American Chemical Society
Division of the History of Chemistry

Program and Abstracts

233rd ACS National Meeting
Chicago, IL
March 25-29, 2007

J. S. Jeffers, Program Chair

DIVISION OF THE HISTORY OF CHEMISTRY

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DIVISION OF THE HISTORY OF CHEMISTRY

Final Program, 233rd ACS National Meeting, Chicago, IL, March 25-29, 2007

J. S. Jeffers, *Program Chair*

SOCIAL EVENT:
HIST 85th Birthday Dinner, 7:00, $45 per ticket: Tuesday, March 27th

SUNDAY MORNING

Hyatt Regency McCormick – Room 20C
http://mccormickplace.hyatt.com/hyatt/hotels/index.jsp

General Papers

J. S. Jeffers, *Organizer, Presiding*

8:30 —1. Sweet beginnings of oxyallyl. **D. H. Murray**
8:55 —2. 75 years of chemistry in the mountains: Virginia Blue Ridge's 75th anniversary "Big Bash". **A. K. Addington**
9:20 —3. Chemical education in nineteenth century Germany: Case of the Franckesche Stiftungen in Halle. **P. J. Ramberg**
9:45 —4. Theodor von Grotthuss (1775-1822): Trail Blazer. **B. Jaselskis**, C. E. Moore, A. V. Smolinski
10:10 —5. ACS Petroleum Research Fund with thanks to Dr. Thomas Midgley as ACS President. **H. M. Peters**, D. T. Smorodin

Hyatt Regency McCormick – Room 20C

Landmark Chemistry Books of the Twentieth Century: Authors from the University of Illinois

Cosponsored with Bolton Society, ACS East Central Illinois Section, CHED, and CINF
V. V. Mainz, *Organizer, Presiding*

10:50 —6. Books by R. C. Fuson. **P. R. Jones**
11:20 —7. *Organic Syntheses*: Past and present. **J. P. Freeman**
11:40 —8. *Inorganic Syntheses*: Classic series of chemistry books with strong connections to the University of Illinois. **J. P. Fackler Jr.**

Claude S. Hudson Award in Carbohydrate Chemistry: Symposium in Honor of Pierre Sinaÿ

Sponsored by CARB, Cosponsored with HIST, MEDI, and ORGN

SUNDAY AFTERNOON

Hyatt Regency McCormick – Room 20C

Landmark Chemistry Books of the Twentieth Century: Authors from the University of Illinois

Cosponsored with Bolton Society, ACS East Central Illinois Section, CHED, and CINF
V. V. Mainz, *Organizer, Presiding*

1:30 —9. *Chemistry of the Coordination Compounds*: J. C. Bailar, Jr. monograph. **R. D. Archer**
1:50 —10. Continuing the Renaissance in Inorganic Chemistry: Drago's *Physical Methods in Inorganic Chemistry*. **C. E. Webster**
2:10 —11. Forging the "key to the world's chemical literature": Origins of CA. **J. E. Mears**
2:30 —12. Impacts of Bard and Faulkner's *Electrochemical Methods*. **J. Leddy**
2:50 — Intermission.
3:05 —13. Malmstadt, Enke, and Crouch texts in electronics for scientists. **C. G. Enke**
3:25 —14. Marion Sparks' *Chemical Literature and Its Use*: First chemical information text. **T. E. Chrzastowski**, **F. B. Culp**
3:45 —15. *Molecular Structure and Dynamics*: Legacy of Willis H. Flygare. **J. M. Lisy**
4:05 —16. Therald Moeller's *Inorganic Chemistry, an Advanced Text Book*. **D. H. Busch**
4:25 —17. *Organic Reactions*: Enduring classic. **S. E. Denmark**

Claude S. Hudson Award in Carbohydrate Chemistry: Symposium in Honor of Pierre Sinaÿ

Sponsored by CARB, Cosponsored with HIST, MEDI, and ORGN

MONDAY MORNING

Hyatt Regency McCormick – Room 20C

Landmark Stable Free Radicals of the 20th Century

Cosponsored with ORGN
E. T. Strom, *Organizer, Presiding*

8:30 — Introductory Remarks
8:35 — HIST Citation for Chemical Breakthroughs. **R.A. Egolf, J.I. Seeman**
8:40 —18. Gomberg's free radical: Triphenylmethyl. **P. R. Jones**
9:10 —19. Nitroxides: Wieland, Lebedev, Rozantsev, Hoffman, and Rassat. **S. C. Rasmussen**, G. R. A. Wyllie
9:50 —20. Stefan Goldschmidt and DPPH. **G. D. Mendenhall**
10:20 — Intermission.
10:35 —21. C. Frederick Koelsch and his radical: A case of premature discovery? **E. T. Strom**
11:05 —22. Glen A. Russell and semidiones. **K. M. Trahanovsky**
11:35 —23. First organic ferromagnet: Minoru Takahashi and the *p*-nitrophenyl nitronyl nitroxide radical. **J. K. Borchardt**

MONDAY AFTERNOON

Hyatt Regency McCormick – Room 20C

ACS Chemical Landmarks Program: Celebrating the History of Chemistry

J. B. Ginsberg, *Organizer, Presiding*

1:30 —24. Overview of the National Historic Chemical Landmarks Program. **J. B. Ginsberg**
2:00 —25. From Belmont to Bakelite: Recollections of the (pre)history of the National Historic Chemical Landmarks Program. **J. L. Sturchio**
2:30 —26. Landmark designation: Recipient's view. **V. V. Mainz**
3:00 —27. International Landmarks. **E. Wasserman**
3:30 —28. IEEE's history programs. **M. N. Geselowitz**
4:00 —29. Do historians or chemists write better history of chemistry? **S. Mauskopf**

MONDAY EVENING

Hyatt Regency Chicago
http://chicagoregency.hyatt.com/hyatt/hotels/index.jsp

Sci-Mix

J. S. Jeffers, *Organizer*

8:00 - 10:00

2, 44, 52, 58. See symposium listings.

TUESDAY MORNING

Hyatt Regency McCormick – Room 20C

Going with the Flow: Water Sustainability Past, Present, Future

Cosponsored with PRES, SUST, and ENVR
M. V. Orna, *Organizer, Presiding*

8:30 — Introductory remarks: M. V. Orna.
8:35 —30. Water, water, everywhere. Will there be a drop to drink? **C. P. Casey**
8:50 —31. Waters at the intersection of chemistry and culture. **C. Hamlin**
9:15 —32. Water, water everywhere: Role of the water analyst in 19th. century England. **H. Goldwhite**
9:40 —33. Clean water for all: Progress of water treatment technology in the 20th Century. **D. A. Dzombak**, J. M. VanBriesen, J. A. Tarr
10:05 — Intermission.
10:20 —34. Porous polymers via macroreticular synthesis: Nature and applications. **R. Albright**
10:45 —35. Historical perspective on ion exchange resin technology for water purification. **R. Banavali**, S. Boyce
11:10 —36. Arsenic, nitrate, and perchlorate in water: Dangers, distribution, and removal. **D. F. Martin**, B. B. Martin, R. Alldredge

11:35 —37. Arsenic crisis on the Indian subcontinent: A sustainable solution and the role of chemistry. **A. K. SenGupta**
12:00 — Closing remarks: C. T. Hunt.

TUESDAY AFTERNOON

Hyatt Regency McCormick – Room 20C

HIST at 85: Looking Back and Looking Ahead

J. J. Bohning, *Organizer*
J. I. Seeman, *Organizer, Presiding*

1:30 — Introductory Remarks: Roger Egolf, Chair, HIST.
1:35 —38. Looking back: Eighty-five years of chemists and their history. **J. J. Bohning**
2:00 —39. Communicating the history of chemistry. **P. R. Jones**
2:30 —40. What's history got to do with a newsmagazine? **R. M. Baum**
3:00 —41. Role of HIST in the history of chemistry. **J. I. Seeman**
3:25 — Intermission.
3:40 —42. Role of history and the Division of the History of Chemistry in the American Chemical Society. **D. Creech**
4:10 —43. Future of the past: Intellectual and structural issues. **A. W. Thackray**
4:40 —44. Looking ahead: Keeping history of chemistry relevant to the future of chemistry. **C. J. Giunta**
5:10 — Concluding Remarks: Roger Egolf.

