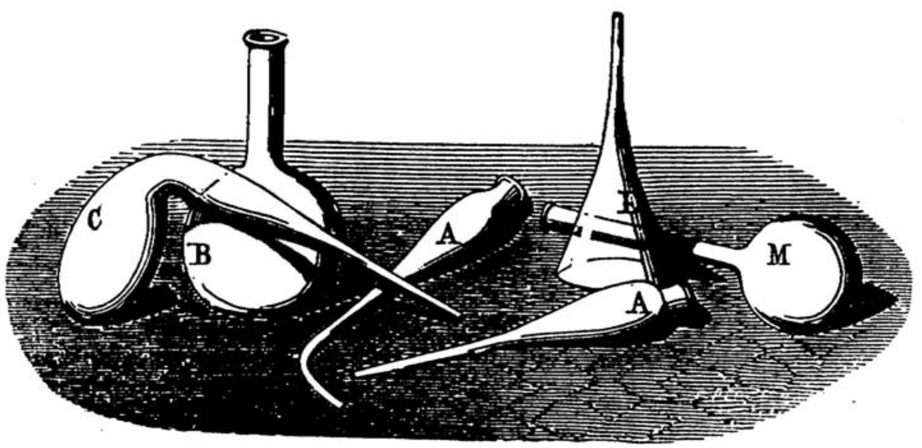
American Chemical Society

Division of the History of Chemistry



Abstracts

242nd ACS National Meeting
Denver, CO
August 28 - September 1, 2011

S. C. Rasmussen, Program Chair

DIVISION OF THE HISTORY OF CHEMISTRY

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HIST

DIVISION OF THE HISTORY OF CHEMISTRY

Final Program, 242nd ACS National Meeting, Denver, CO, August 28 - Sept 1, 2011

S. C. Rasmussen, *Program Chair*

BUSINESS MEETING:
HIST Executive Committee Meeting, 5:00 pm: Sun

SUNDAY MORNING

Colorado Convention Center – Four Seasons BR 4

Empowering Tomorrow's Science Super Heroes (PRES)

Cosponsored by ANYL, BMGT, CHED, CINF, COMSCI, FUEL, GEOC, HIST, I&EC, INOR, MEDI, PHYS, PROF, and YCC

SUNDAY AFTERNOON

Sheraton Denver – Terrace

Gibbs Medal Centennial

K. Fivizzani, *Organizer, Presiding*

Cosponsored by COLL, COMSCI, I&EC, INOR, ORGN, PETR, and PHYS
Financially supported by Chicago Local ACS Section

1:00 — Introductory Remarks.
1:05 — 1. History of the Gibbs Medal and selection process. **K. P. Fivizzani**
1:30 — 2. Josiah Willard Gibbs – Genius of science and mathematics. **K. S. Kostecka**
1:55 — 3. Fuel from sunlight and water. **H. Gray**
2:25 — Intermission.
2:40 — 4. DNA-mediated signaling. **J. K. Barton**
3:10 — 5. Irreproducibility in the scientific literature: How often do scientists tell the whole truth and nothing but the truth? **R. G. Bergman**
3:40 — 6. Three-cornered hat. **J. M. Thomas**
4:10 — 7. My life with LIF. **R. N. Zare**

Colorado Convention Center – Four Seasons BR 4

Science on the Hollywood Screen (PRES)

Cosponsored by ANYL, BMGT, CHED, CINF, COMSCI, FUEL, GEOC, HIST, I&EC, INOR, MEDI, PHYS, PROF, and YCC

MONDAY MORNING

Sheraton Denver – Terrace

General Papers

S. C. Rasmussen, *Organizer, Presiding*

7:45 — 8. HIST tutorial: Gases of the atmosphere. **C. J. Giunta**
8:25 — 9. Fifty years of Vaska's compound. **R. U. Kirss**
8:55 — 10. 80 Years of terpyridine chemistry. **A. Winter**, G. R. Newkome, U. S. Schubert
9:25 — 11. Extroverted confusion – Linus Pauling, Melvin Calvin and porphyrin isomers. **M. O. Senge**
9:55 — Intermission.
10:10 — 12. John William Baker and the development of the Baker-Nathan effect. **M. D. Saltzman**
10:40 — 13. Arnaldo Piutti and the discovery of enantioselectivity in receptor-mediated biological activity. **J. Gal**
11:10 — 14. Early 20th century opinion on engineering training for chemistry undergraduates. **R. A. Egolf**, P. A. Khoury
11:40 — 15. Inner meanings of physical chemistry: Understanding the atom and nuclear reactions. **A. Galadari**

