



American Chemical Society  
Division of the History of Chemistry

## **Program and Abstracts**

235<sup>th</sup> ACS National Meeting  
New Orleans, LA  
April 6-10, 2008

J. S. Jeffers, Program Chair

**DIVISION OF THE HISTORY OF CHEMISTRY**

# HIST

## DIVISION OF THE HISTORY OF CHEMISTRY

Final Program, 235th ACS National Meeting, New Orleans, LA, April 6-10, 2008

J. S. Jeffers, *Program Chair*

**Monday: HIST Strategic Planning Meeting- No Programming**

### SUNDAY MORNING

Marriott Convention Center — **Fulton** <http://www.marriott.com/hotels/event-planning/floor-plans/msymc-new-orleans-marriott-at-the-convention-center/>

#### General Papers

J. S. Jeffers, *Organizer, Presiding*

**9:00** —1. George K. Fraenkel: Pioneer of electron spin resonance. **I. Bernal**

**9:30** —2. Effects and perspectives of the chemistry of porcelain on the history of china. **T. G. Barrera**

**10:00** —3. Should chemistry undergraduates study engineering? Early 20th century debate. **R. A.**

**Egolf**

**10:30** — Intermission.

**10:45** —4. French winners of the Nobel Prize in Chemistry from 1901-1935. **K. Kostecka**

**11:15** —5. Winstein's 1957 Baker Lectures: Physical organic text that never was. **H. Goldwhite**

### SUNDAY AFTERNOON

Marriott Convention Center — **Fulton** <http://www.marriott.com/hotels/event-planning/floor-plans/msymc-new-orleans-marriott-at-the-convention-center/>

**Women Chemists in the National Inventors' Hall of Fame: Telling Their Stories** *Cosponsored by CHED, TECH, WCC, and IEC*

M. V. Orna, *Organizer, Presiding*

**1:30** — Introductory Remarks.

**1:35** —6. Elizabeth Lee Hazen and Rachel Fuller Brown: A remarkable collaboration in the discovery and purification of Nystatin. **M. V. Orna**

**2:00** —7. Gertrude Elion and the birth of rational drug design. **M. Michalovic**

**2:25** —8. Experiences of an industrial chemist. **E. Flanigen**

**2:50** — Intermission.

- 3:00** —**9.** Serendipity, chemistry, and me. **H. M. Free**  
**3:25** —**10.** Stephanie Louise Kwolek: "Guy" who invented Kevlar. **J. M. Hayes**, P. L. Perez  
**3:50** —**11.** Chance favors the prepared mind: Unplanned experimental results can lead to products that enhance the quality of our lives. **P. O. Sherman**  
**4:15** —**12.** Creativity and serendipity in the workplace. **M. V. Orna**, **E. Flanigen**, **H. M. Free**, **P. O. Sherman**  
**4:40** — Concluding Remarks.

**Past, Present and Future of the Kilogram**  
*Cosponsored by HIST*

*Sponsored by CINF,*

## MONDAY EVENING

Morial Convention Center — **Hall A** [http://www.mccno.com/AttendAnEvent\\_GeneralFloorPlan.asp](http://www.mccno.com/AttendAnEvent_GeneralFloorPlan.asp)

### Sci-Mix

J. S. Jeffers, *Organizer*

**8:00 - 10:00** — **2.** See previous listings.

## TUESDAY MORNING

Marriott Convention Center Center — **Fulton** <http://www.marriott.com/hotels/event-planning/floor-plans/msymc-new-orleans-marriott-at-the-convention-center/>

**A Festival of Chemistry Entertainments**  
*Society*

*Cosponsored by Bolton*

J. Stocker, *Organizer, Presiding*

**9:00** — Introductory remarks to set the mood.

**9:10** —**13.** Reese's Pieces: "Best" of C&EN newsprints written by K. M. Reese. **W. F. Carroll Jr.**

**9:40** —**14.** Letters to C&EN's Editor: The good, the bad, and the ugly. **R. M. Baum**

**10:10** — Intermission.

**10:25** —**15.** Are the versed scientific papers among the best? **J. Bunnett**

**10:55** —**16.** Intriguing records in CAS databases. **J. E. Mears**, R. J. Schenck

**11:25** —**17.** Curriculum witty: Chemistry in verse and song. **H -Y. Shapiro**

## TUESDAY AFTERNOON

Marriott Convention Center Center — **Fulton** <http://www.marriott.com/hotels/event-planning/floor-plans/msymc-new-orleans-marriott-at-the-convention-center/>