TUESDAY EVENING

Szechwan Restaurant, 625 N. Michigan Avenue, http://szechwanchicago.com/.

HIST at 85: Celebration Dinner

R. A. Egolf, *Organizer*

6:00 — Cash Bar
7:00 — Dinner, tickets $45.00, available in advance

WEDNESDAY MORNING

Hyatt Regency McCormick – Room 20C

General Papers

J. S. Jeffers, *Organizer, Presiding*

8:30 —45. New developments in the history and philosophy of the periodic system. **E. Scerri**
8:55 —46. Joint papers of Alfred Werner and Paul Karrer. **D. F. Martin**, B. B. Martin
9:20 —47. Xenon: Strange one. **K. Kostecka**

Hyatt Regency McCormick – Room 20C

Hog Butchers, Tool Makers, and Stackers of Wheat: Chicago-area Chemical Industry and Government-Sponsored Laboratories

Cosponsored with ACS Chicago Section, IEC, PROF, and SCHB
K. P. Fivizzani, *Organizer*
Anthony Tortorello, *Presiding*

10:00 —48. Obiter Research LLC: Six years down the road. **W. A. Boulanger**
10:20 —49. Carbohydrate research at the USDA Laboratory in Peoria, Illinois. **G. L. Côté**, V. L. Finkenstadt
10:40 —50. USDA, Agricultural Research Service: Research for the growing world. **R. M. Wagner**, K. M. O'Hara
11:00 —51. DSM Desotech: Pioneer in radiation curing technology. **A. J. Tortorello**, T. E. Bishop
11:20 —52. Rise and fall of the Chicago white lead industry. **A. Fitch**
11:40 —53. Still Nalco after all these years. **K. P. Fivizzani**

WEDNESDAY AFTERNOON

Hyatt Regency McCormick – Room 20C

Educating the Laughing, Stormy, Husky Youth of the Midwest: Chicago-Area Colleges and Universities

Cosponsored with ACS Chicago Section, PROF, and CHED
K. P. Fivizzani, *Organizer, Presiding*

1:30 —54. College of DuPage: Chemistry at a premier community college. **S. Shih**
1:55 —55. Founding of the Loyola University Chicago Chemistry Department. **C. E. Moore**
2:20 —56. Chemistry in an arts, media and communications environment. **C. E. Cannon**
2:45 — Intermission.
3:00 —57. IMSA - A unique experience for Illinois high school students. **C. E. Cannon**
3:25 —58. Learning and lecturing preferences: Description of an incoming PharmD class. **R. M. Zavod**, D. P. Zgarrick, C. Duong
3:50 —59. Martin Kilpatrick's chemistry legacy at IIT. **P. Lykos**

Abstracts

HIST 1 Sweet beginnings of oxyallyl
Desmond H. Murray, Department of Chemistry and Biochemistry, Andrews University, Berrien Springs, MI 49104-0430, murrayd@andrews.edu

Oxyallyl cations are synthetically useful and mechanistically important transient intermediates for synthesis of a wide variety of biologically active substances. In seminal work reported in 1990 involving the use of alpha-ketoacetals as precursors to oxocarbenium oxyallyl cations, we also uncovered a different historical narrative regarding literature reports of these reactive intermediates. Conventional accounts of oxyallyl chemistry generally begin with Aston and Newkirk's 1951 proposal that oxyallyls are formed as transient intermediates in the Favorskii rearrangement. Later on in 1962, Fort provided kinetic data in support of these intermediates and went on to design an experiment to trap them with furan as [4 + 3] cycloadducts. This paper will provide evidence from the chemical literature of earlier observations of oxyallyl intermediates in carbohydrate transformations. This observation does not only correct the historical record but is anticipated to provide impetus for a systematic development of carbohydrate oxyallyl chemistry.

HIST 2 75 years of chemistry in the mountains: Virginia Blue Ridge's 75th anniversary "Big Bash"
Adele K. Addington, Department of Chemistry, Roanoke College, 221 College Ave., Salem, VA 24153, Fax: 540-375-2055, addington@roanoke.edu

On October 23, 2006, (Mole Day, of course!) the Virginia Blue Ridge section celebrated its 75th anniversary with a "Big Bash" gala. Held at the historic Hotel Roanoke, a site of significance to the sections' founding, over 60 members and student affiliates gathered for a fun evening. In the words of founding member Harry I. Johnson, our section grew from "a group of chemical friends" who formed the Southwest Virginia Chemists' Club; this group first officially met on October 17, 1927, at the Hotel Roanoke. The group soon decided to petition the ACS for a new local section charter, which was issued on May 18, 1931. This talk will feature the history of the founding of the Virginia Blue Ridge section, its 75 year history, and a discussion of our celebratory "Big Bash."

HIST 3 Chemical education in nineteenth century Germany: Case of the Franckesche Stiftungen in Halle
Peter J. Ramberg, Science Division, Truman State University, 100. E. Normal, Kirksville, MO 63501, ramberg@truman.edu

In 1695, the pietist August Francke (1663-1727) founded an educational institution for orphans in the city of Halle. In the next 150 years, different schools and institutions were added to the original orphanage by Francke's successors to create the Frankesche Stiftungen, one of the largest educational complexes in Germany. Among these institutions was the Realschule, created in the 1830s. The annual reports of the Realschule contain details about the subjects and assignments required by students, including topics in mathematics and science, and each annual report contains a scholarly paper by one of the faculty, often on pedagogical issues. The annual report for 1853 discusses the year long course of chemistry instruction for the students and offers a small window into nineteenth century chemical education in Germany. This paper will contain a brief description of the Franckesche Stiftungen and its Realschule, its science curriculum, and the course in chemistry as described in the 1853 annual report.

HIST 4 Theodor von Grotthuss (1775-1822): Trail Blazer
Bruno Jaselskis, Carl E. Moore, and Alfred Von Smolinski, Department of Chemistry, Flanner Hall 201A, Loyola University Chicago, 6525 N Sheridan Road, Chicago, IL 60626, Fax: 773-508-3086, bjasels@luc.edu

Two hundred years ago Theodor von Grotthuss published a major Memoire (1805) which in a short time was reprinted in other journals and was translated into English. In this paper Grotthuss presented an electrolysis interpretation of the galvanic process. He perceived the battery not only as a galvanic generator but also as a polarized system composed of particles (molecules) of opposing electrical nature. This was contrary to the prevailing electrostatic interpretation. This landmark document laid out new directions for the interpretation of galvanic phenomena. It influenced future investigations carried out by Sir Humphry Davy, John J. Berzelius, and Michael Faraday. Grotthuss in his short lifetime contributed in many areas of chemistry. However, his contributions in the area of electrolysis of water and photochemistry were the corner stone for years to come. Krikštopaitis in his interesting book "Pralenkês Laika" (Ahead of the Times) states " If Alfred Nobel would have instructed to award a prize for works done a century earlier, T. Grotthuss would have been awarded twice- once for his electrolysis theory and the second for his photochemistry postulates" Indeed, Grotthuss was a trail blazer.

