryn E. Uhrich. Nominees for District VI included Allison A. Campbell, Paul W. Jagodzinski, Lee H. Latimer, and Eleanor D. Siebert. By mail ballot, the Councilors from these districts selected **Pat N. Confalone** and **Anne S. DeMasi** as **District III candidates**; and **Paul W. Jagodzinski** and **Lee H. Latimer** as **District VI candidates**. Ballots will be mailed on or before October 10, 2014 to all ACS members in District III and District VI for election of a Director from each District.

### Candidates for Directors-at-Large

- The Committee on Nominations and Elections announced the selection of the following candidates for Directors-at-Large for a 2015-2017 term: Dawn A. Brooks, William F. Carroll, Jr., Barbara A. Sawrey, and Ellen B. Stechel. The election of two Directors-at-Large from among those candidates and any selected via petition will be conducted in the fall. Ballots will be mailed to the Council on or before October 10, 2014.

### Committee Continuance

- As part of a regular performance review, the Council VOTED unanimously to continue the Committees on Chemical Safety, on Chemistry and Public Affairs, and on Minority Affairs. Continuation of these three committees requires Board concurrence.

### 2015 Member Dues

- The Council voted to set the member dues for 2015 at the fully escalated rate of \$158. This rate is established pursuant to an inflation-adjustment formula in the ACS Constitution and Bylaws.

### **Divisional Allotment Formula**

- After voting to postpone its implementation by one year, the Council voted to approve a revised formula for allocating dues funds to divisions. This formula, which was presented by the Committee on Divisional Activities, will be effective with allocations for 2015 division performance. *Please note that the HIST Councilors supported the amendment to postpone the implementation for one year because the reason given for this request was that the larger Divisions, that would stand to lose a certain percentage of their allocations, already had plans in the works based precisely on that allocation and would have appreciated more notice of the change. They did, however, support the new formula even though they would have a slightly reduced allocation because they want to show their support for the smaller Divisions.*

### **Changes in Local Section Territory**

- On recommendation of the Committee on Local Section Activities, the Council voted to approve the petition from the North Jersey Section to include the area of the former Monmouth County Section in its territory, effective immediately.

### **New International Chemical Sciences Chapter**

- On recommendation of the Committee on International Activities and subject to the concurrence of the Board of Directors, the Council voted to approve petitions to charter the South Korea International Chemical Sciences Chapter and the Malaysia International Chemical Sciences Chapter.

### **Society Committee Oral Reports**

#### **Budget and Finance (B&F)**

- In 2013, ACS generated a Net from Operations of \$15.1 million, which was \$2.0 favorable to the budget. This represents the Society's tenth consecutive year of positive operating results. Total revenue was \$490.5 million, which was \$8.8 million (or 1.8%) lower than budget, and essentially flat when compared with 2012. The result was largely attributable to cost containment measures throughout the ACS. Unrestricted Net Assets rebounded in 2013, rising to \$207 million, and more than doubling from the 2012 level.

#### **Education (SOCED)**

- SOCED approved a pilot program to form ACS International Student Chapters.

### **Standing Committee Oral Reports**

#### **Membership Affairs (MAC)**

- For 2014, MAC authorized an individual member test for India to allow for a \$52 full Member dues rate. At this meeting, MAC extended the test to include new and renewing members in India for three years.

#### **Economic and Professional Affairs (CEPA)**

- Findings from the ACS 2103 New Graduate Survey have been compiled and reveal troubling news: overall unemployment among new graduates rose from 12.6% in 2012 to 14.9% in 2013. This is primarily due to the high unemployment among recent Bachelors. New graduates must be at the top of our priority list for employment assistance in 2014.

#### **Meetings and Expositions (M&E)**

- As of this morning (March 19, 2014), the ACS spring national meeting had attracted 13,680 registrants, including 6,853 regular attendees and 5,140 students. The meeting had 10,050 papers presented.
- The new ACS Mobile Application had over 6,000 downloads by meeting attendees.



- M&E voted to eliminate the author index in the hard program meeting program book beginning with the spring 2015 meeting, The searchable author index is now available via the mobile application and other electronic means.

### **Divisional Activities (DAC)**

- Operating as a DAC subcommittee, the Multidisciplinary Planning Group is proposing the following 2017 national meeting themes to the divisions for their consideration:
  - Spring, San Francisco: *Advanced Materials, Technologies, Systems and Processes*
  - Fall, Washington, DC: *Chemistry's Impact on the Global Economy*.

### **Local Section Activities (LSAC)**

- LSAC will initiate the process to dissolve the Ocean County Section as a result of the group's failure to meet the criteria to remain an active section.

### **Other Committee Oral Reports**

#### **Chemical Safety (CCS)**

- CCS has published its first-ever Safety Alert concerning the Rainbow Demonstration, in *Chemical and Engineering News*, March 17, 2014. Copies were distributed to Councilors.

#### **Special Discussion Item**

- A special discussion item was put on the Council agenda for this meeting. ACS President Tom Barton presented and moderated a discussion on "What can ACS do to increase the quality of science education in grades K-12? Following the presentation, 39 Councilors engaged in a robust discussion on the factors impacting the quality of K-12 science education in the U.S.

#### **Activities of HIST Councilors**

**Mary Virginia Orna** – after completing 18 years on the elected Committees of Council (Nominations and Election, Committee on Committees, and Council Policy Committee) began her assignment as an Associate on the Local Section Activities Committee, and the Technology, Tools, and Operations Subcommittee.

**Roger Egolf** – continues to serve on the Divisional Activities Committee and chairs the DAC Constitution and Bylaws Subcommittee. He also serves as DAC liaison to the Constitution and Bylaws Committee of Council and the HIST and SCB Divisions.

*Mary Virginia Orna, Roger A. Egolf, Councilors*

### **2014 HIST Award Banquet**

As part of its activities at the 248th ACS National Meeting in San Francisco, the History of Chemistry Division of the American Chemical Society is pleased to host the 2014 HIST Award Banquet. To be honored at the banquet will be Professor Ernst Homburg, winner of its 2014 HIST Award, and Professor Stephen J. Weininger, winner of its 2013 Outstanding Paper Award. The Banquet will be held at the Far East Café, centrally located in the heart of Chinatown (631 Grant Avenue). The Banquet will start at 7 PM and will feature their Peking Duck & Lobster Dinner. **Tickets are \$30 and can be purchased from Vera Mainz, HIST Secretary-Treasurer** (Tickets cover the full cost of the meal, with the exception of beverages, which can be purchased onsite during the Banquet). The Far East Café is approximately 2 miles from the HIST Technical Sessions at the InterContinental, but is only about two blocks from either the Omni San Francisco or Hilton Financial stops on the Route 3 ACS shuttle.

### **2013 HIST Outstanding Paper Award**

The paper "Chemistry for the "Industrial Classes": Laboratory Instruction, Mass Education and Women's Experience in Mid-Western Land Grant Colleges, 1870-1914," by Dr. Stephen J. Weininger

(Worcester Polytechnic Institute), was selected for the 2013 HIST Outstanding Paper Award. The award is presented to the author of the best paper published in the *Bulletin for the History of Chemistry* during the previous three years, including the award year, and consists of a plaque, a cash award of \$100, and \$150 worth of books from the current publications of Chemical Heritage Foundation. Dr. Weininger will also be a guest of honor at the 2014 HIST Award Banquet to be held at the National ACS Meeting in San Francisco. Dr. Weininger's paper was published in volume 38(2) of the *Bulletin for the History of Chemistry* (2013, pages 97-108).

## A Special Opportunity

The Division of the History of Chemistry is pleased to announce to its members that a complimentary copy of the recently-published volume "The Lost Elements: The Periodic Table's Shadow Side" (by M. Fontani, M. Costa, M.V. Orna; Oxford University Press, 2014) is available upon request. Please send your order to Dr. Vera V. Mainz, Division Treasurer, at mainz@illinois.edu (or by mail to 2709 Holcomb Drive, Urbana, IL 61802). Please include your mailing address and your email address. One copy of the volume per Division member is available on a first-come, first-served basis while supplies last.

In his preface to the book, Nobel Laureate Roald Hoffmann remarked that this is the most entertaining book he has read in decades. There is no other book that gathers into one place the illegal tenants that once occupied the periodic table along with many other "false" or "lost" elements that never made it into the periodic table in the first place. Read how even Nobel Laureates, along with rank amateurs, fell into the trap of proclaiming an elemental discovery when there was nothing there!

Please remember that only members of the HIST Division are eligible for this complimentary volume. If you are not a member, you may join the Division by sending your check for \$20.00 (for residents of North American only) along with your request. Please consult

<http://www.scs.illinois.edu/~mainzv/HIST/info/applic.php> for other membership categories. This unprecedented give-away is made possible by funding from the Ente Cassa di Risparmio di Firenze (The Savings Bank of Florence Charitable Foundation).



ENTE CASSA DI RISPARMIO DI FIRENZE

## HIST to Host Symposium at PACIFICHEM 2015

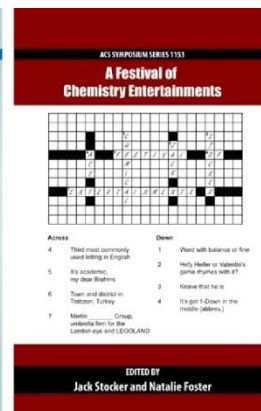
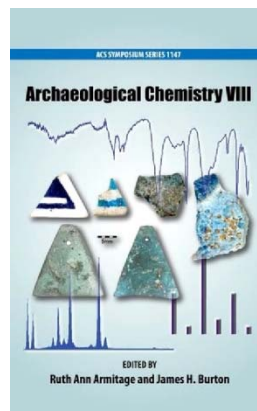
The History of Chemistry Division of the American Chemical Society has organized a historical symposium for the 2015 International Chemical Congress of Pacific Basin Societies (Pacifichem 2015). The HIST-sponsored symposium is entitled *Historical Evolution of the Chemical Community in the Countries 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, with additional invitations still pending. Anyone interested in potentially participating in the symposium should contact either Seth Rasmussen ([seth.rasmussen@ndsu.edu](mailto:seth.rasmussen@ndsu.edu)) or Gary Patterson ([gp9a@andrew.cmu.edu](mailto: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 conference is sponsored jointly by ACS, the Canadian Society for Chemistry (CSC), the Chemical Society of Japan (CSJ), the New Zealand Institute of Chemistry (NZIC), the Royal Australian Chemical Institute (RACI), the Korean Chemical Society (KCS), and the Chinese Chemical Society (CCS). The host society for the 2015 Congress is ACS.  
*Seth C. Rasmussen, Coordinating Symposium Organizer*

## New HIST-Sponsored ACS Symposium Books

The ACS Symposium Series publishes peer-reviewed books developed from the ACS technical divisions' symposia and has been a popular venue for the dissemination of historical work presented as part of the HIST programming at ACS National Meetings. Recently two new HIST-sponsored volumes have become available. The first of these is ACS Symposium Series Volume 1147, *Archaeological Chemistry VIII*, of which the ebook version was published by ACS in October, 2013, with the hardback version released April, 2014. The volume is based on the 12th Archaeological Chemistry Symposium held on April 7-11, 2013 at the New Orleans ACS Meeting, and is a compilation of presentations from the Symposium, the latest in a long tradition that began at the ACS National Meeting in Philadelphia in 1950. Edited by Ruth Ann Armitage and James H. Burton, the volume includes papers that show archaeological chemistry today is more than the usual studies of trace elements in pottery and lithics, which continue to contribute to our understanding of human behavior in the past.