**A Festival of Chemistry Entertainments**  
*Bolton Society*

*Cosponsored by*

J. Stocker, *Organizer, Presiding*

**2:00** —**18.** Always a cross(ed) word. **M. V. Orna**

**2:30** —**19.** Rotten reviews. **D. Davenport**

**3:00** —**20.** From the pens of thirsty chemists and the occasional cat: Chemists' humor in publications.  
**N. Foster**

**3:30** — Intermission.

**3:45** —**21.** ACS history in personal political debates (both p and P). **M. L. Good**

**4:15** —**22.** A small cornucopia of miscellaneous whimsy. **J. Stocker**

## ***Abstracts***

### **HIST 1 George K. Fraenkel: Pioneer of electron spin resonance**

**Ivan Bernal**, Chemistry Department, City University of New York, Hunter College and Research Center, New York, NY 10021,

[i-bernal@sbcglobal.net](mailto:i-bernal@sbcglobal.net)

George Fraenkel was one of the pioneers of the use of electron spin resonance to address a broad range of chemical problems. This was an interesting time for chemists to avail themselves of technologies developed during the war, for example, microwave technology, which allowed the extension of spectroscopy into that frequency range. George built his own esr spectrometer using an ingenious and unusual design, different from that generally adopted by others and by commercial instruments that followed, such as the Varian spectrometer. However, he was interested in and actively participated in research in other areas, such as theoretical chemistry, e.g. the Karplus-Fraenkel theory of spin densities in paramagnetic organic molecules and extensions thereof. Interestingly, his doctoral thesis was in theoretical chemistry and his director was Peter Debye. Other aspects of his versatile scientific life will be presented.

### **HIST 2 Effects and perspectives of the chemistry of porcelain on the history of china**

**Thor Gruman Barrera**, Department of Chemistry, Sacramento State University, 6000 J St., Sacramento, CA 95819,

[thorbarrera@yahoo.com](mailto:thorbarrera@yahoo.com)

In 1793, when the British crown sent George McCartney with an envoy to China to open trade agreements, one of the many goods he brought with him was porcelain wares. Little did he know, the Chinese already produced high quality porcelain. As a result, this became a cause of conflict between China and Britain. The British would later force China into trade. When China tried to resist, the British seized the opportunity to attack and crushed the Chinese military, taking Hong Kong for themselves. This research shows the role of chemistry in this history, provides a chemical definition of the quality/value of porcelain, projects a methodology by which to analyze and identify Qing porcelain to validate its authenticity, and postulates what the possible "secret" chemical component is in Chinese porcelain.

### **HIST 3 Should chemistry undergraduates study engineering? Early 20th century debate**

**Roger A. Egolf**, Pennsylvania State University, Lehigh Valley Campus, 8380 Mohr Lane, Fogelsville, PA 18051-9999, Fax: 610 285-5220, [rae4@psu.edu](mailto:rae4@psu.edu)

A century ago debate raged over the introduction of engineering instruction into the chemistry curriculum and the creation of chemical engineering as an undergraduate major. This paper will discuss the views of prominent participants in that debate, including J. B. F. Herreshoff, Leo Baekeland, William McMurtrie, and Hugo Schweitzer.