HIST 5 ACS Petroleum Research Fund with thanks to Dr. Thomas Midgley as ACS President
Howard M. Peters, Peters, Verny, Jones & Schmitt, LLP, 425 Sherman Avenue, Suite 230, Palo Alto, CA 94306, Fax: 650-324-1678, peters4pa@sbcglobal.net, and David T. Smorodin, American Chemical Society

The ACS Petroleum Research Fund is one of the top 125 foundations in the US with assets of over $530 million and one of the few focused on chemistry research and education. PRF came into existence in 1944 as the result of an anti-trust legal settlement during the wartime ACS Presidency of Dr. Thomas Midgley. This paper will explore some early events to modern times of PRF and the critical involvement of Dr. Midgley, a vice-president of General Motors Research. Some information about Midgley's life and commercial contributions (www.invent.org) will also be provided, including his invention of tetraethyl lead to improve anti-knocking properties of gasoline (US1,573,846 in 1925) and the invention of the chlorofluorocarbons (CFC, the FREONS) for refrigeration purposes (US1,833,847 in 1930). (US Patents are available free with figures by number at www.pat2pdf.org)

HIST 6 Books by R. C. Fuson
Paul R. Jones, Department of Chemistry, University of Michigan, 930 N. University, Ann Arbor, MI 48109-1055, Fax: 734-647-4865, prjones@umich.edu

During his multi-decade career at the University of Illinois, R. C. Fuson authored or coauthored an array of books, varying from elementary coverage of organic chemistry to advanced treatises for graduate students and professionals. His first publication in 1939, a set of lectures for the advanced student, ushered in a career of book writing, which has persisted long after his death, in the form of the remarkably enduring editions of “Systematic Identification of Organic Compounds.”

HIST 7 *Organic Syntheses*: Past and present
Jeremiah P. Freeman, Department of Chemistry and Biochemistry, University of Notre Dame, Notre Dame, IN 46556, jfreeman@nd.edu

Organic Syntheses serves as a "recipe book" for the preparation of organic compounds whose "recipes" have been tested in an independent "kitchen". Beginning from four pamphlets on Organic Chemical Reagents published by Roger Adams between 1919-1922, *Organic Syntheses* was begun in 1921 by Adams and Carl Marvel at Illinois together with J. B. Conant at Harvard, H. T. Clarke at Eastman Kodak, and O. Kamm at Parke Davis. At a time when there were few sources of organic research chemicals available commercially, it consisted of an annual volume of sets of directions for the preparation of organic compounds that had been tested and refined by members of the editorial board in their labs with their coworkers. The venture has continued to this day with more emphasis on the description of new methods as the commercial availability of chemicals expanded greatly. Most recently web publication has been made available without cost.

HIST 8 *Inorganic Syntheses*: Classic series of chemistry books with strong connections to the University of Illinois
John P. Fackler Jr., Department of Chemistry, Texas A&M University, University Drive, College Station, TX 77843-3255, Fax: 979-845-2373, Fackler@mail.chem.tamu.edu

Although there were few inorganic chemists in the US in the 1930's, Harold S. Booth (Western Reserve) managed to convince L. F. Audrieth (Illinois), W. C, Fernelius (Ohio State), Warren. C. Johnson (Chicago) and Raymond E. Kirk (Brooklyn Poly) to support the creation of a corporation to publish a series of books detailing inorganic syntheses. The first volume appeared in 1939. Volumes 3, 4, and 5 were edited by the Illinois faculty, Audrieth, John C. Bailar and Therald Moeller. John R. Shapley (Illinois) recently edited the 34th volume. While there are other excellent books on inorganic syntheses, *Inorganic Syntheses* is currently producing its 36th volume. Each synthesis is checked for reproducibility by a person or team of chemists elsewhere. As a result, these syntheses have found their way into undergraduate and research chemistry laboratories worldwide.

HIST 9 *Chemistry of the Coordination Compounds*: J. C. Bailar, Jr. monograph
Ronald D. Archer, Department of Chemistry, University of Massachusetts, Lederle Graduate Research Towers, Amherst, MA 01003-9336, Fax: 413-545-4490, archer@chem.umass.edu

The monograph *Chemistry of the Coordination Compounds* in 1956 by the late Prof. John C. Bailar, Jr., with chapters by a sizeable number of his former research students, was a significant book in a rapidly growing segment of chemical research. Conrad Fernelius noted, “Bailar's book is the most complete book on coordination compounds available in the English language and possesses distinct advantages over the German compilations. It is a very valuable contribution and will greatly facilitate further research in an important field of chemistry which cuts across the conventional areas of inorganic, organic, physical, analytical and biological chemistry.” The first chapter by Bailar and Daryle Busch elegantly surveys the comprehensive nature of coordination chemistry. This chapter is followed by a wide variety of topics for a total of 23

chapters with almost 800 pages of text. Even so, Bailar acknowledged in the preface that several important topics were not included!

HIST 10 Continuing the Renaissance in Inorganic Chemistry: Drago's *Physical Methods in Inorganic Chemistry*
Charles Edwin Webster, Department of Chemistry, The University of Memphis, Memphis, TN 38152-3550, cewebstr@memphis.edu

In the 1950's and 1960's Russell S. Drago and his colleagues at the University of Illinois were among the top in the world in chemistry, and they created a powerhouse in Inorganic chemistry. In 1965, Drago authored a classic text, *Physical Methods in Inorganic Chemistry*. He made use of numerous examples in the early days of the application of physical methods to inorganic chemistry. His own research inspired many of the lucid explanations, and his passion for knowledge in chemistry is demonstrated in every topic. His text was the first of its kind in this expanding area; future texts on the subject imitated his approach to learning using application of the methods to specific examples. The first edition was written at a time when no other text offered in one bound volume so much. Drago's text sets a high standard of excellence with historical importance, which this presentation will highlight.

HIST 11 Forging the "key to the world's chemical literature": Origins of CA
Janice E. Mears, Marketing Communications, CAS, 2540 Olentangy River Rd., Columbus, OH 43202, Fax: 614-447-3837, jmears@cas.org

Although Chemical Abstracts was not the first secondary information resource for chemistry-related information, its impact during a hundred years of publication has been profound. It has been said that a good idea has many fathers, and similarly, it can be said that CA has had a number of homes over the years. First published in 1907 at the Bureau of Standards in Washington, D. C., where the CA Editor William Noyes was chief chemist, CA offices moved to the University of Illinois in September of that year, when Noyes became chairman of the chemistry department. Noyes was succeeded as Editor in 1909 by Austin Patterson, who moved CA to the Ohio State University in Columbus, Ohio, where he had been invited to join the chemistry faculty. CA and CAS, a division of the American Chemical Society, have remained in Columbus ever since. But the information resource, the dedicated staff who produce it, and CAS facilities have evolved greatly. These beginnings and salient developments will be explored, and it will be demonstrated that CAS has remained focused on its original mission to keep chemists and other scientists in touch with the published work of their colleagues worldwide.

HIST 12 Impacts of Bard and Faulkner's *Electrochemical Methods*
Johna Leddy, Department of Chemistry, University of Iowa, Iowa City, IA 52242, Fax: 319-335-1270, johna-leddy@uiowa.edu

When the first edition of *Electrochemical Methods* (ISBN 0-471-05542-5) by A. J. Bard and L. R. Faulkner was published in 1980, the book created a new perspective and organization of the collective knowledge that was electrochemistry and electroanalysis. It bridged the gap of electrochemistry as analytical and physical chemistry. Most electrochemists have substantial familiarity with the book as both text and reference, and much of contemporary electroanalysis is appreciated within the context of the perspective provided in *Electrochemical Methods*. The impact of the book on electrochemical education and the development of electroanalysis will be discussed. Examples will be drawn from experiences of various electrochemists over the 26 years since the publication of the book.

HIST 13 Malmstadt, Enke, and Crouch texts in electronics for scientists
Christie G. Enke, Chemistry, University of New Mexico, Clark Hall, Albuquerque, NM 87131, enke@unm.edu

When I came to UIUC in 1955 as a graduate student, Howard Malmstadt was an Assistant Professor. Howard asked me to help him create a graduate lecture/laboratory course in electronics and measurements. This evolved into a summer course for practicing scientists and the first text, *Electronics for Scientists* (1962). The experiments were included and Heath Company sold the equipment. This course was taken up by chemistry and physics departments all over the country. The rapid evolution of solid-state electronics led to *Digital Electronics for Scientists* (1969), with experiments incorporating the first integrated circuits. Stan Crouch joined the team for further iterations of the text *Electronic Measurements for Scientists* (1974), *Electronics and Instrumentation for Scientists* (1981), and *Making the Right Connections* (1994), and for development and presentation of the ACS Short course. In their time, these texts played a significant role in the early development of modern chemical instrumentation.