MONDAY AFTERNOON

Sheraton Denver – Terrace

Gibbs Medal Centennial

K. Fivizzani, *Organizer, Presiding*

Cosponsored by COLL, COMSCI, I&EC, INOR, ORGN, PETR, and PHYS
Financially supported by Chicago Local ACS Section

1:30 — 16. Developments in field of electron and related transfers - now and then. **R. A. Marcus**
2:00 — 17. Reactions at surfaces: Delving below and beyond. **S. T. Ceyer**
2:30 — 18. Gibbs Medal Award. Galloping cyclohexane conformations. **J. D. Roberts**
3:00 — Intermission.
3:15 — 19. Molecular recognition of DNA by small molecules, a historical perspective. **P. B. Dervan**
3:45 — 20. Ionic reactions and solvation. **J. I. Brauman**
4:15 — 21. Structure property relationships in molecular wires. **R. Breslow**

Sheraton Denver – Beverly

Gibbs Medal Centennial Reception

4:45 - 6:30

MONDAY EVENING

Colorado Convention Center – Hall D

Sci-Mix

S. C. Rasmussen, *Organizer*

8:00 - 10:00
8, 9, 14. See previous listings.
33. See subsequent listings.

TUESDAY MORNING

Sheraton Denver – Terrace

IYC'11: A Philatelic Celebration

R. Hill, *Organizer*
D. Rabinovich, *Organizer, Presiding*

Cosponsored by CHED

8:30 — Introductory Remarks.
8:35 — 22. Chemical philately: Classroom applications. **M. A. Morgan**
9:05 — 23. The Joseph Priestley House; A philatelic remembrance. **J. B. Sharkey**
9:35 — 24. Gibbs, thermodynamics, visualization - all for just 37 cents! **K. R. Jolls**
10:05 — Intermission.
10:20 — 25. Chemical philately and the story of the quantum. **C. Lang**
10:50 — 26. Curie semipostal stamps of 1938. **R. Hill**, D. Rabinovich
11:20 — 27. Aluminum on stamps: A tribute on the 125th anniversary of the Hall-Héroult process. **D. Rabinovich**

TUESDAY AFTERNOON

Sheraton Denver – Terrace

Profiles of Past ACS Presidents

J. Francisco, *Organizer*
J. Hayes, *Organizer, Presiding*

Cosponsored by PRES

2:00 — Introductory Remarks.
2:05 — 28. Why does ACS need an accessible history of its presidents? **J. S. Francisco**
2:30 — 29. What does an ACS president do besides pontificate? **W. F. Carroll**
2:55 — 30. Who were the first ACS Presidents? **P. L. Perez**
3:15 — Intermission.
3:30 — 31. Anna J. Harrison: After 102 years, the first ACS woman president. **L. P. Eubanks**
3:55 — 32. Reflections on the ACS presidents at the end of the 20th century. **B. E. Bursten**
4:20 — 33. Do you want to know more about the ACS presidents? Select acs.org instead of Wikipedia? **J. M. Hayes**
4:45 — Reception.

HIST 1: History of the Gibbs Medal and selection process

Kenneth P Fivizzani[1]*, kfivizzani@wowway.com, 4251 Colton Circle, Naperville IL 60564, United States. (1) ACS Chicago Local Section, United States*

In May 2011, the 100th Willard Gibbs Medal was presented to a scientist "who because of eminent work in and original contributions to pure or applied chemistry, is deemed worthy of special recognition by the jury." The list of recipients is a who's who of chemistry. Each recipient is selected by the Jury of the Willard Gibbs Medal, which consists of twelve members elected from the ACS. Bylaw XV of the Chicago Section Bylaws contains the rules for the Gibbs Medal selection process and the presentation of the medal. The selection process begins each year on July 1; the Chair-elect of the Chicago Section is the Chair of the Jury through the presentation of the award.