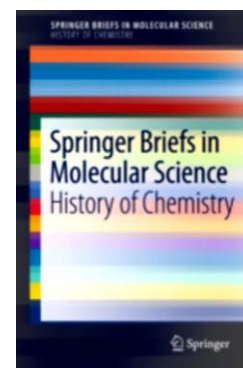


In addition, ACS Symposium Series Volume 1153, *A Festival of Chemistry Entertainments*, was published as an ebook in December 2013, with the hardback version released June, 2014. The volume is based on the symposium of the same name held at the Spring 2008 ACS Meeting in New Orleans. The HIST-sponsored symposium was organized by Jack Stocker and cosponsored by the Bolton Society. Dr. Stocker began work as editor of the current volume, but passed away in 2009, after which Natalie Foster completed the task of collecting the various presented bits of whimsy and humor, both intentional and accidental, from the world of chemistry. From chemistry-based crossword puzzles to papers delivered in verse and song, this is a surprising collection of the quirkiest incidents and episodes in the recent history of chemistry.

## New Springer Briefs in Molecular Science: History of Chemistry Volumes

Two new volumes in this series were published this last spring: *The Quest for Aqua Vitae. The History and Chemistry of Alcohol from Antiquity to the Middle Ages*, by Seth C. Rasmussen, and *Polymer Science from 1935-1953. Consolidating the Paradigm*, by Gary Patterson. Several additional volumes are also nearly ready to go into production and should be released soon. All volumes are currently available via Springer or Amazon in both softcover or ebook formats.

Volumes in the series are 50-125 pages in length, presenting concise summaries of historical topics covering all aspects of chemistry, alchemy, and chemical technology. New authors are always being sought for potential new volumes and those interested in discussing potential topics for future volumes should feel free to contact the Series Editor, Seth Rasmussen ([seth.rasmussen@ndsu.edu](mailto:seth.rasmussen@ndsu.edu)). Please visit <http://www.springer.com/series/10127> for guidelines for submitting volume proposals. *Seth C. Rasmussen, Series Editor*





## Message from the HIST Program Chair

As your Program Chair, I am happy to report that HIST programming for the upcoming meeting in San Francisco is one of our strongest lineups in quite some time (second only to New Orleans, 2013). We will have 48 oral presentations over three and a half days of sessions, which will span four focused symposia, as well as *two!* General Papers sessions. In addition, Virginia Trimble will be presenting the HIST tutorial for San Francisco, entitled *HIST Tutorial: Impact of World War I on chemistry, physics, and astronomy*.



With this wealth of HIST programming, however, it is somewhat disappointing that we will still have only three posters to represent the division in SciMix on Monday night. Not to beat a dead horse, but SciMix is the single best opportunity for us in HIST to share the history of chemistry with the rest of the ACS membership, ***most of which are unaware that ACS even has a HIST division!*** As such, please consider participating in SciMix when submitting your abstracts to HIST. While it does mean preparing a poster in addition to your regular oral presentation, it does go a very long way in promoting the division and contributing to its continued health and prosperity.

In other programming-related news, I am happy to point out that the San Francisco meeting will be our last meeting to use the current PACS for abstracts and programming. The new system will officially be called MAPS (MeeAng AbstrActs ProgramMing System) and is build and maintained by Scholar One, owned by Thompson Reuters. The *Abstract System Replacement Advisory Group* (of which I serve as a member) has been putting it through its paces, system testing via mock meetings, and suggesting improvements, changes, etc. MAPS will officially go online for the Call for Papers of the Spring 2015 meeting in Denver and we all hope that it will be a significant improvement over PACS. With that said, however, it will be a new system, which always means that there will be a learning curve, as well as some unexpected surprises. With that in mind, please try to submit your abstracts early if all possible for Denver. The official deadline for Denver is **November 3rd**, so that gives you ample opportunity to get abstracts in well before the deadline. *In addition, it may be a bit more difficult for the Program Chairs to add late abstracts with the new system (at least initially), so it is all that much more important that you get your abstracts in on time, if not early.*

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](mailto:seth.rasmussen@ndsu.edu)).

*Seth C. Rasmussen, HIST Program Chair*

## HIST SYMPOSIA, 248<sup>th</sup> ACS Meeting in San Francisco, CA, August 10-14, 2014

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

### Symposium on the HIST Citation for Chemical Breakthrough Award Program

In 2006, the Division of the History of Chemistry announced the first recipients of the then new Citation for Chemical Breakthrough award program. This award, which recognizes breakthrough publications, books and patents worldwide in the fields of science embraced by the ACS, are presented to the institutions at which the work was performed. Since that time, 45 awards have been presented (not counting the 2014 award year) in 10 countries (France, Germany, Italy, Latvia, The Netherlands, Poland, Russia, Switzerland, the United Kingdom including England and Scotland, and the United States). This symposium will discuss the overall award program, placing it in the context of HIST's other award programs, as well as focusing on specific individual awards which exemplify the breadth and impact of the awards. Most of the speakers have participated in award presentations and will discuss the impact of these awards in their presentations. The symposium will be held **Sunday afternoon**, August 10, at the InterContinental San Francisco - Twin Peaks.

*J. Seeman, Organizer*

### Found and Lost: Incredible Tales of Spurious, Erroneous and Rehabilitated Elements

*Cosponsored by INOR*

The title of this symposium is just what it says. Hundreds of so-called elements were thought to have been found, only to be lost or ejected from the periodic table when it was learned that they were erroneous discoveries, downright frauds, or sometimes genuine elements, but thought to be false by the “experts” until rehabilitated decades later. This symposium will not cover all of these instances due to lack of time, but it will cover three wrong tracks thought to lead to element 61. Also discussed will be the vexed issue of element 72, perhaps the most contentious priority dispute in elemental history. Other topics to be discussed will be the rediscovery of vanadium as “erythronium,” the first “patented” element, found and lost elements on stamps, and the stories of three ACS Presidents who actually reported discovering elements later shown to be false. In addition to popular authors on the periodic table like Eric Scerri, and the announcement of the publication of the book, “The Lost Elements: The Periodic Table’s Shadow Side,” the symposium will feature keynote speaker Sam Kean, popular science writer and author of “The Disappearing Spoon”. The symposium will be held **Monday morning and afternoon**, August 11, at the InterContinental San Francisco - Grand Ballroom C.

*M. Orna and M. Fontani, Organizers*

### **Science and Legacy of Attila Pavlath**

The 5<sup>th</sup> in a series of symposia on the Science and Legacy of Past ACS Presidents. Join colleagues, friends and family celebrating the career of Attila Pavlath. Be prepared to be surprised at the many contributions of Attila that you did not know about. And maybe share to remembrance of your own. Speakers include: professional colleagues (Ferenc Darvas, pioneer in flow chemistry from Budapest, Hungary, and John Finley USDA colleague), ACS colleagues (Paul Vartanian of California Section ACS and past ACS president Ann Nalley) and son George Pavlath. The symposium will be held **Tuesday morning**, August 12, at the Moscone West - Room 3002.

*J. Hayes, Organizer*

### **HIST Award Symposium Honoring Ernst Homburg**

An international group of historians of chemistry will give papers in celebration of Ernst Homburg. Gary Patterson will be in the Chair. Peter Morris, the official nominator, will give a few introductory remarks and present a paper on “The chemist and the laboratory.” The kind of chemistry that can be done is determined by the kinds of laboratories available to the chemist, but the kinds of laboratories available are often determined by the desires of the chemist. The history of this interaction over the last 400 years will be surveyed. Brigitte van Tiggelen, the Belgian historian of chemistry, will discuss “Women chemists in the 18th century in France, with an emphasis on Madame d’Arconville.” Alan Rocke, from Case Western Reserve University, will examine the German context with a paper “Science versus practice’ and the German chemist ca. 1860: Erlenmeyer in context.” Will the biographer of Kolbe reveal the real Erlenmeyer? Carsten Reinhardt, President of the Chemical Heritage Foundation, will present some thoughts on “Identities in twentieth century.” The landscape of chemistry changed radically during this period due to both geographical and demographic factors. John K. Smith, from Lehigh University, will discuss “Chemists in American industry between the world wars.” Sy Mauskopf will examine “Patents, powders, profits: the significance of the patent infringement trial, Nobel’s Explosives Co. v. Anderson (1894).” And Ernst Homburg, from Maastricht University in the Netherlands, will present the Prize lecture: “Chemists and chemical societies: 1500-1900.” Concluding remarks by Arnold Thackray will lead into the celebration dinner. The symposium will be held **Tuesday afternoon**, August 12, at the InterContinental San Francisco - Twin Peaks.

*P. Morris and G. Patterson, Organizers*

## UPCOMING NATIONAL MEETINGS AND HIST DEADLINES

Offerings are subject to change. Check the [HIST website](#) for updates.

### Denver, March 22-26, 2015

Submit your abstract via the new online Meeting Abstracts Programming System (MAPS) by **November 3rd, 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](mailto:seth.rasmussen@ndsu.edu)). Check the call for papers in *Chemical and Engineering News* or [www.acs.org](http://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](mailto:seth.rasmussen@ndsu.edu)

**Modern Chemical Warfare: History, Science, Toxicology, and Morality.** (Invited) Joseph Gal, Department of Medicine and Department of Pathology, University of Colorado School of Medicine, Aurora, Colorado 80045, Email: [joe.gal@ucdenver.edu](mailto:joe.gal@ucdenver.edu)

**Chemical Technology in Antiquity.** (Invited) 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](mailto:seth.rasmussen@ndsu.edu)

### Boston, August 16-20, 2015

**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](mailto: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](mailto: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](mailto:rae4@psu.edu)

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## News from the Chemical Heritage Foundation

The [Chemical Heritage Foundation](http://www.chemheritage.org/) - <http://www.chemheritage.org/> (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.

### 2014 Biotechnology Heritage Award

CHF and the Biotechnology Industry Organization (BIO) selected Robert Langer as the winner of the 2014 Biotechnology Heritage Award. The award was presented during BIO's annual international convention, held in San Diego, June 23–26, 2014.

Robert S. Langer is the David H. Koch Institute Professor at the Massachusetts Institute of Technology. He has written over 1,240 articles and is the most cited engineer in history. He holds 1,026 patents (512 issued) worldwide, which have been licensed or sublicensed to over 250 pharmaceutical, chemical, biotechnology, and medical-device companies. He served as a member of the U.S. Food and Drug Administration's Science Board from 1995 to 2002 and as its chairman from 1999 to 2002.