HIST 14 Marion Sparks' *Chemical Literature and Its Use*: First chemical information text
Tina E. Chrzastowski, Chemistry Library, University of Illinois at Urbana Champaign, 170 Noyes Laboratory, 505 S.

Mathews, Urbana, IL 61801, Fax: NA, chrz@uiuc.edu, and **F. Bartow Culp**, Mellon Library of Chemistry, Purdue University, 504 West State Street, West Lafayette, IN 47907-2058, bculp@purdue.edu

Marion Sparks' lifelong interest was teaching chemical literature. In 1912, she began by giving three lectures to the University of Illinois' Chemistry Club on library research; she presented six lectures in 1913. During the 1914-1915 school-year, Sparks began teaching "Chemistry 19", a required course for junior chemistry majors. In 1919, using class notes compiled from her previous five years of teaching, Sparks self-published her textbook for the course. With *Chemical Literature and Its Use*, she arguably authored and published the first book to address chemical literature and library instruction, and formalized the field of chemical information. A second edition, also self-published and self-distributed, was produced in 1921.

HIST 15 *Molecular Structure and Dynamics*: Legacy of Willis H. Flygare
James M. Lisy, Department of Chemistry - Box 7-6, University of Illinois at Urbana-Champaign, 600 S. Mathews Ave., Urbana, IL 61801, Fax: 217-244-3186, j-lisy@uiuc.edu

This classic book by Bill Flygare combined, for the first time, all of the elements of modern physical chemistry. Created from his unique two semester course at the University of Illinois for advanced undergraduate and graduate students, Flygare introduced the important topics of time- and frequency-resolved spectroscopy, coherent excitation processes, scattering, and electronic structure calculations, from the perspective of an experimentalist. The synergy between experiment and theory, required for definitive analysis of the most challenging investigations in physical chemistry, is presented in examples from both spectroscopy and dynamics.

HIST 16 Therald Moeller's *Inorganic Chemistry, an Advanced Text Book*
Daryle H Busch, Department of Chemistry, University of Kansas, 1501 Wakarusa Drive, Bldg A, Lawrence, KS 66047, Fax: 785-864-6051, busch@ku.edu

Fascinating that a text beginning (Page 3, Chapter I, Introduction) with the statement “Inorganic chemistry is not General Chemistry” should have anticipated the future and established the format, for decades to come, of a blossoming realm of scientific understanding, but such is the history of chemistry. Early inorganic chemistry was simply descriptive whereas Moeller's emerging new inorganic chemistry sought the orderly understanding of the non-organic matter of the universe as it exists at sub-plasmic temperatures. In a two part format his book presented the principles of the field in a rational and foundational form and then proceeded to examine the known inorganic chemical substances, largely in terms of the principles. At a time when even the generalities, never mind the principles, were limited in number and scope, Dr. Moeller presented an understandable description of much of known matter in a rational and orderly manner. The textbooks of Advanced Inorganic Chemistry that followed built on his format, adding topic after topic, always beginning with ever expanding principles and then switching focus to the exciting molecules of modern inorganic chemistry. Remarkably, Professor Moeller anticipated the encyclopedic expansion of both structure/dynamic principles and knowable substances and provided the matrix for their understanding

HIST 17 *Organic Reactions*: Enduring classic
Scott E. Denmark, Department of Chemistry, University of Illinois at Urbana-Champaign, 245 Roger Adams Laboratory Box 18-5, 600 S. Mathews Avenue, Urbana, IL 61801, Fax: 217-333-3984, denmark@scs.uiuc.edu

Organic Reactions, the second brainchild of Roger Adams, was originally formulated in 1939 and the first of now 67 volumes (containing a record 12 chapters) appeared in 1942. The aim of *Organic Reactions* has been to assist organic chemists by providing "critical discussions of the more important (synthetic) reactions". *Organic Reactions* is unique in the chemical literature in the way it presents an authoritative analysis of the topic reaction accompanied by comprehensive tables that organize all published examples of the reaction being reviewed. This combination of critical discussion and thorough coverage is responsible for the leading position this series occupies for scientists interested in the reactions of organic chemistry. It is a remarkable testimony to the dedicated efforts of its authors, editors and editorial assistants that *Organic Reactions* has lasted for 65 years on the basis of almost entirely voluntary service.

HIST 18 Gomberg's free radical: Triphenylmethyl
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Although the account of Moses Gomberg's work in 1900 on the synthesis of hexaphenylethane and his hypothesis of its dissociation into the free radical, triphenylmethyl, has been described many times, it is fitting to begin a symposium on free radicals with this pioneering research. Born in Russia and educated at the University of Michigan, Gomberg spent his entire

career in Ann Arbor, except for a stint in Germany, divided between the laboratories of Adolf von Baeyer and Victor Meyer. This turned out to be a crucial year, in which he synthesized tetraphenylmethane, was inspired to prepare more highly arylated alkanes, and thus was led into observing experimentally the first free radical.

HIST 19 Nitroxides: Wieland, Lebedev, Rozantsev, Hoffman, and Rassat
Seth C. Rasmussen, Department of Chemistry and Molecular Biology, North Dakota State University, Fargo, ND 58105, Fax: 701-231-8831, seth.rasmussen@ndsu.edu, and Graeme R. A. Wyllie, Department of Chemistry, Concordia College

Organoaminoxyl radicals, commonly referred to as nitroxyls or nitroxides, have found widespread use as radical traps and spin labels. The first stable example, diphenylnitroxide, was reported in 1914 by H. Wieland. While aromatic analogues followed, it was not until 1959 that O. L. Lebedev reported the preparation of the cycloaliphatic 2,2,6,6-tetramethylpiperidine-N-oxide (TEMPO). Work on cycloaliphatic systems was then continued by E. G. Rozantsev. As the original TEMPO work was published in provincial Russian sources, it was not until Rozantsev started publishing in international journals that this work became of notice. Between the original TEMPO preparation and its discovery by the scientific community, A. K. Hoffmann reported the preparation of di-t-butylnitroxide in 1961. Finally, A. Rassat explained the instability of most nitroxides in the mid 1960s, laying out the requirements for future stable systems. The work of these groups in the development of this class of organic radicals will be presented.

HIST 20 Stefan Goldschmidt and DPPH
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A biographical sketch of Stefan Goldschmidt, the discoverer of the persistent radical DPPH, will be presented. The chemistry of 2,2-diphenyl-1-picrylhydrazyl, its derivatives, crystal structure, solvent complexes, and practical applications will be reviewed. A possible mode of thermal decomposition of DPPH will be suggested.

HIST 21 C. Frederick Koelsch and his radical: A case of premature discovery?
E. Thomas Strom, Department of Chemistry and Biochemistry, University of Texas at Arlington, 700 Planetarium Place, Arlington, TX 76019-0065, Fax: 817-272-3808, tomstrom@juno.com

In the Aug. 20, 1957 issue of The Journal of the American Chemical Society, an article appeared by C. Frederick Koelsch on a new stable radical, alpha, gamma-bisdiphenylene-beta-phenyl allyl. However, the first footnote of the article revealed that this paper, essentially unchanged, had been submitted to the journal on June 9, 1932. A referee held that the properties of the compound could not be those of a free radical. This paper will describe the career of Koelsch, an early winner of the ACS award in pure chemistry, present the background of the original discovery, and explore the reasons for the 25 year hiatus in publication.

HIST 22 Glen A. Russell and semidiones
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Glen A Russell earned a Ph D with Herbert C Brown at Purdue, worked at the General Electric Research laboratory, and then spent forty years (1958-1998) in the Chemistry Department at Iowa State University. During his career he made significant contributions to the understanding of several classical free radical reactions such as halogenation and autoxidation. He was a pioneer in the use of electron spin resonance to study organic radicals. Early in that work he and graduate student Tom Strom discovered that oxidation of alpha hydroxyketones or reduction of alpha diketones in dimethylsulfoxide with base generated an alicyclic semiquinone type radical anion for which Russell coined the name semidione. Over several years Russell and coworkers used the semidione functionality as a spin center to study electron delocalization and conformations of a large number of aliphatic and alicyclic systems.