### **HIST 4 French winners of the Nobel Prize in Chemistry from 1901-1935**

**Keith KostECKA**, Science and Mathematics Department, Columbia College - Chicago, 600 S. Michigan Avenue, Chicago, IL 60605, Fax: 312-344-8075, [kkostECKA@colum.edu](mailto:kkostECKA@colum.edu)

French scientists won the Nobel Prize in Chemistry in six different years (1906, 1911, 1912, 1935, 1987 and 2005). This presentation will look at the efforts of the awardees from 1906, 1911, 1912 and 1935. The discussion will include: Henri Moissan (1906) and his work in the investigation and isolation of the element fluorine and in developing the electric furnace named after him; Madame Marie Curie (1911) for her work in the discovery of radium and polonium and the study of radium compounds; Victor Grignard (1912) for the discovery of the Grignard reagent and Paul Sabatier (1912) for his method of hydrogenating organic compounds in the presence of finely disintegrated metals; and Frederic Joliot and Irene Joliot-Curie (1935) for their work in the synthesis of new radioactive elements.

### **HIST 5 Winstein's 1957 Baker Lectures: Physical organic text that never was**

**Harold Goldwhite**, Chemistry and Biochemistry, California State University, Los Angeles, 5151 State U. Dr, Los Angeles, CA 90032, [hgoldwh@calstatela.edu](mailto:hgoldwh@calstatela.edu)

In the spring of 1957, Saul Winstein of U.C.L.A. gave the invited Baker Lecture series at Cornell University. The 24 lectures given between February and May covered topics in physical organic chemistry that were significant not only in Winstein's own work but also more generally in a topic area that was of great interest to chemists of that period. Baker Lecture presenters usually wrote a book covering the topics of their lectures. Winstein died in 1969 and no book on his lecture topics ever appeared. The author of this talk was a post-doctoral associate at Cornell in 1956-1958, working on a physical organic topic; attended Winstein's lectures; and kept a careful record of the course. This talk will outline the Winstein course in the context of physical organic chemistry in the 1950s.

#### **HIST 6 Elizabeth Lee Hazen and Rachel Fuller Brown: A remarkable collaboration in the discovery and purification of Nystatin**

**Mary Virginia Orna**, Publications Coordinator Office, Journal of Chemical Education, 16 Hemlock Place, New Rochelle, NY 10805, Fax: 914-654-5387, [mvorna@cnr.edu](mailto:mvorna@cnr.edu)

In 1994, Elizabeth Lee Hazen and Rachel Fuller Brown were inducted into the National Inventors' Hall of Fame for their invention "Nystatin (Antifungal / Antibiotic) and Method of Producing It" (U.S. Patent Number 2,797, 183; Ref. [1]). They developed the world's first useful antifungal antibiotic through a long-distance scientific collaboration. Working as researchers for the New York State Department of Health, Hazen, a mycologist and bacteriologist in New York City, and Brown, an organic chemist in Albany, shared tests and samples through the U.S. mail. To Hazen's single-minded pursuit of an antifungal antibiotic, Brown added the skills needed to identify, characterize, and purify the various substances produced by culturing bacteria found in the hundreds of soil samples they examined. This paper will tell their remarkable story.

#### **HIST 7 Gertrude Elion and the birth of rational drug design**

**Mark Michalovic**, Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106-2702, Fax: (215) 925-1954, [markm@chemheritage.org](mailto:markm@chemheritage.org)

Before the double helical structure of DNA had even been elucidated, Gertrude Elion along with George Hitchings began working to develop drugs that would interfere with the ability of cancer cells to incorporate purine bases into their DNA. Their strategy to jam the system with purine-derived compounds not only led to the discovery of new chemotherapeutic agents like 6-mercaptopurine and immunosuppressive drugs like Imuran, but also ushered in a new age of drug discovery, in which medicines were not discovered by trial-and-error but were invented based on a thorough understanding of the biochemistry of disease. This approach of rational drug design led Elion to invent many more new medicines, including the first antiviral drugs. It also earned her and Hitchings the Nobel Prize for Medicine or Physiology in 1988.