Langer has been honored with over 220 major awards. He is one of seven individuals to have received both the U.S. National Medal of Science and the National Medal of Technology and Innovation. He has also received the Charles Stark Draper Prize, the Millennium Prize, the Priestley Medal, the Wolf Prize in Chemistry, and the Breakthrough Prize in Life Sciences. He is the only engineer to have been given the Gairdner Foundation International Award. In 1998 he received the Lemelson-MIT Prize for being “one of history’s most prolific inventors in medicine.” Langer has been elected to the Institute of Medicine of the National Academy of Sciences, the National Academy of Engineering, the National Academy of Sciences, and the National Academy of Inventors.

Forbes (1999) and BioWorld (1990) named Langer one of the 25 most important individuals in biotechnology in the world. Time and CNN (2001) named him one of the 100 most important people in America and one of the 18 top people in science or medicine in America. Langer has received 22 honorary doctorates from institutions including Harvard University, the Mt. Sinai School of Medicine, Yale University, and the Eidgenössische Technische Hochschule. He received a bachelor’s degree from Cornell University in 1970 and an ScD from MIT in 1974, both in chemical engineering.

### **2014 Franklin-Lavoisier Prize**

CHF and the Fondation de la Maison de la Chimie (FMC) presented the Franklin-Lavoisier Prize to Fred Aftalion on April 3, 2014, at the CHF headquarters in Philadelphia.

A graduate of the École Nationale Supérieure de Chimie de Paris, Aftalion devoted his life’s work to chemistry. He studied under Herman Mark in Brooklyn Polytechnic’s Polymer Institute in 1946. His first job in the chemical industry was as an engineer with Hercules, with which he spent five years in the United States and Latin America. Returning to France in 1951, he joined Naphtachimie, where he set up the marketing networks of what was then a new petrochemicals company.

Called in by Laboratoire Roger Bellon in 1956 to take over the management of the Société Française d’Organo-Synthèse (SFOS), he turned it over the course of the next three decades into an efficient specialty chemicals enterprise. Aftalion also served as president of Société la Vermiculite et la Perlite, now an affiliate of Elf Aquitaine, and he became a board member of Rhône Poulenc Spécialités Chimiques when SFOS was acquired by that company. He is currently a member of the Board of Directors of Total Chimie and of the Maison de la Chimie.

As an author, Fred Aftalion has recorded and enhanced our understanding of our chemical heritage, as well as made known the important impact of the chemical sciences and technologies among the broader public. His book, *A History of the International Chemical Industry*, is a seminal work of history and a unique publication, chronicling the rise of the chemical industry around the globe and the important human benefits that it has brought. The only book of its kind, *A History of the International Chemical Industry* has also advanced the sense of community among the various participants in the chemical endeavor.

## **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.

### **The Rare Book Collection of the Middle Temple Library, London**

The Middle Temple Library is one of the last places where you might expect to find alchemical and occult rare books, but it includes a sizeable portion of John Donne’s library (79 books, largest collection of any institution), 28 defences of Rosicrucianism at the height of the early seventeenth-century furore, and over 73 books on alchemy, printed between 1538 and 1637. The earliest alchemical book is the 1538 *Alchimia* by Petrus Kertzenmacher (printed in Strasbourg), one of only two copies in the UK. Other gems include a John Dee’s copy of *De typographiae inventione*, printed in Copenhagen in 1566, six books on palmistry, dating from 1538 to 1621, and a German illustrated manuscript dated ca. 1390-1415 on astrology, astronomy, calendars and fortune-telling. Limited finances mean that advertising is mainly by word-of-mouth and by

the enterprising spirit of Senior Librarian, Renae Satterley, who is always seeking to uncover new avenues of promoting the library's collection. Needless to say, she would welcome anyone with a scholarly interest in the Middle Temple rare books and would be pleased to hear from historians of alchemy and early chemistry, who can contact her at [r.satterley@middletemple.org.uk](mailto:r.satterley@middletemple.org.uk) in order to make an appointment to see one or more books. The collection can be consulted from 10 am to 5 pm Monday to Friday in the main hall of the Middle Temple Library and the Library catalogue can be accessed at <http://www.middletemplelibrary.org.uk/client/default>.

### **Sources of Alchemy and Chemistry**

Last year, SHAC launched a new series of monograph-length volumes: *Sources of Alchemy and Chemistry: Sir Robert Mond Studies in Early Chemistry*. This series provides critical editions and English translations of some of the foundational texts in the history of alchemy and early chemistry. The series is named in honour of the Society's first and only President, Sir Robert Mond (1867–1938). The publication of this series has been made possible by the extremely generous support of Robert Temple, and is to be made available free of charge to all SHAC members.

The series is under the general editorship of Professor Lawrence M. Principe (Johns Hopkins University) and Dr. Jennifer M. Rampling (University of Cambridge). The international editorial board is comprised of Professor Charles Burnett (Warburg Institute), Dr. Michèle Mertens (Université de Liège) and Professor Cristina Viano (CNRS, Paris).

The *Sources of Alchemy and Chemistry* relies on the work of an international group of scholars working to edit and translate early texts. This work is facilitated by a series of annual workshops, which bring together specialists in Greek, Coptic, Syriac, Arabic, Hebrew and Latin alchemy to share their expertise and critique one another's work. For a report on this year's workshop, see below under the Reports section.

The first monograph in the series has now been sent to SHAC members with the first issue of *Ambix* 2014. It contains one of the earliest known chemical texts: the *Four Books of Pseudo-Democritus*, edited by Dr Matteo Martelli (Berlin) [http://maneypublishing.com/index.php/books/the\\_four\\_books\\_of\\_pseudo-democritus/](http://maneypublishing.com/index.php/books/the_four_books_of_pseudo-democritus/). Martelli has presented not only a fresh edition and translation of the surviving Greek fragments, but also, for the first time, additional materials preserved in Syriac. The volume also presents important examples of the medieval and early modern reception of these writings, including the dialogue of Synesius and Dioscorus – the most influential Byzantine commentary on the *Four Books* – and previously unpublished Latin translations of both the *Four Books* and Synesius' commentary made by Matthaëus Zuber in 1606. Accompanied by a full introduction and commentary, these sources offer new and significant insights into the world of ancient chemistry: practical recipes and lists of ingredients, clues to the doctrinal content of ancient alchemy, and early hints of a tradition that linked the alchemist 'Democritus' to the wisdom of Egypt and Persia.

### **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.

#### **Isis in Transition**

Isis will move to the Descartes Centre at Utrecht University on July 1st. The editor in chief for the next five years will be H. Floris Cohen, professor of comparative history of science and former chairman of the Descartes Centre for the History and Philosophy of the Sciences and the Humanities at Utrecht University. You can learn more about him at <http://www.hfcohen.com/>.

Isis' move to the Descartes Centre is financially supported by Utrecht University, the Ammodo Foundation, The Huygens Institute for the History of the Netherlands in The Hague, and Museum Boerhaave in Leyden. The Isis office at York University, Toronto, Canada will shut down on June 17, and will open



again at the Descartes Center, Utrecht University, Netherlands on July 7. After July 7, messages may be sent to [ISISJournal@uu.nl](mailto:ISISJournal@uu.nl) and will be answered by the new editorial office.

### **Reflecting on a Century of Scholarship: The Five Most Influential *Isis* Articles Ever Published**

In celebration of the centenary of the publication of *Isis*, readers were asked to vote on the top five articles that have appeared since the journal started in 1913 with George Sarton at the helm. The articles voted into the top five spots may come as a surprise. First, they all fall between the years 1961 and 1988. There are no articles from the last twenty-five years, but perhaps that is appropriate if we are to think of the top five as classics in the field. However, it is interesting there are no representatives from the first fifty years of the journal. Second, the majority of the articles deal with the early modern, not the modern, period. It is a reminder of the exciting work done over the years on the early modern period and the continuing importance that this area will play in the future. Finally, there is a heavy emphasis in these five pieces on the physical sciences. Not one of the articles focuses on the history of biology, which is such a dominant force in our field at present. But the names of the authors will come as no surprise—they are among the most influential historians of science of the past fifty years.

1. The House of Experiment in Seventeenth-Century England, Steven Shapin. Volume 79, Number 3, September 1988, <http://www.jstor.org/stable/234672>
  2. Totius in Verba: Rhetoric and Authority in the Early Royal Society. Peter Dear. Volume 76, Number 2, June 1985, <http://www.jstor.org/stable/231744>
  3. The Function of Measurement in Modern Physical Science. Thomas S. Kuhn. Volume 52, Number 2, June 1961, <http://www.jstor.org/stable/228678>
  4. Scientific Internationalism and the Weimar Physicists: The Ideology and Its Manipulation after World War I. Paul Forman. Volume 64, Number 2, June 1973, <http://www.jstor.org/stable/229595>
  5. Laboratory Design and the Aim of Science: Andreas Libavius versus Tycho Brahe. Owen Hannaway. Volume 77, Number 4, December 1986, <http://www.jstor.org/stable/233163>
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# Final Program

## HIST

### DIVISION OF THE HISTORY OF CHEMISTRY

S. C. Rasmussen, *Program Chair*

#### SUNDAY MORNING

Section A

InterContinental San Francisco - Twin Peaks

#### HIST Tutorial and General Papers

S. C. Rasmussen, *Organizer*

J. Jeffers, *Presiding*

**8:30 1.** HIST Tutorial: Impact of World War I on chemistry, physics, and astronomy. **V. Trimble**

**9:10 2.** J.W. Baker's pioneering undergraduate course in physical organic chemistry. **M. D. Saltzman**

**9:40 3.** "Charles Hampton, Research Chemist": Did this book attract young adults to careers in chemistry?  
**E. T. Strom**

**10:10** Intermission.

**10:25 4.** Accuracy of dates in chemical historiography: the curious case of the 19th-century French chemist Auguste Laurent – a clarification. **J. Gal**

**10:55 5.** Rise, fall, and fine print of Erlenmeyer's Rule. **R. Hudson**

**11:25 6.** Polypyrrole: The first conducting organic polymer. **S. C. Rasmussen**

#### SUNDAY AFTERNOON

Section A

InterContinental San Francisco - Twin Peaks

#### Symposium on the HIST Citation for Chemical Breakthrough Award Program

J. Seeman, *Organizer, Presiding*

**1:00** Introductory Remarks.

**1:10 7.** History of HIST Awards. **G. D. Patterson**

**1:40 8.** Past, present and future of the Citation for Chemical Breakthrough Award program. **J. I. Seeman**

**2:10 9.** Citation for Chemical Breakthrough (CCB) awards, 2012: Choosing Louis Pasteur's award-winning publication. **J. Gal**

**2:40 10.** Isotopes: Identifying the breakthrough publication. **C. J. Giunta**

**3:10** Intermission.

**3:25 11.** Russian or German? First or fourth? The Citation for Chemical Breakthroughs award to St. Petersburg State University for Mendeleev's periodic system of the elements. **D. E. Lewis**