HIST 23 First organic ferromagnet: Minoru Takahashi and the *p*-nitrophenyl nitronyl nitroxide radical
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In 1991, Dr. Minoru Takahashi and coworkers at the Institute of Solid State Physics at the University of Tokyo reported that an organic radical crystal, *p*-nitrophenyl nitronyl nitroxide (*p*-NPNN), is a quasi-1D ferromagnet induced by unpaired electrons of radicals. This is the first example of a ferromagnet that doesn't contain metal elements. *p*-NPPN exhibits long-range ferromagnetic order below a transition temperature of 0.65 K. Polarized neutron diffraction was used to determine the distribution of unpaired electrons in the solid phase, and X-ray diffraction was used to determine total electron distribution in

the system. This discovery is significant because, like lightweight batteries, lightweight magnets would have numerous technological applications. Since the discovery of *p*-NPNN, oriented films of the NPNN radical have been extensively studied. Like the search for high- temperature superconductors, the search for high-temperature organic ferromagnets continues apace.

HIST 24 Overview of the National Historic Chemical Landmarks Program
Judah B. Ginsberg, Office of Communications, American Chemical Society, 1155 16th Street, Washington, DC 20036, Fax: 202-872-4370, j_ginsberg@acs.org

The mission and goals of the National Historic Chemical Landmarks Program and the tools used to implement those goals. This paper will look at methods of publicizing the program and tools used to reach the public. The value of the program will be discussed as well as an analysis of the data gathered on the program's impact. The paper will also explore related programs.

HIST 25 From Belmont to Bakelite: Recollections of the (pre)history of the National Historic Chemical Landmarks Program
Jeffrey L. Sturchio, External Affairs, Europe, Middle East, Africa, Canada, Merck & Co., Inc, One Merck Drive/WS2A-55, Whitehouse Station, NJ 08889-0100, Fax: 908-735-1839, jeffrey_sturchio@merck.com

The National Historic Chemical Landmarks Program (NHCLP) arose from the convictions of a small, but dedicated and enthusiastic, group of ACS members in the early 1990s who wanted to improve public understanding and appreciation of the many ways in which chemistry, chemical engineering and chemical enterprise have shaped the modern world. Drawing on earlier models in national historic preservation and engineering, the NHCLP was established under the auspices of the Division of History of Chemistry, with support from ACS in Washington. The first landmark to be designated was Leo Baekeland's Bakelizer, the first production vessel for the new plastic, Bakelite, introduced nearly a century ago. This talk, by an early chairman of the NHCLP, will review the thinking and context from which this successful public outreach program emerged.

HIST 26 Landmark designation: Recipient's view
Vera V. Mainz, VOICE NMR Laboratory, University of Illinois at Urbana-Champaign, 142B RAL, Urbana, IL 61801

On September 13 and 14, 2002, a celebration was held in commemoration of the 100th anniversary of the opening of Noyes Laboratory. Over 200 alumni and friends of the Departments of Chemistry, Biochemistry, and Chemical Engineering participated in the weekend's events. The primary event for the weekend was the ceremony designating Noyes Lab as a National Chemical Landmark by the American Chemical Society. Around this event were planned other activities which included the unveiling of a “Roster of Noyes Lab," recognizing all students who have received UIUC degrees in the three departments since the founding of the University in 1867, and talks about the history of chemical sciences at Illinois, given by Nelson Leonard, Rudy Marcus, former Shell CEO Steve Miller, and the historian Sharon McGrayne. Our experience with this landmark designation was uniformly positive.

HIST 27 International Landmarks
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International Landmarks recognize global developments in the worlds of science and the interdependence of research involving contributions from many countries. During its first five years Landmarks focused on advances within the United States but also included the first International designation. In 1997-8 the discovery of Tagamet in Great Britain and the subsequent process research and development in Pennsylvania were celebrated. These paired ceremonies were jointly sponsored by the Royal Society of Chemistry and the ACS. 1999 was designated the International Year of Chemistry by the ACS and many other chemistry societies. Web-based projects were created in order to involve students from a number of countries. Several International Landmarks complemented these activities by recognizing major research accomplishments in different nations. In mid-December, 1998 a Landmark was dedicated in Calcutta, India for the Raman Effect. The event was co-hosted by the ACS and the Indian Association for the Cultivation of Science. The participation of our Chemical Society demonstrated the movement of intellectual boundaries. Raman was a physicist and received the Nobel Prize in Physics but most Raman spectroscopy is now pursued in chemistry departments. Other international designations took place in the United Kingdom, Germany and France. Our partnering with their chemical societies has also contributed to the establishment of Landmark programs by the Royal Society of Chemistry and the Gesellschaft Deutscher Chemiker.

HIST 28 IEEE's history programs
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This paper describes the active program to preserve, research, and promote the legacy of electrical, electronic, information, and computer fields and professions carried out by IEEE, the world's largest professional technical society. The activities are overseen by the History Committee, a standing committee of the Board of Directors, and carried out largely by the professional staff of the IEEE History Center. The Center is located at Rutgers, the State University of New Jersey, which is also a cosponsor. In addition to participating in the history of technology programs at Rutgers, the Center's activities include: Coordinating the IEEE Milestones Program (similar to the ASME and ASCE Landmarks programs); collecting and maintaining oral histories of prominent engineers; curating the IEEE Archives; publishing a newsletter; and providing resources over the Web for professionals interested in the history of technology and the general public. A major thrust of the Center's mission is increase public understanding of the role of engineers and engineering in the formation of modern society.

HIST 29 Do historians or chemists write better history of chemistry?
Seymour Mauskopf, Professor of History, Duke University, 325 Carr Building, Durham, NC 27708, shamus@duke.edu

As was the case throughout the archaic period in the history of science (say, pre-1950), the writing of the history of chemistry was largely the province of chemists. Hermann Kopp's "Geschichte der Chemie" (1843-1847) and subsequent historical writings are still used and cited. Marcellin Berthelot's Les Origines de l"Alchimie (1885) was a pioneering historical study. Even the very philosophical Helene Metzger was trained in crystallography. J.R. Partington's historical studies should be counted as belonging to this earlier tradition, even though they were published after its end. But with the professional development of the history of science, the history of chemistry has been taken up by a number of scholars with training primarily in history rather than chemistry or related sciences. What differences do the change in training make? I shall select a few modern representatives of historians of chemistry trained initially as chemists and as historians of science to explore this question.

HIST 30 Water, water, everywhere. Will there be a drop to drink?
Charles P. Casey, Department of Chemistry, University of Wisconsin-Madison, 1101 University Avenue, Madison, WI 53706, Fax: 608-262-7144, casey@chem.wisc.edu

The symposium on "Going with the Flow: Water Sustainability: Past, Present, Future" will be introduced. Results from the National Research Council Report on the workshop on "Water and Sustainable Development" will be discussed.

HIST 31 Waters at the intersection of chemistry and culture
Christopher Hamlin, Department of History/Program in History and Philosophy of Science, University of Notre Dame, 219 O'Shaughnessy, Notre Dame, IN 46556, hamlin.1@nd.edu

In the past two centuries, analytical chemistry has been one of the principal guarantors of safe water in the industrialized world. Outside wealthy and well-watered regions, however, establishment of safe and sustainable water supplies often requires significant tradeoffs or negotiation of priorities in such areas as water re-use, drinking water standards, and use-specific purification. The meeting of both consumer expectations and health and environmental goals in multiple cultural settings may involve recognition of analytical variables or composite proxies that are currently unappreciated. Not only will such contexts call upon chemists to be technically imaginative in analysis, remediation, and monitoring, they will require them to be culturally sensitive and linguistically sophisticated as well. Following the “waters” vs. “water” approach, I shall argue that chemists can prepare for such domains of application by exploring the pre-Lavoisierian conception of “waters” within their own discipline.