#### **HIST 8 Experiences of an industrial chemist**

**Edith Flanigen**, UOP (retired), 502 Woodland Hills Road, White Plains, NY 10603, Fax: None, [edith.flanigen@uop.com](mailto:edith.flanigen@uop.com)

This paper will document the first-person story of the research career of Edith Flanigen, who attained international prominence for her work in the fields of silicate chemistry and the chemistry of zeolites and molecular sieve materials. Her accomplishments include synthesizing new molecular sieve materials for application as adsorbents and catalysts; inventing the hydrothermal emerald synthesis process; and pioneering the use of mid-range infrared spectroscopy for interpreting zeolite structures. She led the Union Carbide Research Group that discovered new generations of molecular sieve materials in the late 70's and 80's, including families of aluminophosphates, silicoaluminophosphates, and other novel molecular sieves. Flanigen has authored or co-authored over 36 publications and has been granted 108 U.S. patents.

She attributes her success as an industrial scientist and an inventor to a number of key factors: a creative and exciting research environment; a supportive research and business management focused on discovery and innovation; an aggressive patent strategy and support team; research colleagues of the highest caliber and creativity; a team approach to research; hard work; and a little bit of luck.

#### **HIST 9 Serendipity, chemistry, and me**

**Helen M. Free**, Diabetes Care Division, Bayer HealthCare, 1884 Miles Ave., Elkhart, IN 46514, [hmfree23@aol.com](mailto:hmfree23@aol.com)

There are several points in my life in which serendipity played a huge part. I've always envied those chemists who wanted to be a chemist ever since they received a chemistry set for Christmas. On the other hand, I started college in September, 1941, expecting to be a Latin/English teacher. And when my housemother asked if I would switch my major to chemistry, I just said "OK." Serendipity Number 1. As a senior 3 years later, I applied for a research fellowship at Carnegie-Mellon Institute. When I didn't hear from them, I accepted a position as a control chemist at Miles Laboratories, and I started the day after graduation. Just about two weeks later, Carnegie -Mellon wrote that I'd been accepted for the fellowship. Serendipity Number 2. I had been talking to my boss at Miles about getting into research instead of boring quality control, so when Miles started a biochemistry research section, I interviewed with the biochemistry head, and two years later, I married him. Serendipity Number 3.

The rest of my story is how the US diagnostics industry was begun in Elkhart, Indiana, by Al Free and a hundred or so other scientists, including me, and my role in developing the urine tests for diabetes.

#### **HIST 10 Stephanie Louise Kwolek: "Guy" who invented Kevlar**

**Janan M. Hayes**, Project Inclusion, P.O. Box 8542, Citrus Heights, CA 95621, [jmhayes@earthlink.net](mailto:jmhayes@earthlink.net), and Patricia L. Perez, Project Inclusion, San Dimas, CA 91773

Stephanie Kwolek is best known as the inventor of Kevlar (used in bulletproof vests, brake pads, etc.), but there is much more to this fourth woman inducted into the National Inventors Hall of Fame (1995). Kwolek graduated from Carnegie Institute of Technology (1946) in Pittsburgh, PA, and sought temporary employment at the DuPont Company. She did not leave until her retirement (1986). Kwolek's earliest work was developing low-temperature processes for the preparation of condensation polymers, resulting in hundreds of new materials. Next, she worked in the area of stronger, stiffer liquid crystal polymers, e.g., Kevlar. Kwolek became an expert in research on synthetic polymeric materials with great strength. Kwolek was known for her careful, persistent, conscientious approach to research. As a result, her name is on 17 patents from 1961-86. In addition, Kwolek is noted as a mentor for other women scientists and a participant in programs that introduce young children to science.

#### **HIST 11 Chance favors the prepared mind: Unplanned experimental results can lead to products that enhance the quality of our lives**

**Patsy O. Sherman**, 3M (retired), 9401 Lyndale Avenue South, #417, Bloomington, MN 55420, Fax: None, [patsherman@aol.com](mailto:patsherman@aol.com)

It is often said that necessity is the mother of invention and that is certainly true - much of the time. However, many of the products we take for granted today, and can't imagine living without, had their beginnings not by design and identified need. They burst upon and changed our lives as the result of an accident, an unplanned experimental result, an unanticipated and unexplainable observation, or some other unexpected event. Penicillin, vulcanized rubber, Velcro, high density polyethylene, and self-locking nuts and bolts are just a few examples. The invention of the first Scotchgard products resulted from an accidental laboratory spill that redirected our efforts from trying to make a fuel resistant aircraft hose to making stain repellent fabrics.