**3:55 12.** Charles M. Hall's patent for refining aluminum metal by electrolysis. **N. C. Craig**

**4:25 13.** Gomberg, Schlenk, and Free Radicals: An Unknown Discovery and Belated Breakthrough. **T. T. Tidwell**

## SUNDAY EVENING

InterContinental San Francisco - Russian Hill

**5:00 - 8:00 HIST Executive Committee Meeting**

## MONDAY MORNING

Section A

InterContinental San Francisco - Grand Ballroom C

**8:00 - 8:30 HIST Business Meeting**

### **Found and Lost: Incredible Tales of Spurious, Erroneous and Rehabilitated Elements**

Cosponsored by INOR

M. Fontani, *Organizer*

M. Orna, *Organizer, Presiding*

**8:30 14.** Found and lost: Incredible tales of spurious, erroneous and rehabilitated elements, an overview. **M. Orna**

**8:45 15.** Florentium: The metal of the Florentines. **M. Fontani**, M. Costa

**9:05 16.** Charles James: His efforts to identify element #61. **A. Greenberg**

**9:25 17.** B Smith Hopkins and the Discovery of "Illinium," Element 61. **V. V. Mainz**, G. S. Girolami

**9:45 18.** Legend of vestium. **J. L. Marshall**, V. R. Marshall

**10:15** Intermission.

**10:30 19.** Vexed story of element 72 - hafnium. **E. Scerri**

**11:00 20.** Disappearing spoon: Ghost elements. **S. Kean**

### **The Role of the Chemical Technician through the Decades**

Sponsored by I&EC, Cosponsored by CTA and HIST

## MONDAY AFTERNOON

Section A

InterContinental San Francisco - Grand Ballroom C

### **Found and Lost: Incredible Tales of Spurious, Erroneous and Rehabilitated Elements**

Cosponsored by INOR

M. Orna, *Organizer*

M. Fontani, *Organizer, Presiding*

**1:15** Introductory Remarks.

**1:20 21.** Emanations and isotopes. **C. J. Giunta**

**1:45 22.** Discoveries of real and imaginary elements by astronomical methods. **V. Trimble**

**2:10 23.** Undiscovery of erythronium. **J. L. Marshall**, V. R. Marshall

**2:35 24.** Controversy of Lucium- the first patented "element". **K. K. Walker**, B. D. Kaissi

**3:00** Intermission.

**3:15 25.** Twilight of the naturally occurring elements: Moldavium, sequanium, and dor. **M. Fontani**

**3:45 26.** Found, lost and found again? The story of element 43. **B. Van Tiggelen**

**4:10 27.** Even ACS Presidents announced the discovery of new elements and were wrong. **J. M. Hayes**, P. L. Perez

**4:35 28.** A philatelic tribute to elements found and lost. **D. Rabinovich**

## MONDAY EVENING

Section A

InterContinental San Francisco - Telegraph Hill

**5:15 - 6:30** *Lost Elements Reception*

Moscone Center, North Bldg. - Hall D

### Sci-Mix

S. C. Rasmussen, *Organizer*

**8:00 - 10:00**

**17, 21.** See previous listings.

**46.** See subsequent listings.

## TUESDAY MORNING

Section A

Moscone West - Room 3002

### Science and Legacy of Attila Pavlath

J. Hayes, *Organizer, Presiding*

**8:00** Introductory Remarks.

**8:10 29.** Dr. Attila Pavlath and the California Section of the American Chemical Society. **P. F. Vartanian**

**8:40 30.** Promoting public image for chemistry: Attila Pavlath's contribution to ACS's international recognition. **F. Darvas**

**9:10 31.** Survivors' tales: ACS staff recollections of a super active president. **F. E. Walworth**

**9:40** Intermission.

**9:55 32.** Brief summary of Dr. Attila Pavlath at the USDA Western Regional Research Laboratory. **J. W. Finley**

**10:25 33.** Attila Pavlath: Leader, Mentor, Scientist and Friend. **E. A. Nalley**

**10:55 34.** Always a pioneer: sic itur ad astra! **G. A. Pavlath**

**11:25 35.** Reflections on my life. **A. E. Pavlath**

### Women Leaders of the Global Chemistry Enterprise

Sponsored by WCC, Cosponsored by HIST, IAC, PRES, and PROF

## TUESDAY AFTERNOON

Section A

InterContinental San Francisco - Twin Peaks

### HIST Award Symposium Honoring Ernst Homburg

P. Morris, *Organizer*

G. Patterson, *Organizer, Presiding*

**1:00** Introductory Remarks.

**1:05 36.** The chemist and the laboratory. **P. Morris**

**1:35 37.** Women chemists in 18th century France, with an emphasis on Madame d'Arconville. **B. van Tiggelen**

**2:05 38.** 'Science versus practice' and the German chemist ca. 1860: Erlenmeyer in context. **A. Rocke**

**2:35 39.** Identities in the twentieth century. **C. Reinhardt**

**3:05 Intermission.**

**3:20 40.** Chemists in American industry between the world wars. **J. K. Smith**

**3:50 41.** Patents, powders, profits: the significance of the patent infringement trial, Nobel's Explosives Co. v. Anderson (1894). **S. Mauskopf**

**4:20 42.** Chemists and chemical societies, 1500-1900. **E. Homburg**

**5:20** Concluding Remarks.

### **Women Leaders of the Global Chemistry Enterprise**

Sponsored by WCC, Cosponsored by HIST, IAC, PRES, and PROF

## **TUESDAY EVENING**

**7:00 - 9:00 2014 HIST Award Banquet** - Far East Cafe - 631 Grant Avenue, San Francisco, CA 94108  
[Tickets may be purchased from Vera Mainz, HIST Secretary-Treasurer]

## **WEDNESDAY MORNING**

Section A

InterContinental San Francisco - Twin Peaks

### **General Papers**

S. C. Rasmussen, *Organizer, Presiding*

**8:30 43.** New approaches to exploring the history of chemistry through the visual arts. **D. B. Cordes**

**9:00 44.** Alchemy in India. **S. Saha, B. B. Saha**

**9:30 45.** Near Neighbors: sulfuric acid producers and petroleum refineries in 19th century New York City. **P. Spellane**

**10:00** Intermission.

**10:15 46.** Modern chemical warfare: history, chemistry, morality – a recollection and reflection at the centenary of World War I. **J. Gal**

**10:45 47.** ORGN's website: A resource for the study of the history of chemistry and an inspiration to study the history of chemistry. **B. J. Myers, E. E. Fenlon**

**11:15 48.** History and Development of the Reaction Mechanisms Conference. **E. E. Fenlon, B. J. Myers, T. T. Tidwell**

### **What Does 20th Century Physical Chemistry Have To Say To 21st Century Physical Chemists?**

Sponsored by PHYS, Cosponsored by HIST

## **WEDNESDAY MORNING**

Section A

### **The IUPAC Solubility Data Series: 100 Volumes of Solubility Data Online**

Sponsored by CINF, Cosponsored by ANYL and HIST

### **What Does 20th Century Physical Chemistry Have To Say To 21st Century Physical Chemists?**

Sponsored by PHYS, Cosponsored by HIST



## HIST 1 - HIST Tutorial: Impact of World War I on chemistry, physics, and astronomy

**Virginia Trimble**, [vtrimble@astro.umd.edu](mailto:vtrimble@astro.umd.edu). Department of Physics & Astronomy, University of California, Irvine & LCOGT, Irvine, CA 92697, United States

A World War II has been called "The Physicists' War," meaning radar, rockets, and atomic bombs. WWI was, somewhat similarly, "The chemists' war," and we meet nearly on the centenary of the Guns of August. Sadly, perhaps, most people will think first of poison gases, and indeed Fritz Haber was the one German scientist whom Lord Rutherford never forgave and never spoke to again. But they caused less than 1% of the deaths, and other chemistry was probably more important. Both sides had to learn to fix nitrogen, for fertilizers as well as for explosives, to replace guano shipped from South America. The Brits and other allies were used to relying on German dyestuffs and optical glass, while the Germans had to replace most of the petroleum they had been importing. Large scale production of synthetic rubber, anti-microbials, and other products of the chemists' art also received major boosts. And, like the bomb, it was not possible for humanity to forget how to make all these once they had learned how. I will also say something about the Great War's effects on physics and astronomy. Whether WWII will be the biologists' war or the information technologists' war is not clear, though we all surely hope not in the lifetimes of anyone here.

## HIST 2 - J.W. Baker's pioneering undergraduate course in physical organic chemistry

**Martin D Saltzman**, [msaltzm@providence.edu](mailto:msaltzm@providence.edu). Department of Chemistry, Providence College, Providence, RI 02918, United States

John William Baker (1898-1967) was one of a group of pioneering physical organic chemist in Great Britain who laid the ground work for the great strides that were in the post-World War II era in this discipline. A student of J. T. Thorpe and C. K. Ingold at Imperial College, he received his Ph.D. in 1925. When Ingold became Professor of Organic Chemistry at Leeds University, Baker was one of the first persons he added to the staff. Ingold had the intention of reforming the way in which organic chemistry was taught to undergraduates. Instead of rote memorization Ingold sought to take a mechanistic approach. Baker was an enthusiastic follower of Ingold's approach and when Ingold left Leeds to take up the professorship at University College, London Baker continued what Ingold had started and elaborated upon it. This paper will examine a course given by Baker in the 1941-42 academic year to third year chemistry students. These notes were taken by Donald Vincent a student in the course and are now in the archives of Leeds University. After reviewing the contents of the course from the notes, I will try to show how this course was an anticipation of Ingold's Structure and Mechanism in Organic Chemistry which was first published in 1951.

## HIST 3 - Charles Hampton, Research Chemist: Did this book attract young adults to careers in chemistry?

**E Thomas Strom**, [tomstrom@juno.com](mailto:tomstrom@juno.com). Department of Chemistry and Biochemistry, University of Texas at Arlington, Arlington, TX 76019-0065, United States

In 1942 Dodd and Mead published the book "Charles Hampton, Research Chemist" by Arthur W. Kenney and Stephen C. Kenney. This book was part of the series of Dodd Mead Career Books written for young adults. This book on a research chemist was one of a very few dealing with scientific careers. This novel will be evaluated from the perspective of whether it gave a realistic view of an industrial chemistry career.

## HIST 4 - Accuracy of dates in chemical historiography: The curious case of the 19th-century French chemist, Auguste Laurent, a clarification

**Joseph Gal**, [joe.gal@ucdenver.edu](mailto:joe.gal@ucdenver.edu). Department of Medicine and Department of Pathology, University of Colorado School of Medicine, Aurora, Colorado 80045, United States

In historiography, accuracy in dates is essential, yet, as the literature shows, inaccurate dates are common, for several reasons. A particularly problematic example concerns Augustin ("Auguste") Laurent, one of the most important chemists of the 19th century. Different dates for his birth have persisted in the literature since the 1890s.