HIST 32 Water, water everywhere: Role of the water analyst in 19th. century England
Harold Goldwhite, Chemistry and Biochemistry, California State University, Los Angeles, 5151 State U. Dr, Los Angeles, CA 90032, hgoldwh@calstatela.edu

The rapid rise in urban populations in early 19th century England made the provision of safe water supplies a high priority. This is dramatically illustrated by the tale of the Broad Street pump in the cholera epidemic of 1854. As demand grew for tests that would assure the public of safe water supplies the role of the water analyst became increasingly important. One of England's leading chemists, Edward Frankland, best known for his pioneering work in organometallic chemistry and valence theory, took up this task and emerged, though not unchallenged, as the leading analyst of water supplies of his time.

HIST 33 Clean water for all: Progress of water treatment technology in the 20th Century
David A. Dzombak[1], Jeanne M. VanBriesen[1], and Joel A. Tarr[2]. (1) Department of Civil and Environmental Engineering, Carnegie Mellon University, 5000 Forbes Ave., Porter Hall 119, Pittsburgh, PA 15213, (2) Department of History, Carnegie Mellon University

Developments in water treatment technology in the 20th Century resulted in tremendous progress in reducing death and illness from waterborne diseases. The most significant development – chlorine disinfection – was implemented rapidly in industrialized nations at the beginning of the century. This disinfection technique, combined with advances in physicochemical methods (filtration, coagulation) for removing particles from water, led to widespread delivery of clear, microbiologically safe water for people living in urban areas of the industrialized world by 1950. In the second half of the century, attention shifted to more complex treatment methods for removing toxic inorganic and organic contaminants, and to effects of treatment, especially disinfection byproduct formation. Moreover, the influence of water distribution system design and management on delivered water quality became more apparent. By 2000, knowledge gained made clear the significant challenges to providing even higher quality public water and to extending drinking water treatment to the poorest areas of the world.

HIST 34 Porous polymers via macroreticular synthesis: Nature and applications
Robert Albright, Albright Consulting, 10601 Old Plantation Drive, Evansville, IN 47725

The synthesis of porous organic polymers with an open cell structure and a permanent pore system that does not collapse on drying was discovered by Eric Meitzner and James Oline in 1957. The term these scientists applied to such polymers with a noncollapsible, permanent pore system is macroreticular in order to differentiate them from the prior cross-linked gel polymers. Gel polymers have a porosity only when solvated or swelled by a miscible liquid and are called microreticular. The selectivity of a sorbent for a specific molecular species is a function of the surface nature, where the simple concept of “like sorbs like” is operative, and the capacity, which is a function of the accessibility of the binding surface to the sorbate. These two fundamental requirements dictate that the polymeric sorbent must have selective sites and accessible sites. Accessibility distills down to an interconnecting system of pores of the proper size for good mass transport from the particle exterior to the particle interior. Capacity pores are the smaller pores connected into the mass transport pore system so that the sorbate can interact with the sorbent surface for binding. An understanding of the interplay among surface selectivity, mass transport, and site accessibility will be presented as the guiding principles for building and applying the most appropriate porous polymeric adsorbent for performing the desired chemical work.

HIST 35 Historical perspective on ion exchange resin technology for water purification
Rajiv Banavali and Scott Boyce, Process Chemicals, Rohm and Haas Company, 727 Norristown Rd., Spring House, PA 19477, rbanavali@rohmhaas.com

The use of Ion Exchange Resins technology for the treatment of water spans nearly seven decades. From its early days of use for softening water, ion exchange technology has come a long way from both the synthesis and manufacture of resins to employment in varied applications such as the delivery of high purity water required by the semiconductor industry and potable water that is free of toxins. This paper will examine the history of ion exchange resin technology from both academic and industrial points of view.

HIST 36 Arsenic, nitrate, and perchlorate in water: Dangers, distribution, and removal
Dean F. Martin, Department of Chemistry, University of South Florida, 4202 E. Fowler Avenue, SCA 400, Tampa, FL 33620, Fax: 813-974-8756, dmartin@cas.usf.edu, Barbara B. Martin, Department of Chemistry, University of South Florida, and Robert Alldredge, Metre-General, Inc

Arsenic contamination of groundwater supplies has become a wide-spread problem, owing to its toxicity and carcinogenic problems. The problem is worldwide, but especially serious in Bangladesh. In the United States, a number of water-supply agencies were faced with the demand for reduction of arsenic concentrations in drinking water from 50 to 10 ppb starting in January, 2005. Nitrate is thought to be the most common chemical contaminant in the world's water supplies; it is of concern because of methemoglobinemia (“blue baby syndrome”) and because nitrate is a precursor in the formation of N-nitroso compounds (carcinogens). Perchlorate in a water supply represents a concern because as little as 5 ppb can cause growth retardation in children since perchlorate ion is an antagonist to thyroxin. These three species represent a challenge to chemists and engineers to provide economical means of removing them from water.

HIST 37 Arsenic crisis on the Indian subcontinent: A sustainable solution and the role of chemistry
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In Bangladesh, Vietnam, the eastern part of India, Thailand, Argentina and Mongolia, drinking water drawn from underground sources has been responsible for widespread arsenic poisoning affecting millions. Although the genesis of arsenic contamination is yet to be fully understood, natural geochemical weathering of subsurface soil is the sole contributor of dissolved arsenic in groundwater. To this end, the collaborative work between Lehigh University in Pennsylvania, USA, and Bengal Engineering College in West Bengal, India, has been directed toward providing arsenic-free water in remote villages in affected areas bordering Bangladesh and India. During the last nine years, one-hundred and fifty operationally simple, low-cost arsenic removal units have been installed at the existing wells to ensure a supply of safe drinking water. This paper illustrates how the design of sustainable treatment systems takes advantage of chemical principles to attain the highest arsenic removal efficiency with minimum environmental impact and operational complexity.

HIST 38 Looking back: Eighty-five years of chemists and their history
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Founded by Edgar Fahs Smith and Charles A. Browne, the Division of the History of Chemistry (HIST) of the American Chemical Society was formed to provide chemists with a means of exploring their history in a comfortable forum, surrounded by other chemists who shared their enthusiasm. For more than eight decades HIST has served this purpose while expanding its role, reaching out to non-chemists, organizing specialized programming, founding and publishing a journal, encouraging research, and honoring the field's leaders through its awards. Focusing originally on alchemy and the origins of modern chemistry in the eighteenth century, HIST programming has changed to reflect a substantial interest in the newer developments of the twentieth century as chemistry matured into a science that has spawned many new substantial disciplines in their own right. Throughout this period, HIST has maintained its strong ties to chemical education where history can be an effective tool in a teacher's repertoire.

HIST 39 Communicating the history of chemistry
Paul R. Jones, Department of Chemistry, University of Michigan, 930 N. University, Ann Arbor, MI 48109-1055, Fax: 734-647-4865, prjones@umich.edu

The fascination of chemists for their history has been manifested in the form of numerous books, some written even before the beginning of the 19th century. Hermann Kopp's comprehensive history of chemistry of 1843 set the standard for generations of books emanating from Germany, Great Britain, and the US in the succeeding century. Periodicals of history of science have typically included limited coverage of chemistry, examples being Isis, Osiris, Annals of Science, and Bulletin for the History of Science. Ambix, founded in 1937, is devoted entirely to chemistry and alchemy, as was Chymia, founded a few years later. A change in editorial policy at the Journal of Chemical Education, where papers on the history of chemistry and HIST appeared frequently in its first several decades, was one of the motives for the founding of the Bulletin for the History of Chemistry in 1988. Historians of chemistry are now challenged with making the most of the potential of technological advances in communicating their field.

HIST 40 What's history got to do with a newsmagazine?
Rudy M. Baum, Editor-in-Chief, Chemical & Engineering News, American Chemical Society, 1155 Sixteenth Street NW, Washington, DC 20036, r_baum@acs.org

Chemical & Engineering News prides itself on being “the newsmagazine of the chemical world.” However, communicating new developments in chemistry requires placing them in some historical context. And some of the most well-received features in C&EN in recent years have been historical examinations of developments in the chemical enterprise. I will discuss how C&EN editors decide on the appropriate historical context for stories and how some of the historical features were developed.