#### **HIST 12 Panel discussion: Creativity and serendipity in the workplace**

**Mary Virginia Orna**, Publications Coordinator Office, Journal of Chemical Education, 16 Hemlock Place, New Rochelle, NY 10805, Fax: 914-654-5387, [mvorna@cnr.edu](mailto:mvorna@cnr.edu), Edith Flanigen, UOP (retired), White Plains, NY 10603, Helen M. Free, Diabetes Care Division, Bayer HealthCare, Elkhart, IN 46514, and Patsy O. Sherman, 3M (retired), Bloomington, MN 55420

Three women inventors, Edith Flanigen, Helen Free, and Patsy Sherman will interact with each other and with the audience on the subjects of invention, creativity, discovery, entrepreneurship, and serendipity.

#### **HIST 13 Reese's Pieces: "Best" of C&EN newsreels written by K. M. Reese**

**William F. Carroll Jr.**, Occidental Chemical Corporation, 5005 Lyndon B. Johnson Freeway, Dallas, TX 75244-6100, Fax: 972-404-2845, [bill\\_carroll@oxy.com](mailto:bill_carroll@oxy.com)

Chemical and Engineering News (C&EN), known as the preferred source of information about the chemistry enterprise, took its mission seriously enough to include chemical whimsy in its reportage. Newsprints has brought us the other side of the news on the back page of C&EN since 1943. Ken Reese, 50 years in the Publications Division and over 50 years as an ACS member at the time of his retirement in 2004, was not the first steward of this regular column, nor is he the last, but his work sets the standard. This paper highlights some of the author's favorite Reese postings as a tribute to a legend.

#### **HIST 14 Letters to C&EN's Editor: The good, the bad, and the ugly**

**Rudy M. Baum**, Editor-in-Chief, Chemical & Engineering News, American Chemical Society, 1155 Sixteenth Street NW, Washington, DC 20036, [r\\_baum@acs.org](mailto:r_baum@acs.org)

The readers of *Chemical & Engineering News* - that is, the members of ACS - are a marvelously diverse collection of professionals. The letters they write to the editor of C&EN reflect that diversity. In this talk, I will provide examples of the erudite, contentious, complimentary, angry, dismissive, and sometimes obsessive letters I have received in my tenure as Editor-in-Chief of the "newsmagazine of the chemical world."

#### **HIST 15 Are the versed scientific papers among the best?**

**Joe Bunnett**, Department of Chemistry & Biochemistry, University of California, Santa Cruz, CA 95064

Narration in verse was the rage  
In earlier years of our age  
Factual statements appeared  
Lucid discourse was cheered  
Pleonasm\* was simply an outrage.  
Presentation written in verse  
Is characteristically terse  
It takes so much time  
to find rhythm and thyme  
To state a truth or deny its inverse.  
\* from the Greek, "redundancy of words in speaking or writing."

#### **HIST 16 Intriguing records in CAS databases**

**Janice E. Mears**, Communications, Chemical Abstracts Service, 2540 Olentangy River Rd., Columbus, OH 43202, Fax: 614-447-3837, [jmears@cas.org](mailto:jmears@cas.org), and Roger J. Schenck, Chemical Abstracts Service, Columbus, OH 43202

In a resource as far-ranging as Chemical Abstracts and the databases to which it gave rise, there are bound to be many items of information that evoke the "you don't say" response. This presentation will discuss some of the unique, unusual, and especially interesting items of information in CAS databases. These include the shortest abstract, the longest name, the heaviest molecule, and more. Taken together, this miscellany of stand-out records in the CAS databases suggests the great variety of chemistry-related material that has come to the attention of CAS and helps to illustrate why CAS is known as an exceptional resource that reflects the varied and often unexpected character of scientific information.