Many sources give 1807 or specifically November 14th, 1807, for his birth, e.g., Wurtz in 1862; Tiffeneau, 1918; Jacques, 1953; Kapoor (DSB), 1973; Fournier, 2009; etc. However, many other sources give 1808 or specifically September 14th, 1808, e.g., French chemist/historian Édouard Grimaux, 1896; Leicester, 1956; Partington (A History of Chemistry), 1964; Brock (Norton History of Chemistry), 1992; Bensaude-Vincent, 2003; etc. Indeed, eminent historians of chemistry appear on either side of the 1807/1808 conflict. Moreover, some have given one of the dates at one time and the other at another time. For Laurent's death in 1853, April 5th (Grimal, 1958), 15th (many sources), and 23rd (Grimaux, 1896; Findlay, 1937; others) have been claimed. To resolve the discrepancies, archival sources were examined. Laurent's birth certificate (Archives Départementales, Haute-Marne) indicates November 14th, 1807, for birthdate; his death certificate [Archives numéri-sées de Paris, État civil reconstitué (XVI<sup>e</sup> siècle - 1859)] provides April 15th, 1853, for his death. These archival dates agree with declarations by Laurent's widow Francine (née Schrobilgen, 1820-1914), son Hermann (a noted mathematician, 1841-1908), and Jérôme Nicklès (1821-1869), a chemist friend who was at Laurent's side to the end. Conclusion: Auguste Laurent was born November 14th, 1807, and died April 15th, 1853.

## HIST 5 - Rise, fall, and fine print of Erlenmeyer's rule

**Reggie Hudson**, [reggie.hudson@nasa.gov](mailto:reggie.hudson@nasa.gov). Astrochemistry Laboratory, NASA Goddard Space Flight Center, United States

The name of Emil Erlenmeyer (1825 - 1909) is synonymous with the flask that he invented, but it also appears to have been Erlenmeyer who first noted that aldehydes are made readily by the hydration of alkynes. In the United States, this reaction was part of the PhD research of Julius Nieuwland (1878 - 1936) at the Catholic University of America, before Nieuwland began his long scientific career at Notre Dame. Both investigators concluded that the result of alkyne hydration is not the expected alcohol, but rather the isomeric aldehyde, a conclusion termed Erlenmeyer's rule. This presentation will focus on the prototypical Erlenmeyer-Nieuwland product, the elusive vinyl alcohol,  $\text{H}_2\text{C}=\text{CH}(\text{OH})$ . The author's research has played a role in the modification of Erlenmeyer's rule, and has helped to confirm a prediction of the young Julius Nieuwland.

## HIST 6 - Polypyrrole: The first conducting organic polymer

**Seth C Rasmussen**, [seth.rasmussen@ndsu.edu](mailto:seth.rasmussen@ndsu.edu). Department of Chemistry and Biochemistry, North Dakota State University, Fargo, ND, United States

The discovery that the conductivity of conjugated organic polymers can be controlled via redox processes has led to materials that combine the electronic properties of inorganic semiconductors with the weight and density of plastics. As such, these materials have been studied extensively and their importance recognized with the awarding of the 2000 Nobel Prize in chemistry to Alan Heeger, Alan MacDiarmid, and Hideki Shirakawa. This award stemmed from their work on conducting polyacetylene via doping with oxidants, which they carried out in the late 1970s. While these studies produced the most dramatic results, investigations of conjugated polymeric materials date back to the early 1960s, with the first organic polymer of significant conductivity being polypyrrole as reported by Donald Weiss and coworkers in Australia. The development of polypyrrole materials will be presented beginning with the first report of pyrrole's polymerization in 1922 through the more well-known work of Diaz and coworkers in 1979.

## HIST 7 - History of HIST Awards

**Gary D Patterson**, [gp9a@andrew.cmu.edu](mailto:gp9a@andrew.cmu.edu). Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA 15213, United States

Every voluntary human organization eventually reaches the point where there is a desire to honor certain of its members. HIST was conceived as an interest group by Edgar Fahs Smith and Charles Brown, but it was the work of Lyman Newell that raised it to the status of a Division of the American Chemical Society in 1926. While many fine Chairmen served the Division, it was the Secretary-Treasurers that provided continuity. One of the most notable Secretaries (1948-1965) was Sidney M. Edelstein, the founder and President of the Dexter Chemical Company. He provided both vision and money to support an award for "Outstanding Achievement in the History of Chemistry" and named it the "Dexter Award." When Edelstein died (1994), the financial future of the Award was uncertain, and in 2002 the funding source changed and the Award was named for Sidney M. Edelstein. Eventually, this temporary arrangement failed and the Award went into lapse. It has now been restored as the HIST Award for Outstanding Achievement in the History of Chemistry (2012-). Once many articles had been published in the

*Bulletin for the History of Chemistry*, the desire to celebrate the best articles grew. The Best Paper Award was started by the editor William Jensen in 1989. James J. Bohning was the first winner. Eventually the vision of HIST included all world chemistry. Jeffrey Seeman proposed that HIST sponsor an award that recognized seminal papers in the history of chemistry, the HIST Citation for Chemical Breakthrough Award. He will discuss this program in detail following.

## **HIST 8 - Past, present, and future of the Citation for Chemical Breakthrough Award program**

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The Citation for Chemical Breakthrough Award were first presented in 2006. As of 2013, 40 awards have been issued around the world. A summary of the program will be given, including spectacular highlights as well as unforeseen challenges. A view to the future of the program will also be presented.

## **HIST 9 - Citation for Chemical Breakthrough (CCB) awards, 2012: Choosing Louis Pasteur's award-winning publication**

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A CCB award for 2012 was made by the Division of the History of Chemistry to the École normale supérieure (ENS), a prestigious university-level institution in Paris where Pasteur discovered molecular chirality in 1848. The award requires choosing the most relevant publication by the discoverer, and in Pasteur's case three articles were contenders: his brief first announcement of the discovery in May 1848 to the French Academy of Sciences; his full paper on the work, also published in 1848; and the 1861 publication of his famous two lectures to the Chemical Society of Paris in 1860 on the discovery. The choice was difficult since each of the three publications has unique elements and strengths. Thus, the May 1848 article had the merit of being first; it is concise and not burdened with specialized experimental and theoretical details and was therefore widely comprehensible. The full paper in 1848 on the other hand had the merit of providing the scientific and experimental details needed for the full description and appreciation of the discovery. The lectures of 1860 stand as a sweeping and grand narrative of the discovery, including its background and its broader implications for chemistry and biology. Taking all of these considerations into account, the decision was reached that Pasteur's May 1848 paper best meets the CCB criteria for the winning publication. It was a stunning first and succinct announcement of a hitherto-unheard-of but clearly vital phenomenon with far-reaching implications. The award ceremony was held at the ENS in October 2013.

## **HIST 10 - Isotopes: Identifying the breakthrough publication**

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Selection of the isotope concept for a Citation for Chemical Breakthrough award in 2013 presented both the dilemma of selecting the most appropriate publication to honor and the opportunity for reflection on the nature of this discovery and of scientific discovery more generally. Several findings in the early years of the twentieth centuries led Frederick Soddy to introduce the term isotope (a word suggested by classics scholar Margaret Todd) for varieties of the same element that have different atomic masses. The public birthday of the term is well established: it was first published in the Dec. 4, 1913, issue of *Nature*. The public debut of the concept, however, is much more difficult to date. Plausible candidates will be reviewed, from the recognition of distinct but chemically inseparable "radioelements," to the elucidation of the pathways of radioactive decay collectively organized under the law of radioactive displacement, to the adoption of atomic number rather than atomic weight as the organizing principle of the periodic table.

## **HIST 11 - Russian or German? First or fourth? The Citation for Chemical Breakthroughs award to St. Petersburg State University for Mendeleev's periodic system of the elements**

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Mendeleev's periodic system of the elements first appeared in Russian, in his book, *Osnovy khimii* [Elements of Chemistry], published in February, 1869, and it was immediately abstracted into German in the *Zeitschrift für Chemie*. It also appeared in two papers (1869, 1870) in the *Zhurnal Russkago Fiziko-Khimicheskago Obshchestva*, and finally, as the German translation of the 1870 *Zhurnal* paper in *Liebigs Annalen der Chemie*. The process of deciding which of these competing candidates should be recognized as the breakthrough paper will be discussed, and a brief account of the presentation ceremony at St. Petersburg State University on October 31, 2013, will be given.

## **HIST 12 - Charles M. Hall's patent for refining aluminum metal by electrolysis**

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On a single day, April 2, 1889, Charles M. Hall was awarded five patents for his discovery of the electrolysis process for extracting aluminum metal from aluminum oxide. To honor and celebrate Hall's breakthrough discovery under the CCB program of the Division of the History of Chemistry, it was necessary to identify which of the patents disclosed the breakthrough method. All five patents were carefully reviewed, as were the circumstances of the applications for the patents. As part of this evaluation, the question of why so many patents arose. Was more at stake than an inventor attempting to make the patent claims as broad as possible? The evidence reveals that problems with the original process on the small scale propelled Hall's determined investigation of alternative formulations of electrolyte baths and of different cell designs. Based on this analysis, one of the five patents was signaled out and was honored by the CCB award.

## **HIST 13 - Gomberg, Schlenk, and free radicals: An unknown discovery and belated breakthrough**

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Moses Gomberg is widely and correctly acclaimed for his breakthrough discovery of the triphenylmethyl radical, although this was originally the object of dispute until validation by Schlenk's synthesis of an isolable triarylmethyl radical in 1910. These discoveries however were not recognized by the award of the Nobel Prize to Gomberg and Schlenk, for reasons documented by the late Lennart Ebersson as due to confused policies and prejudice on the part of the Nobel Committee. Overlooked in this debate was an earlier clear and correct report of the discovery free radicals from 1879, unknown to historians of chemistry until 2013 (*Nature Chem.* 2013, 637).

## **HIST 14 - Found and lost: Incredible tales of spurious, erroneous, and rehabilitated elements, an overview**

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At last count, there are historically many more elements that never made it into the Periodic Table than those that did. The concept of "element" evolved over the centuries, eventually allowing chemists to distinguish simple bodies from compounds on a theoretical basis. Eventually, launched by Bunsen and Kirchhoff's work, identifying new elements by spectroscopy was all the rage, and it was easy to "discover" a new element because new lines, or a new combination of lines, appeared everywhere in the spectrum (and gave particularly novel "pat-terns" in mixtures of already known elements). Three major developments gave rise, in their turn, to a resolution of the false discoveries that dogged the footsteps of chemists even into the mid-20th century: the periodic table, atomic number, and the discovery of isotopes. The first was an organizational tool that allowed chemists to realize for the first time that elements had their "place;" the second placed a limit on the number of elements based on the number of nuclear protons; the third resolved the puzzle over new elements in radioactive decay products. This

symposium will take a close look at some erroneous discoveries, the lessons to be learned, and how they were resolved based upon new knowledge.