HIST 2: Josiah Willard Gibbs – Genius of science and mathematics

Keith S Kostecka[1]*, kkostecka@colum.edu, 600 S. Michigan Avenue, Chicago Illinois 60605, United States. (1) Department of Science and Mathematics, Columbia College - Chicago, Chicago Illinois 60605, United States*

Josiah Willard Gibbs (1839-1903), best known for his work in chemical thermodynamics and physical chemistry, was also well known for his accomplishments in physics and mathematics. These achievements were throughout his life in: his early years; young adulthood and also his senior years. Gibb's formative years were centered on Hopkins Grammar School and Yale University where he graduated from in 1858 with honors in mathematics. His young adult years saw Gibbs complete his Ph.D. in engineering, tutor at Yale and then go to Europe to study chemistry and thermodynamics. From 1873 to 1878 Gibbs, back at Yale as a professor of mathematical physics, published a series of papers where he applied thermodynamics to interpret physicochemical phenomena. Gibb's senior years saw him develop vector analysis and further the development of statistical mechanics. He also won the Copley Medal in 1901; in the years following his death there would be many honors.

HIST 3: Fuel from sunlight and water

Harry Gray[1]*, hbgray@caltech.edu, 1200 E Calif Blvd, Pasadena California 91125, United States . (1) Department of Chemistry, California Institute of Technology, Pasadena California 91125, United States*

We are working on rugged light absorbers and catalysts made from Earth abundant materials that have the potential to split water as efficiently as natural photosynthesis. We have recruited hundreds of students to join a Solar Army whose mission is the discovery of brand new metal-oxide catalysts for solar water splitters.

HIST 4: DNA-mediated signaling

Jacqueline K. Barton[1]*, jkbarton@caltech.edu, 1200 E. California Blvd., Pasadena CA 91125, United States . (1) Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena CA 91125, United States*

DNA charge transport chemistry provides an opportunity to carry out redox chemistry at a distance. Many experiments have now shown that DNA-mediated charge transport can arise over long molecular distances but in a reaction that is exquisitely sensitive to perturbations in the DNA base stack. Studies are described to characterize biological roles for DNA charge transport. This chemistry may be used advantageously within the cell in long range signaling to DNA-bound proteins, both to regulate transcription and to activate DNA repair under conditions of oxidative stress.

HIST 5: Irreproducibility in the scientific literature: How often do scientists tell the whole truth and nothing but the truth?

Robert G Bergman[1]*, rbergman@berkeley.edu, Latimer Hall #1460, Berkeley CA 94720-1460, United States . (1) Department of Chemistry and Chemical Sciences Division, University of California, Berkeley and Lawrence Berkeley National Laboratory, Berkeley, Berkeley CA 94720-1460, United States*

This lecture will address reports of scientific misconduct that have appeared in recent years, as well as other issues of scientific ethics, from the point of view of an active worker in synthetic organic and inorganic chemistry. After a discussion of primary scientific fraud, such as plagiarism and data fabrication, the general question of scientific data reproducibility will be considered. The talk will assess the level of reproducibility of most research in the synthetic chemical literature, and then focus on two journals, Organic Synthetic and Inorganic Synthesis, which are among the only organs that provide a source of direct information about irreproducibility. The talk will consider the question of whether trying to insure reproducibility necessarily acts as an effective means of protecting science from fraud, and will close by consideration of other ethical issues: “semi-fraud”, the conscious and unconscious manipulation of data, how experimenters manipulate data (and how it manipulates experimenters), ethical problems in peer review, and ethics in interpersonal scientific behavior.

HIST 6: Three-cornered hat

John Meurig Thomas[1]*, jmt2@cam.ac.uk, CB2 3QZ, Cambridge Cambridge, United Kingdom . (1) Department of Materials Science, University of Cambridge, Cambridge CB2 3QZ, United Kingdom*

A whirlwind account is to be given of: the popularization of chemical science, seen vicariously through the eyes of Davy and Faraday; the essence and applicability of single-site heterogeneous catalysts (SSHC); and revolutionary advances in chemical electron microscopy. The thoughts, actions and styles of Humphry Davy and Michael Faraday, two contrasting geniuses, speak to us down through the ages. SSHCs offer a strategy for the design of powerful new catalysts well suited to manufacture commodity-scale and fine chemicals in an environmentally responsible manner. The modern high-resolution electron microscope is arguably one of the single most powerful instruments that the chemist has at his or her disposal.