HIST 41 Role of HIST in the history of chemistry
Jeffrey I. Seeman, SaddlePoint Frontiers, 12001 Bollingbrook Place, Richmond, VA 23236, jiseeman@yahoo.com

The Division of the History of Chemistry (HIST) of the American Chemical Society is not solely a witness and a “place” to discuss the history of chemistry. HIST is an active participant as well. As a special partner in these enterprises, HIST influences not only the field of the history of chemistry but also chemistry itself. Examples from the most recent past, current HIST plans, and future possibilities will be provided as illustrations of this dynamic synergy.

HIST 42 Role of history and the Division of the History of Chemistry in the American Chemical Society
Denise Creech, American Chemical Society, 1155 Sixteenth Street, NW, Washington D.C, DC 20036, d_creech@acs.org

This paper will explore the dynamic interplay between history, the Division of History of Chemistry and the American Chemical Society. History and HIST Division have clearly affected the growth and development the American Chemical Society. Similarly, the programs, products, and services provided by the American Chemical Society have helped shape the history of the chemical enterprise as well as the HIST Division. As we study and celebrate the past, what can we learn from it and what does it portend for the future of HIST and ACS?

HIST 43 Future of the past: Intellectual and structural issues
Arnold W. Thackray, Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106-2702, Fax: 215-925-9377, athackray@chemheritage.org

As science and technology change, and change our lives, many complex issues arise in relation to our study of the past. What value does history possess, and to whom? To what extent is disciplinary history viable? What agencies and strategies should we seek to encourage? This talk will offer some reflections and suggestions, in the hope of stimulating a broader and deeper reflection on the opportunities and challenges that lie ahead.

HIST 44 Looking ahead: Keeping history of chemistry relevant to the future of chemistry
Carmen J. Giunta, Department of Chemistry and Physics, Le Moyne College, 1419 Salt Springs Rd, Syracuse, NY 13214-1399, Fax: 315-445-4540, giunta@lemoyne.edu

As the discipline of chemistry develops, it provides new material for its historians to document, understand, and explain. As a field of scholarship, history of chemistry must react to such developments. HIST and other individuals and organizations concerned with the history of chemistry also have a stake in shaping the future of chemistry. Interpreting the past into educational materials, celebrating accomplishments of the recent past, and placing current questions into historical perspective are among the ways that history of chemistry can inform and inspire current and future chemists. Examples of such activities will be given from the recent past and foreseeable future.

HIST 45 New developments in the history and philosophy of the periodic system
Eric Scerri, Department of Chemistry and Biochemistry, University of California-Los Angeles, 607 Charles E. Young Drive East, Los Angeles, CA 90095-1569, Fax: 310-206-2061, scerri@chem.ucla.edu

The presentation will examine some recent discussions among historians and philosophers concerning whether there it is meaningful to speak of a 'best form' of the periodic table and will examine some of the recently proposed forms. I will also consider recent work on the nature of elements as "basic substances", to use Paneth's terminology, and the notion of atomic number triads and their significance.

HIST 46 Joint papers of Alfred Werner and Paul Karrer
Dean F. Martin, Department of Chemistry, University of South Florida, 4202 E. Fowler Avenue, SCA 400, Tampa, FL 33620, Fax: 813-974-8756, dmartin@cas.usf.edu, and Barbara B. Martin, Department of Chemistry, University of South Florida

At a Division Symposium in September 2006, a speaker noted that Paul Karrer worked for Alfred Werner (the founder of modern coordination chemistry) for three years, but none of his work was ever published. This absence of publication seems curious. According to some views, Karrer was one of Werner's two best students; afterward, he embarked in a new area of research for which he received a Nobel Prize (1937). And it is evident that Karrer had a very high regard for his mentor from the tributes that were published in 1920 (after Werner's death) and in 1967, following the celebration of the centennial of Werner's birth. The background of joint publishing may account for one evident absence, and Werner's failing health due to onset of arteriosclerosis may be another reason. But two joint papers were found in the literature.

HIST 47 Xenon: Strange one
Keith Kostecka, Science and Mathematics Department, Columbia College - Chicago, 600 S. Michigan Avenue, Chicago, IL 60605, Fax: 312-344-8051, kkostecka@colum.edu

Xenon has proven itself to be the “strange one” from its discovery by Ramsay and Travers in 1898 to its applications and the chemistry of its compounds as discovered by Bartlett and others. Discussion of the characteristics of this element, the synthesis, properties and uses of the principal xenon compounds and the use of Xenon-129 for enhanced magnetic resonance imaging will be offered.

HIST 48 Obiter Research LLC: Six years down the road
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Obiter Research LLC was started in 2000. Obiter Research, LLC is a private company dedicated to three business areas - kilo-scale fine chemicals, contract synthesis / custom manufacturing, and in-house research. Obiter Research offers custom manufacturing services from gram to multi-kilo scale. Obiter Research has 150-liter reactors that can provide 50 kg capacity, depending upon the chemical and the manufacturing method. Obiter Research's in-house expertise is enhanced by its access to the top ranked University of Illinois at Urbana-Champaign (UIUC) library and facilities as well as by its professional association with UIUC faculty. Obiter Research's products are typically difficult to produce and are therefore rare to find. The products manufactured at Obiter Research are used for intermediates in the pharmaceutical industry, for research, and for other specialty uses such as genomics and proteomics. July 20, 2006, marked the groundbreaking ceremony for our new building that will be going up over the next few months. This was a landmark day in the history of Obiter, the first step to being out on our own.

HIST 49 Carbohydrate research at the USDA Laboratory in Peoria, Illinois
Gregory L. Côté, Bioproducts and Biocatalysis Research Unit, USDA ARS National Center for Agricultural Utilization Research, 1815 N. University St., Peoria, IL 61604, Fax: 309-681-6040, cotegl@ncaur.usda.gov, and Victoria L. Finkenstadt, Plant Polymer Research, National Center for Agricultural Utilization Research, ARS, USDA

Founded in 1939 as one of four Regional Research Laboratories, the National Center for Agricultural Utilization Research (NCAUR) has gone by various labels over the years, including the Northern Regional Research Laboratory (NRRL) and the Northern Regional Research Center (NRRC). Although best known for its role in the development of penicillin, for which it was named an International Chemical Historic Landmark, NCAUR also has a long and distinguished history of significant contributions to the field of applied carbohydrate chemistry. Developments by carbohydrate researchers at NCAUR include dextran, leucrose, xanthan gum, phosphomannans, superabsorbent starch copolymers, Trim technologies, Fantesk, sucromalt, and key contributions to the production of high-fructose corn syrup, to name just a few. NCAUR carbohydrate scientists have been recipients of various awards for their work, including the Garvan medal, Wolfrom award, Isbell award, several R&D 100 awards, the Illinois Order of Lincoln award, and a number of USDA departmental awards. We will present a description of past accomplishments in the field of carbohydrate chemistry, and a brief overview of current activities, focusing on how and why Peoria, Illinois, became an international center for applied carbohydrate science.

HIST 50 USDA, Agricultural Research Service: Research for the growing world
Renée M. Wagner, Office of Technology Transfer, USDA, Agricultural Research Service, 1815 N. University St., Peoria, IL 61604, Fax: 309-681-6688, wagnerrm@ncaur.usda.gov, and Katherine M. O'Hara, National Center for Agricultural Utilization Research, USDA, Agricultural Research Service

As the USDA's chief scientific research agency, the Agricultural Research Service (ARS) conducts research to develop and transfer solutions to agricultural problems of high national priority. ARS employs approximately 2,100 research scientists in 100 research locations. The Midwest Area of ARS includes locations in 8 states, including the National Center for Agricultural Utilization Research (NCAUR) in Peoria, IL. NCAUR houses a multi-disciplinary staff working on new uses of agricultural commodities, metabolic engineering, fermentation, food safety, environmental quality, biomaterials and processing technologies. Beginning with the method to mass produce penicillin, more than 65 years of highly innovative research at NCAUR have led to the design and commercialization of technologies that have helped improve the quality of life today. ARS partners with universities, private industry, and other government agencies in order to augment research programs, transfer research results to the consumer and improve the quality of life for all Americans.