## **HIST 15 - Florentium: The metal of the Florentines**

**Marco Fontani**, [marco.fontani@unifi.it](mailto:marco.fontani@unifi.it), Mariagrazia Costa. Department of Chemistry, University of Florence, Florence, Tuscany 50134, Italy

Even up to the end of the 1920s, the name "salts of commercial didymium" was used to indicate the mixture of the elements of the rare earths that, after a crude removal of cerium were present in monazite sands. It was precisely by starting with these "didymium earths" that Luigi Rolla (1882-1960) and Lorenzo Fernandes (1902-1977), in 1922, undertook an immense investigation in a search directed at the isolation of element 61, which they dubbed florentium. Despite the heroic and dramatic efforts on their part to isolate this elusive element, including about 52,000 fractional crystallizations alone on tons of commercial didymium, the little florentium they thought they had found was subsequently discredited. Element 61, with isotopic half-lives considerably shorter than the age of the earth, was not present in rare-earth minerals in any detectable amount.

## **HIST 16 - Charles James: His efforts to identify element #61**

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Charles James (b. England, 1880) studied chemistry at the University of London with William Ramsay (Nobel Prize in Chemistry, 1904), who would remain his inspiration and friend. He arrived in the United States in 1906 accepting a position with the National Refining Company in West Chester, PA. However, he was almost immediately recruited by Charles Parsons to the New Hampshire College of Agriculture and Mechanical Arts in Durham, N.H. (in 1923 the University of New Hampshire). James's research in Durham was focused on the rare earths and he was a contributor to the discovery of lutetium. In 1912, The gap in atomic weights had Ramsay suggesting to James that there was a missing element between neodymium and samarium. Following the discovery of atomic numbers by Henry Moseley in 1913, in the 1920s the search for element #61 gained momentum. As it turned out, James was "scooped" by B. Smith Hopkins, at the University of Illinois who named the "new element" ilium. However, it was only in 1947 that definitive proof of element #61, promethium, a radioactive by-product of the explosion of the atomic bomb, was published. The present talk will describe aspects of James's studies dedicated to the discovery of element #61.

## **HIST 17 - B. Smith Hopkins and the discovery of "illinium", Element 61**

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Born in Owosso, Mich., Hopkins began teaching in the Menominee, Mich., public schools in 1897. He received a Ph.D. in 1906 with H. N. Morse at Johns Hopkins University and then held various academic posts before joining the Illinois faculty in 1912. At Illinois, Hopkins worked with Charles Balke, who was conducting a series of researches on beryllium, yttrium, columbium (now called niobium), tantalum, and the rare earths. When Balke left Illinois in 1916, Hopkins carried on this research, specializing more and more in the chemistry of the rare earths. This was the field in which he made his greatest contributions to chemistry.

At that time, separating rare earths from each other was a long and tedious process, depending on repeated recrystallizations of the double magnesium nitrates, the bromates, and other salts. In some cases, thousands of recrystallizations were necessary. In 1926, Hopkins with Leonard Yntema and J. Allen Harris announced the discovery of the long sought element 61, which they named "illinium." Repeated attempts failed to concentrate this element any further, and with the development of fission reaction, it was determined that element 61 (now known as promethium) was highly radioactive. Most chemists concluded that it did not exist in nature. Hopkins had considered the discovery of illinium the climax of his career, and was bitterly disappointed that his work was not accepted. But his contributions to rare earth chemistry were significant and laid the groundwork for much subsequent research.



## HIST 18 - Legend of vestium

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The history of the putative element "vestium," which was described by the Polish scientist Jędrzej Sniadecki in 1808, is reviewed. Over a century later, some have claimed vestium was actually ruthenium; therefore, the discovery of ruthenium should be credited to Sniadecki rather than to Karl Ernst Klaus, the historically accepted discoverer in 1844. To evaluate this claim, the authors have repeated the chemistry in the laboratory, showing that it is impossible that vestium is ruthenium. In this presentation, photographs of the laboratory experimental results are included, which suggest strongly that Sniadecki's vestium was the uncomplexed chloride of palladium.

## HIST 19 - Vexed story of element 72 - hafnium

**Eric Scerri**, [scerri@chem.ucla.edu](mailto:scerri@chem.ucla.edu). Department of Chemistry and Biochemistry, University of California Los Angeles, Los Angeles, CA 90095, United States

The history of the discovery of element 72 that was eventually named hafnium provides perhaps the single most bitterly fought controversy among the discovery of any element. One of the first reports of its discovery was by Georges Urbain from France who eventually took what he believed to be a sample of this element to Henry Moseley in the hope that his claim might be validated. It did not take long for Moseley to show that Urbain's new element was spurious. About ten years later Hevesy and Coster working in the Neils Bohr Institute in Copenhagen announced that they had discovered the real element 72. At this point Urbain revived his claim and was supported by the British and French press, both scientific and popular. What followed can only be described as a comical priority dispute driven entirely by nationalism. The British did not hide the fact that they supported the French claim of Urbain because the British and the French had been allies during the Great War. Another controversial aspect of this element was the extent to which its discovery was helped by Bohr's quantum mechanical account of the structure of atoms. The popular account has it that Bohr directed Hevesy and Coster to look for the new element in some minerals containing zirconium. Subsequent historical research has shown that this view is untenable.

## HIST 20 - Disappearing spoon: Ghost elements

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How did the simple naming of elements turn into an international incident during the Cold War? Why did technetium get discovered more times than any other element? How has fraud shaped the periodic table? And what three other states (besides California!) very nearly had elements named after them? Some of us had to memorize the periodic table when young, and many of the rest of us know large swaths of it by heart today. But that's only the official table. What about the "lost elements," the ones that didn't quite make it? This talk, based on Sam Kean's *The Disappearing Spoon* - his bestselling book about the hidden stories buried all over the periodic table - explores the woulda, coulda, shoulda of every chemist's favorite chart. Come hear about all the wild elements names, big egos, and heated battles that (almost) made the table what it is today.

## HIST 21 - Emanations and isotopes

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The discovery of radioactivity in 1896 and the ability to detect its ionizing radiation led to an explosion of discoveries of "radioelements" in the final years of the nineteenth century and the first years of the twentieth. Some of these new elements, like radium and polonium, are still to be found on the periodic table. Others, however, are absent or at least hidden. Many of these latter were true discoveries, but not of distinct elements. Rather, we understand them today as isotopes. For example, the three radioactive "emanations" discovered at this time, thorium emanation, radium emanation, and actinium emanation, we now recognize as three isotopes of the element radon. This presentation will describe the discoveries of several radioelements, including the emanations. It will also briefly describe how various groups of these radioelements came to be recognized as varieties of the same element, thereby occupying the same place in the periodic table.

## HIST 22 - Discoveries of real and imaginary elements by astronomical methods

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Helium? Yes, in 1868, by Norman Lockyer, who spotted a yellow line not due to sodium in the spectrum of solar prominences, which he and Pierre Janssen had learned to observe without the need of an eclipse. Acceptance by the chemical community came only after laboratory confirmation by William Ramsay. Technetium? The first natural sample was recognized in 1952 by Paul Merrill in the spectra of a few cool stars. Charles A. Young and William Harkness thought they had identified an element in the solar corona following the 1869 solar eclipse: they dubbed it coronium. Only in 1942 did Bengt Edlén show that this 5303 Å feature came from iron atoms deprived of 13 electrons. The corona is hot, though chemically normal. Nebulium? The Oxford English Dictionary credits the word to William Crookes, who was a chemist and should have known better, in his 1898 address to the British Association for the Advancement of Science, though the strongest line had actually been seen by William Huggins in the Orion nebula long before. Lockyer thought Mg was to blame. The right answer came in 1928 from physicist Ira Bowen (later director of the Mount Wilson and Palomar Observatories). Twice-ionized oxygen is responsible for the strongest emission lines (O and N for others), the very low density of interstellar gas permitting forbidden radiative decays from levels that would be depopulated by collisions in terrestrial samples. Shorter-lived were asterium, aldebaranium, and others. And the less said about whether potassium flares smoke, the better!

## HIST 23 - Undiscovery of erythronium

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Don Andrès Manuel del Río in 1801 claimed he discovered a new element from the mines of Zimapán, Mexico, which he named "erythronium." Four years later, this claim was investigated in Paris by Hippolyte Victor Collet-Descotils, who identified the "new element" as chromium, which had been discovered earlier (1797) by Nicolas-Louis Vauquelin. In 1831 Nils Sefström in Sweden discovered vanadium, which was soon recognized as del Río's erythronium. The authors have returned to the laboratory to repeat the experiments of Descotils in an attempt to determine whether or not his "undiscovery" of erythronium was justified. Photographs of these laboratory studies are included in the presentation.

## HIST 24 - Controversy of lucium - the first patented "element"

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Lucium, the first patented element, was first reported by Prosper Barrière in March of 1895. After news of the discovery was published by Sir William Crookes in Chemical News in 1896, controversy ensued: prominent scientists were incorrectly linked with experiments performed to verify the presence of the new element in the article published by Crookes, and ultimately the "element" lucium was proven not to be a new element at all by July of 1897. It was determined that lucium, instead of being a new element, was in fact an impure sample of yttrium.

## HIST 25 - Twilight of the naturally occurring elements: Moldavium, sequanium, and dor

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The more the vacant boxes in the periodic table diminished, the more scientists increased their efforts in the attempt to identify the elements still missing; the techniques used became more and more sophisticated, but the elements seemed more elusive and difficult to find. Despite the risk of reporting false discoveries, the number of announcements increased and scientific journals received many papers that endowed many fanciful names on elements 85, 87 and 93. In Paris two spectroscopists were looking for the presence, in nature, of these 3 elements. Yvette Cauchois (1908-1999) - who created a curved crystal focusing X-ray spectrograph, a highly sensitive, high-resolution instrument - with the aid of her colleague, Romanian Horia Hulubei (1896-1972), reported a doublet of weak X-ray lines which they assumed were element 87. In 1939 they found evidence for the existence of eka-rhenium. Although they were supported by their patron, Jean Perrin (1870-1942), the "discoveries" did not receive experimental confirmation outside of France. Finally Hulubei and Cauchois observed

unknown lines in the emission spectrum of radon, some of which could indicate the presence of eka-iodine among the disintegration products of this noble gas. They prematurely announced these discoveries and named these elements: moldavium (Ml), sequanium (Sq) and dor (Do). By the end of the 1940s, solid confirmations of their existence by other workers bestowed on them their final names: francium, neptunium and astatine and the elements proposed by the French-Romanian team became illegal squatters in the Periodic Table.

## HIST 26 - Found, lost, and found again? The story of element 43

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Once the predictive power of the periodic system became fully acknowledged by chemists, some elements were identified as “missing” for there was a box to be filled. Element 43 was one of them. Since it was a radioelement, it escaped, for a while, the isolation strategies used before the use of nuclear methods, such as the cyclotron. Indeed, 43 was claimed to be discovered many times, one of the last chapters in this saga being the claim made by Walter and Ida Noddack.

The Noddacks' claim was taken seriously at first, since they also had isolated element 75, which was indeed confirmed and called rhenium. Yet, masurium, as they named 43, could not be observed by other chemists, and only after Emilio Segrè and Carlo Perrier had produced the first known isotopes of 43, was technetium eventually accepted to fill in the gap below manganese.