#### **HIST 17 Curriculum witty: Chemistry in verse and song**

**Howard-Yana Shapiro**, Director, Plant Science & External Research, Mars, Incorporated, 6885 Elm Street, McLean, VA 22101, [howard.shapiro@effem.com](mailto:howard.shapiro@effem.com)

Tom Lehrer rhymed the elements with humor and felicity,  
But little in his ditty indicates periodicity.  
Alberto Cavaliere's book, some years before, in Italy,  
Put chemistry more accurate in verse, but just as wittily.  
Frank Gucker was the model of a modern doctor chemical,  
And built machines about which I've waxed lyric and polemical,  
The newer ones make measurements of cells stained with fluorescent  
dyes ... escent dyes, escent dyes, ...Aha!  
In rooms in which it's just as dark as when the lunar crescent dies.



What better place is there for songs, especially the secular,  
Than New Orleans? I'll sing a few, atomic and molecular,  
I'll be an unconventioneer, but nonetheless dress snazzily,  
And maybe even try to update Lehrer's song more jazzily!

#### **HIST 18 Always a cross(ed) word**

**Mary Virginia Orna**, Publications Coordinator Office, Journal of Chemical Education, 16 Hemlock Place, New Rochelle, NY 10805, Fax: 914-654-5387, [mvorna@cnr.edu](mailto:mvorna@cnr.edu)

This presentation will initiate the audience into the creation of scientific crossword puzzles, keeping in mind that research is first and foremost the most important first step. Audience participation will be requested, but not required. Beware of missteps and sneaky clues. The puns may be painful but the humor will be priceless.

#### **HIST 19 Rotten reviews**

**Derek Davenport**, Department of Chemistry, Purdue University, 560 Oval Drive, West Lafayette, IN 47907-2084

In many ways, scientific publishing is akin to the Bermuda Triangle: the editor, the reviewer, and the author(s) occupying the vertices of the triangle, each with well-delineated lines of responsibility and civilized communication. We will concentrate on the murky interior of the triangle where mayhem often reigns.

#### **HIST 20 From the pens of thirsty chemists and the occasional cat: Chemists' humor in publications**

**Natalie Foster**, Department of Chemistry, Lehigh University, 6 East Packer Ave, Bethlehem, PA 18015, Fax: 610-758-3536, [nf00@lehigh.edu](mailto:nf00@lehigh.edu)

We all know chemists have a sense of humor, but we don't usually look for evidence of it in formal publications. This presentation will explore items from the published literature where chemists as authors of serious publications have slipped in elements of humor ranging from the fanciful (a cat as a co-author?) to down-right enlightened (Berichte der durstigen chemischen Gesellschaft), perhaps the single most impressive prank in the chemical literature.

#### **HIST 21 ACS history in personal political debates (both p and P)**

**Mary L. Good**, College of Information Science and Systems Engineering, University of Arkansas, 2801 South University Ave., Little Rock, AR 72204, Fax: 501-569-8002, [mlgood@ualr.edu](mailto:mlgood@ualr.edu)

The official posture of the American Chemical Society is that it is a society of professional members devoted to the discipline of chemistry and the well-being of chemists. It professes to be politically non-partisan and advocates for its policies on a non-political basis. It also professes to accepting application for membership based on professional credentials. However, over the years the Society has been buffeted by events that challenge this non-political stance. Several of these incidents have involved prominent scientists, some of whom have been ACS members. We will explore some of these cases and discuss their impact on ACS and how they relate to current issues facing the Society.

#### **HIST 22 A small cornucopia of miscellaneous whimsy**

**Jack Stocker**, University of New Orleans, 2224 Royal Street, New Orleans, LA 70117, Fax: 504-280-6860

The speaker will provide examples of

- (a) whimsical chemical structures with their proposed nomenclature,
- (b) useful devices for teaching the prefix orders of ten,
- (c) some additional Guinness records, not from CAS,
- (d) noteworthy authorships,
- (e) notable acronyms,
- (f) amusing references,
- (g) and any related bits of whimsy other festival representative's couldn't find time for.