HIST 51 DSM Desotech: Pioneer in radiation curing technology
Anthony J. Tortorello and Timothy E. Bishop, DSM Desotech, Inc, 1122 St. Charles Street, Elgin, IL 60120, Anthony.Tortorello@dsm.com

With its roots going back to DeSoto, Inc. on Kostner Ave. in Chicago, DSM Desotech has distinguished itself as a pioneer in radiation curable coating technology. This technology has been utilized by Desotech in the development of highly specialized coatings for the optical fiber industry, thereby enabling modern telecommunications and the internet. The company is also a world leader in stereolithography and has broad experience in many specialized radiation curable coating applications. DSM Desotech has a long and rich history of custom development of radiation curable products that meet stringent customer requirements.

HIST 52 Rise and fall of the Chicago white lead industry
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Chicago was home to a large number of white lead paint manufacturers in the latter half of the 1800s and early 1900s. This talk traces the rise and fall of the industry. Favorable factors contributing to the rise of the industry were the competitive transportation rates driven by multiple forms of transportation (lake and rail). The decline of the industry resulted in efforts of risk containment leading to "poison pill" donations of land to local charities and ultimately to the rise of the brown fields initiative. These several strands of history will be woven together to give an integrated view of the life cycle of a local chemical industry.

HIST 53 Still Nalco after all these years
Kenneth P. Fivizzani, Nalco Company, 1601 West Diehl Road, Naperville, IL 60563

In 1928, the Chicago Chemical Company merged with the Aluminate Sales Corporation to form the National Aluminate Corporation, which eventually became known as Nalco Chemical Company. In exchange for Nalco stock, the Aluminum Company of America (Alcoa) provided the new company with sodium aluminate technology as well as its municipal water treating accounts. During 1929, Visco Products Company began selling products to the oil industry. From a core technology in industrial water treatment, Nalco developed products and programs for the pulp and paper, mining, automotive, catalyst, metal finishing, and petroleum industries. Key technologies developed at Nalco include an electrolytic process to make lead antiknock additives, novel synthetic processes for latex polymers, and monitoring of product levels using naturally occurring or added fluorescent materials. In 1999, Suez purchased Nalco, and the company's name was changed to Ondeo Nalco to reflect branding with other Suez environmental companies. In 2003, Suez sold Nalco to a consortium of three financial investment companies who saw Nalco as a consistent provider of essential industrial services. Following an Initial Public Offering in 2004, the renamed Nalco Company is again an independent, publicly traded corporation using both traditional and new technology to stretch our customers' energy and water dollars.

HIST 54 College of DuPage: Chemistry at a premier community college
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College of DuPage, a very large community college in suburban Glen Ellyn, will celebrate its 40th anniversary next fall. From its start in numerous sites around the district to the current campus, the college and the chemistry program have developed into a nationally recognized institution and a well-regarded department. The chemistry program has grown from local high school chemistry laboratories to the existing facilities with a state-of-the-art building scheduled to open in the spring of 2009. We are at the forefront of education for the first and second year of undergraduate education and are recognized for producing well-prepared students who transfer to senior institutions to complete their education.

HIST 55 Founding of the Loyola University Chicago Chemistry Department
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The Chemistry Department of Loyola University Chicago had its beginnings in St. Ignatius College, 418 West 12th Street, Chicago, IL. This college established in 1870 was modeled after the European system of education. The St. Ignatius College curriculum had a Classics Degree, a Commercial Degree and a Science Degree. Chemistry was offered in all three curricula in the second and third years as part of the Physics offering. St. Ignatius College grew, which necessitated that it move to a larger campus – the Lake Shore Campus. At this time St. Ignatius College reincorporated and switched from its six-year European to the American format and changed its name to Loyola University. Following WWII the University gave the new department chairman, Raymond P. Mariella, the mandate to rebuild the Chemistry Department. He instituted a program that put a strong but equal emphasis on both teaching and research. The Loyola Chemistry Department has a current faculty of 13 tenured members, nine full-time non-tenured members and one part-time member.

HIST 56 Chemistry in an arts, media and communications environment
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The Science and Mathematics department provides the opportunity for Columbia students to learn fundamental scientific and mathematical concepts in an atmosphere that cultivates intellectual curiosity, creative and artistic exploration, independent thinking, and ethical global citizenship. The department offers a wide array of courses in biology, chemistry, earth sciences, ecology, nutrition and health, interdisciplinary sciences, physics, and mathematics. The focus of this

presentation, however, is on the chemistry experiences included in the curriculum. The department does not offer any majors. However, a minor in Environmental Science is offered that gives students a basic understanding of environmental issues from a scientific, legal, social and political context. The faculty members are active professionals in the fields they are teaching. Many have artistic backgrounds in addition to advanced degrees in science and mathematics. These professors, through insightful teaching and careful guidance, help students develop meaningful and lasting connections with science and mathematics, while providing invaluable skills for living more interesting, productive, and well-rounded lives.

HIST 57 IMSA - A unique experience for Illinois high school students
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IMSA - The Illinois Mathematics and Science Academy is an internationally-recognized pioneering educational institution created by the state of Illinois to develop talent and leadership in mathematics, science and technology. IMSA offers a uniquely challenging education for Illinois students in grades 10 -12 talented in the areas of mathematics and science. Tuition and most room and board expenses are provided by state funds. The 650 students who are enrolled in the three-year residential program participate in a unique approach to learning that is problem-centered, inquiry-based and integrative. Advanced courses emphasize connections across the disciplines. With the objective of growing the State's supply of technical and scientific leaders front and center, the science team at IMSA has continuously updated the curriculum to achieve the very best experience for the matriculating students. The presentation will review the evolution of the chemistry experience afforded students from the opening in 1986 to the present.

HIST 58 Learning and lecturing preferences: Description of an incoming PharmD class
Robin M. Zavod, Department of Pharmaceutical Sciences, Midwestern University Chicago College of Pharmacy, 555 31st Street, Downers Grove, IL 60515, Fax: 630-515-6958, rzavod@midwestern.edu, David P. Zgarrick, Department of Pharmacy Practice, Midwestern University Chicago College of Pharmacy, and Chan Duong, Alumni, Midwestern University Chicago College of Pharmacy

Objectives: Evaluate preferences of a student cohort prior to exposure to a professional pharmacy program. Methods: A survey assessing learning and lecturing preferences was developed and tested. The survey was administered to an incoming class of students within the first week of their pharmacy program. Survey items evaluated lecturing preferences, including type of lecture, as well as presentation and assessment styles. Student preference for learning activities/methods, including non-lecture activities and methods to receive additional assistance were assessed. Results: Statistical tests provided descriptive cohort information. Practice problems and lecture were preferred activities, active and passive lecturing were equally desirable, visual and kinetic were favored learning methods and multiple choice and short answer questions were perceived as the best assessments. Other students were the preferred source of assistance and office visits and e-mail were favored to get questions answered. Implications: Faculty awareness of learning and lecturing preferences promotes tailoring of classroom-based strategies.

HIST 59 Martin Kilpatrick's chemistry legacy at IIT
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In 1947 Martin and Mary Kilpatrick came to IIT to build an Undergraduate and Graduate chemistry program at IIT. Martin retired in 1960 having brought the Chemistry Department to 24 T/TT faculty (from six), 100 UG majors, 80 postdocs and graduate students and a tradition of UG and G research with emphasis on quality UG chemistry education. He was succeeded by Arthur Martell who after a few years relocated to Texas A & M where Arthur quickly tripled the faculty and the physical plant for chemistry. Chemistry at IIT has undergone several changes with the merger of biology and chemistry into one department in 1993 (unconsummated) followed by a major reorganization of IIT in 1995 including the unilateral merger of the Chemistry and Biology Department with the Physics Department forming the Biological, Chemical and Physical Sciences Department. In 1959 Chemistry at IIT introduced major programs in the evolving discipline of computer science; first within chemistry at IIT; then throughout IIT; and finally internationally including in the ACS.