The Noddacks however did not despair of one day isolating what they called “natural element 43.” This paper will show how they situated their own discovery and the later failure, based on original material found in their papers kept in Leuven, Belgium. In particular, Walter and Ida Noddack, and other chemists as well, had a slightly different conception of what an element is, compared to insights from the new emerging field of nuclear chemistry. A later attempt to isolate another unknown element will shed light on their practice and beliefs.

## HIST 27 - Even ACS Presidents announced the discovery of new elements and were wrong

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Three early ACS Presidents are among the group of respected chemists who announced the discovery of new elements that were later not verified. This presentation will share first the stories of Frederick Genth and Charles Frederick Chandler supposedly isolating a new element from platinum ores. Then we will share the work of John Lawrence Smith supposedly finding mosandrium, rogerium, and columbium. All three of these chemists went on to successful careers and service as ACS Presidents, but were not successful as discoverers of “new” elements.

## HIST 28 - Philatelic tribute to elements found and lost

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What do the English potter Josiah Wedgwood (1730-1795), the German chemist Wilhelm Lampadius (1772-1842), and Italian physicist Enrico Fermi (1901-1954) have in common? It turns out that these accomplished individuals share the ignominy of having made claims of discovery for spurious elements, i.e., those that were subsequently found to be known chemical elements, compounds, or a combination thereof. Such is the case of the putative “elements” sydneya, wodanium, and ausonium, described respectively by Wedgwood, Lampadius, and Fermi. This presentation will use postage stamps and other philatelic materials to relate the rise and demise of selected still-born elements, as Berzelius also called them. Interestingly, Berzelius himself, for all his fame and fortune, also had a couple of misses, including his purported isolation of gahnium (1803), a substance later proved to be zinc oxide.



## **HIST 29 - Dr. Attila Pavlath and the California Section of the American Chemical Society**

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Dr. Attila Pavlath has been an integral part of the California Section of the American Chemical Society for over 45 years. He did not start out being active in the Section activities, but after several years of being a dues paying member of the Section, he became assistant treasurer in 1969. From there he became an active participant in both the Section and National American Chemical Society affairs. He has been Chair of the California Section three times over a span of 28 years, active in most of the Section's programs, and the source of many Section and ACS initiatives. He served the Society as President in 2001, the centennial year of the California Section. The main themes underlying his many ACS related activities are how the Section and Society can better serve its chemist and engineer members in their professional careers and how can members bring the excitement of chemistry we all have to the general public for the betterment of society as a whole. Memorable stories from a long and continuing association with the Section and the Society will be described.

## **HIST 30 - Promoting public image for chemistry: Attila Pavlath's contribution to ACS's international recognition**

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Dr. Pavlath's scientific work includes numerous international activities both in research and in providing help to and building cooperation with foreign chemical societies and organizations throughout the world. He is the member of the German and Hungarian Chemical Societies and the Royal Society of Great Britain. He developed cooperation between the ACS and the Association of European Chemical and Molecular Sciences and regularly attended their annual General Assembly throughout Europe which resulted in the regular attendance of the ACS President at their meeting and the invitation of EuCheMS Presidents to ACS meetings.

He participated in the opening of the International Year of Chemistry 2011. He arranged not only the display of the posters in English and French, but also brought about the use of these posters for the celebration of IYC11 worldwide in the appropriate languages. He built strong cooperation between the United States and Japan to share research in agriculture, organized and attended annual meetings for agricultural researchers of the two countries.

After the Cultural Revolution was over, on the invitation of Chinese government he toured China talking to agricultural scientists and delivering lectures to fill them in with new developments. He was and still strongly involved in strengthening the various International ACS Chemistry Chapters and through them cooperation between U.S. and foreign chemists. He was instrumental of the creation of the Hungarian Chapter and helped them to get closer to the ACS.

## **HIST 31 - Survivors' tales: ACS staff recollections of a super active president**

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Immediately upon election to national office, members of the Board of Directors and "presidential succession" (president-elect, president, and immediate past president) begin or in many cases continue to work with staff in a variety of capacities according to their needs and duties. Through the Office of the ACS Secretary, the president works with a staff assistant, who coordinates schedules, arranges travel, makes appointments, assists with official visits to local sections, international chapters, etc., and "other duties as requested." This presentation focuses on the latter, drawing from recollections of staff employed at ACS during Dr. Pavlath's time on the ACS Board of Directors and as President during the Society's 125th Anniversary.

## **HIST 32 - Brief summary of Dr. Attila Pavlath at the USDA Western Regional Research Laboratory**

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Dr. Attila Pavlath's 45 year career at the USDA Western Regional Laboratory has resulted in a multitude of accomplishments that were timely and innovative. Among his accomplishments we will discuss the shrink proofing and soil proofing of wool, the utilization of agricultural products and bio-products for energy, the protection of



produce from moisture loss, discoloration and loss of flavor and new biodegradable food pack-aging materials. Throughout his career Dr. Pavlath's research has focused on improved utilization of agricultural products to meet producer and consumer needs. In those efforts he has cleverly applied state of the art technology to provide practical solutions to needs. The research has resulted in making shrink resistant and wrinkle resistant wool more competitive with synthetic fabrics, use of agricultural waste and by-products as renewable energy sources, coatings for fresh and minimally processed foods to extend shelf life and biodegradable pack-aging materials for foods. Dr. Pavlath has been a thought leader, mentor and thoughtful scientist for his entire illustrious career.

### **HIST 33 - Attila Pavlath: Leader, mentor, scientist, and friend**

*Elizabeth Ann Nalley, [annn@cameron.edu](mailto:annn@cameron.edu). Physical Sciences, Cameron University, Lawton, OK 73505, United States*

Pavlath during his long professional career was an outstanding scientist and a selfless human being who has devoted much of his life to activities to improve our profession and the life of its practitioners. Dr. Pavlath had a career of 60 years in chemistry He is an internationally known scientist. Dr. Pavlath has published extensively during his long distinguished scientific career, even during his working for ten years in a restrictive industrial atmosphere. His accomplishments in chemistry are remarkable in every area. In addition to his 130+ publications, he holds 25 patents. He has received from the Secretary of Agriculture USDA's Technology Transfer Award for carrying out his research from the laboratory to commercial applications and was recently awarded the Spencer Award. For many years, but especially during the last few ones, Dr. Pavlath also worked to improve the public image of chemistry and K-12 science education both domestically and abroad. One of his greatest accomplishments has been his ability to inspire other ACS members to follow him as a leader in improving people's lives through the transforming power of chemistry. This presentation will review the professional accomplishments of Attila Pavlath and will focus on the impact he has had on the leadership of the ACS.

### **HIST 34 - Always a pioneer: Sic itur ad astra!**

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Perhaps it is easier to carve out a narrow scientific area and by sticking to it for a lifetime one can leisurely proceed toward international fame and recognition. However, that was not the nature of the person I am going describe. This presentation is not just my own evaluation of his spirit and driving force during his journey of 60+ years into areas to where only a few if any went before. It is also strongly supported by that of those who worked with him at various stages of his life. The chemistry presented in this talk is secondary. The few references are only given to demonstrate his willingness to attack the unknown. One does not have to be even a chemist to come to that conclusion. As a young chemist he started out on an area where the conventional chemical reactions frequently either did not work or lead to unexpected results. This was fluorine chemistry. He worked with toxic materials, he blew up a few times, but that did not hold him back. He developed new fluorinating agents to create active pesticides, soil proof surfaces and even high-energy solid oxidizers for rocket propulsion. However, he also ventured out toward new areas such as shrink proofing wool or glow discharge chemistry to help the U.S. agriculture. His aim was always what benefit the research could provide for our everyday life. His last effort was even to get to the space, but this remained a dream.

### **HIST 35 - Reflections on my life**

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### **HIST 36 - The chemist and the laboratory**

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The chemist has helped to shape the laboratory over the last four hundred years. What does the changing appearance of the laboratory over this period tell us about the needs and preoccupations of chemists? And how have chemists changed the laboratory? Beginning with the alchemical laboratory of the late 16th century, this paper then examines Lavoisier's laboratory in the 1780s, Liebig's laboratory in the 1830s, Bunsen's in the 1850 and then the chemical palaces of the 1860s and 1870s. After examining the specialised laboratories developed



for industry and government agencies, the paper concludes with the laboratories of the 1960s in Stanford and the very latest laboratories in Oxford.

### **HIST 37 - Women chemists in 18th century France, with an emphasis on Madame d'Arconville**

**Brigitte van Tiggelen**, [vantiggelen@memosciences.be](mailto:vantiggelen@memosciences.be). *Independent Scholar, Louvain-la-neuve, Belgium*

Though a minority, women contributed to the development of chemistry through the centuries, under many roles and disguises: mythical figures, scientific muses, ingenious businesswomen or knowledgeable gentlewomen. In 18th century France, the professionalization of chemistry had not occurred, and academia or university were only one of the many settings of intellectual sociability; women, along with many amateurs, could easily take part in the scientific endeavor, from learning to circulating to producing knowledge. Among the best known figures is Marie-Anne Lavoisier, often depicted as a muse and most able assistant to Antoine-Laurent de Lavoisier, sometimes even claimed to be a chemist in her own right because of her translation work. The same accounts for Claudine Picardet, lover and later wife of Louis-Bernard Guyton de Morveau. The case of Madame d'Arconville is different: while keeping her rank and her obligations as the housewife from the parliamentary bourgeoisie, she was able to connect to a network of relatives and friends that provided her access to up-to-date scientific and medical knowledge. As an active member, she translated and even contributed with her own research. Her works were published anonymously as well as many other pieces and translation in widely different areas such as theater, poetry, philosophy, morals and history. This paper will explore her life and work and contrast them with those of other known French women chemists.

### **HIST 38 - "Science vs. practice" and the German chemist ca. 1860: Erlenmeyer in context**

**Alan Rocke**, [ajr@case.edu](mailto:ajr@case.edu). *Department of History, Case Western Reserve University, Cleveland, OH 44106, United States*

Emil Erlenmeyer is remembered today only as the inventor of his eponymous flask, but he was a central figure in the chemistry of his day. He began his career as a scientifically educated pharmacist, industrial consultant, and professor of applied chemistry, but about 1860 he suddenly re-invented himself as one of the most imaginative and prolific theoreticians in the remarkable early years of the development of structure theory. Then in 1868 he returned to his roots, accepting a professorship at the Technische Hochschule in Munich. The speaker will use Erlenmeyer's early career as a vehicle to explore the relationship between pure and applied chemistry in mid-19th-century Germany.

### **HIST 39 - Identities in the twentieth century**

**Carsten Reinhardt**, [carsten.reinhardt@uni-bielefeld.de](mailto:carsten.reinhardt@uni-bielefeld.de). *President, Chemical Heritage Foundation, Philadelphia, PA 19106, United States*

During the twentieth century, chemistry experienced a series of transformations that arguably greatly affected the collective identity of its practitioners. Among these transformations were the shift of the geographical center from Europe to the United States, and the rise of additional centers such as the Soviet Union, Japan, and China. Next to geographical shifts, transitions in gender roles, and an increased diversity with regards to ethnicity and social background can be observed. In addition, the rise of physical instrumentation expanded the reach of the molecular approach into the life and material sciences, and in doing so changed the outlook of chemists and chemical engineers. In my talk, I will investigate some of the effects of these changes, and discuss the question if we should talk about one professional identity or many.

### **HIST 40 - Chemists in American industry between the world wars**

**John K. Smith**, [jks0@lehigh.edu](mailto:jks0@lehigh.edu). *Department of History, Lehigh University, Bethlehem, PA 18015, United States*

The American chemical industry expanded dramatically between the World Wars creating employment for thousands of chemists. By the late 1930s the American Chemical Society was the country's largest professional

society. My paper examines how the growth of chemistry in industry influenced the discipline as a whole and the status of chemists in and out of academia.

### **HIST 41 - Patents, powders, profits: The significance of the patent infringement trial, Nobel's Explosives Co. v. Anderson (1894)**

**Seymour Mauskopf**, [shmaus@duke.edu](mailto:shmaus@duke.edu). History, Duke University, Durham, North Carolina 27708, United States

This paper is about the competition between ballistite and cordite, particularly turning on the types of nitrocellulose used in each type of explosive, the interaction of Nobel with F. Abel and J. Dewar (and the bad faith of the latter two towards Nobel) and the legal significance of the verdict (which went against Nobel).

### **HIST 42 - Chemists and chemical societies, 1500-1900**

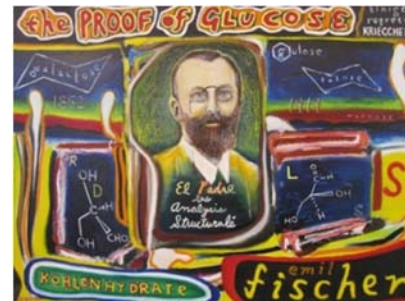
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In the history of chemistry we often write about 'chemists' of the past. But what do we mean when we use that term? Were those 'forerunners' people like ourselves: chemical investigators, in some way educated in chemistry, getting a living out of chemistry, and calling themselves 'chemists'? During most of the period discussed in this lecture this was not the case. The speaker will present a broad 'tour d'horizon' of how within Germany, the Netherlands, Britain, North America the group of those who were called 'chemists' (or similar) gradually changed from alchemists, to medical doctors and preparers of 'chymical' remedies, to teachers of chemistry and, often, other subjects, publishing textbooks and papers on chemistry. Special attention will be paid to when and how chemistry became an 'occupation.' During that process, after about 1750, 'chemical societies' were established as well; sometimes seen as an indicator of 'professionalization.' We will therefore also discuss the nature of those societies and investigate how they changed over time.

### **HIST 43 - New approaches to exploring the history of chemistry through the visual arts**

**David B Cordes**, [cordes@pacificu.edu](mailto:cordes@pacificu.edu). Chemistry, Pacific University, Forest Grove, OR 97116, United States

Richly imaginative, highly symbolic artworks were, at one time, fairly common features of scientific communication. European alchemy of the late medieval and early modern period is particularly well known for its use of cleverly coded, sometimes obscure, engravings and etchings. Today, reliance on text, photos, and standardized graphics in the scientific literature has removed visual art and its required interpretation from the experience of both scientists and students. The fine arts are still employed by outsiders looking to comment on or critique the scientific enterprise, but the arts are rarely used by scientific practitioners themselves to advance concepts, share authentic research results, or to consider the intellectual history and development of their disciplines. This presentation will review some new ways in which chemists and other scientists can engage each other and the public through the fine arts. As the principal example, a series of contemporary oil paintings illustrating some of the history of organic chemistry is considered.



These works can serve as departure points for conversations about the history of chemistry and the cultural context that shapes and influences the development of scientific understanding and practice

### **HIST 44 - Alchemy in India**

**Supriya Saha**<sup>1</sup>, [supriya.saha@pidilite.com](mailto:supriya.saha@pidilite.com), Bipul Behari Saha<sup>2</sup>. (1) Quality Assurance, Pidilite Industries Ltd, Vapi, Gujarat 396195, India (2) Department of R&D, Nagarjuna Agrichem Limited, Hyderabad, Andhra Pradesh 500082, India

Currently India is one of the largest manufacturer and exporter of some group of chemicals like pesticides, active pharmaceutical ingredients, etc. It would be interesting to take a quick look into the history of some chemical processes that were used in ancient India. Alchemy was practised extensively in India with the objectives of: (a) to get rich by converting base metals into gold and (b) to make elixir of life which will enable to live forever.

Mercury occupied a central position in alchemy in India and was considered as divine due to its physical properties such as density, appearance fluidity. However, it was subjected to multi step process, before it was considered ready for converting base metal to gold or preparation of elixir of life. Some examples of these processes are: (a) Svedana (1st step): steaming mercury with vegetables, minerals, alkalis and salts (b) Rodhana (6th step): Mixing the distilled mercury with saline water in a closed pot (c) Sarana (15th step): Digesting mercury with gold or silver in an oil base to enhance further its ability to transformation. After the 17th step, it was ready for transmutation of base metal to gold. It appears that in some cases, the colour of base metal would indeed change to gold. In some ancient texts, it has been written how to distinguish between transmuted gold and natural gold. If both are subjected to heat, the former degrades and the original base metal is seen.

One of the well-known alchemist of India is Nagarjuna. He had written several texts on alchemy. In this presentation, some interesting alchemy practices of India will be discussed.

## **HIST 45 - Near neighbors: Sulfuric acid producers and petroleum refineries in 19th century New York City**

**Peter Spellane**, [pspellane@citytech.cuny.edu](mailto:pspellane@citytech.cuny.edu). Department of Chemistry, New York City College of Technology CUNY, United States

New York City was a center of chemicals production and petroleum refining in the second half of the 19th century. This presentation follows the development of these two industries at Newtown Creek, a narrow waterway located very near the center of modern New York City, during the decades that followed the Civil War. Particular attention is paid to the founding and growth of the Charles Pratt Oil Works and the Nichols Chemical Company, on adjoining properties along the Creek. Beginning in about 1868 the companies grew in technical sophistication, profitability, and interdependence. We use period insurance maps and modern GIS methods to examine Newtown Creek's economic geography and to understand the significance of place in enabling the growth of the area's materials-based economy and of New York City itself. Insurance maps indicate locations and facilities of the then-new companies. We consider the relationships among three chemistry-intensive industries at Newtown Creek: sulfuric acid production, the electrolytic production of high purity copper metal, and the refining of petroleum.

## **HIST 46 - Modern chemical warfare: History, chemistry, morality, a recollection and reflection at the centenary of World War I**

**Joseph Gal**, [joe.gal@ucdenver.edu](mailto:joe.gal@ucdenver.edu). Department of Medicine and Department of Pathology, University of Colorado School of Medicine, Aurora, Colorado 80045, United States

In August 1914, World War I started. Modern chemical warfare began during the war when the German army released 168 tons of chlorine gas on the Belgian front, killing or injuring thousands of Allied (Triple-Entente) soldiers. The Allies responded in kind, and at least 30 substances were used as chemical weapons in the war, including arsenicals, mustard "gas", bromoacetone, chloropicrin, trichloromethyl chloroformate, phosgene, and hydrogen cyanide. Ca. 91,000 were killed by chemical weapons in WWI and ca. 1.2 million injured, often with permanent effects. Mustard agent [bis(2-chloroethyl) sulfide], highly toxic to humans, was particularly devastating and terrorizing. On both sides, many scientists, including eminent chemists, participated in chemical-warfare work, e.g., F. Haber (Nobel laureate, 1918), O. Hahn (Nobel 1944), W. Nernst (Nobel 1920), G. N. Lewis, R. Adams, W. J. Pope, E. Paternò, V. Grignard (Nobel 1912), etc. But some refused to participate, e.g., E. Rutherford (Nobel 1908), H. Staudinger (Nobel 1953), M. Born (Nobel 1954). The Hague treaties (1899, 1907) unequivocally banned poison weapons but were ignored. Since WWI, other treaties have prohibited chemical weapons (e.g., Geneva Protocol, 1925; Chemical Weapons Convention, 1993) but chemical warfare has continued, e.g., by Spain (in Morocco, 1920s), Soviet Union (Tambov rebellion, 1921), Italy (Ethiopia, 1935), Japan (China, 1938-39), US (Vietnam, 1960s-70s); Iraq (1980s). New, even more toxic weapons ("nerve agents", e.g., sarin) have been developed and used, even against civilian populations (e.g., in Syria, 2013). This history raises difficult questions concerning the morality of participation by scientists and industry in weapons-of-mass-destruction development.

## **HIST 47 - ORGN's website: A resource for the study of the history of chemistry and an inspiration to study the history of chemistry**

**Brian J. Myers**<sup>1</sup>, [b-myers@onu.edu](mailto:b-myers@onu.edu), **Edward E. Fenlon**<sup>2</sup>. (1) Department of Chemistry and Biochemistry, Ohio Northern University, Ada, Ohio 45810, United States (2) Department of Chemistry, Franklin & Marshall College, Lancaster, PA 17604, United States

This presentation will delineate the progression of the ACS Organic Division's website ([organicdivision.org](http://organicdivision.org)) from a simply crafted site to one of significant complexity and broad content over the approximately 20 years of its existence. A brief explanation of how certain resources (for laboratory chemists) came to be associated with Organic Division's site will be offered. The bulk of the presentation will focus on how this website initiated, motivated, and enabled a serious investigation into the history of the National Organic Chemistry Symposium (NOS), which was published in the Journal of Organic Chemistry whose readers are primarily experimental chemists, not historians. In addition, this presentation will involve a discussion of the resources on the site that may well serve those interested in the history of the development of modern organic chemistry.

## **HIST 48 - History and development of the reaction mechanisms conference**

**Edward E. Fenlon**<sup>1</sup>, [efenlon@fandm.edu](mailto:efenlon@fandm.edu), **Brian J. Myers**<sup>2</sup>, **Thomas T. Tidwell**<sup>3</sup>. (1) Department of Chemistry, Franklin & Marshall College, Lancaster, PA 17601, United States (2) Department of Chemistry, Ohio Northern University, Ada, OH 45817, United States (3) Department of Chemistry, University of Toronto, Toronto, Ontario M5S 3H6, Canada

The Reaction Mechanisms Conference (RMC) was first held in 1946 and has been held in even numbered years ever since. Charles C. Price and Paul D. Bartlett organized the first RMC and played pivotal roles in establishing the RMC as an ongoing venue that contributed to the growth and maturation of physical organic chemistry. Early RMC were relatively small meetings limited to insiders who were invited. Attendance at the RMC later expanded and became more open. The history and development of the RMC will be presented including an analysis of trends in the prevalence of subdisciplines presented at the 34 conferences.