HIST 7: My life with LIF

Richard N. Zare[1]*, zare@stanford.edu, Department of Chemistry, Standford CA 94305-5080, United States . (1) Stanford University, United States*

Laser-induced fluorescence (LIF) offers many advantages. It gives a bright signal against a dark background enabling detection limits to be pushed to that of a single molecule. LIF permits preparation of a well-defined excited states whose properties — radiative and collisional — can be studied in great detail. It allows probing of molecules in extremely hostile environments, such as flames, arcs, and sparks. LIF can also be used in other amazing ways, from sorting cells, one at a time, to sequencing the human genome. I will present a personal account of my own work with LIF, beginning with the birth of the laser.

HIST 8: HIST tutorial: Gases of the atmosphere

Carmen J Giunta[1]*, giunta@lemoyne.edu, 1419 Salt Springs Rd., Syracuse NY 13214-1399, United States. (1) Department of Chemistry and Physics, Le Moyne College, Syracuse NY 13214-1399, United States*

Once upon a time, air was considered an element by those astute enough even to realize that it was matter. In the 18th century, it became apparent that air was actually a mixture of distinct "airs" (or gases to use the modern term). This presentation will focus on how the major components of the atmosphere came to be characterized and recognized as separate substances. It will include all of the most abundant components of

dry air and a few trace gases as well. Attention will be focused on, but not limited to, the pneumatic chemists of the 18th century.

HIST 9: Fifty years of Vaska's compound

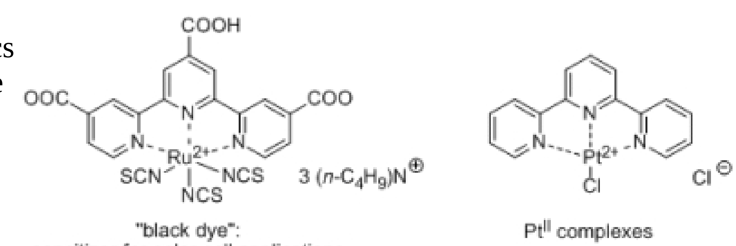
Rein U Kirss[(1)]*, r.kirss@neu.edu, 360 Huntington Avenue, Boston MA 02115, United States. (1) Department of Chemistry and Chemical Biology, Northeastern University, Boston MA 02115, United States*

Textbooks in organometallic chemistry list bis(triphenylphosphine)carbonyl iridium (I) chloride alongside the name “Vaska's compound”. This year (2011) represents fifty years since the synthesis and characterization of $Ir(PPh_3)_2(CO)Cl$ by Prof. Lauri Vaska. Who is Lauri Vaska and what path led him to discover the compound which bears his name? In this paper we will explore the road to $Ir(PPh_3)_2(CO)Cl$, how the complex came to bear Lauri Vaska's name, and the significance of the complex in organometallic chemistry. Lauri Vaska's work on group 8 and 9 transition metal compounds led to the discovery of a number of low valent complexes during the early days of a rapidly emerging field of organometallic chemistry. Vaska reported hydrogenation of olefins in 1965, the same year as Wilkinson reported on $ClRh(PPh_3)_3$. Vaska's compound adds many small molecules and activates aldehydes in an early example of metal catalyzed decarbonylation of aldehydes used in organic synthesis today.

HIST 10: 80 Years of terpyridine chemistry

Andreas Winter[(1)(2)]*, andreas.winter@uni-jena.de, Humboldtstr. 10, Jena Thuringia 07743, Germany; George R. Newkome*[(3)]*; Ulrich S. Schubert*[(1)(2)(4)]*. (1) Laboratory of Organic and Macromolecular Chemistry (IOMC), Friedrich-Schiller-University Jena, Jena 07743, Germany (2) Jena Center for Soft Matter (JCSM), Jena 07743, Germany (3) Departments of Polymer Science and the Maurice Morton Institute of Polymer Science, The University of Akron, Akron Ohio 44325-4717, United States (4) Dutch Polymer Institute, Jena 07743, Germany*

In 1931, Morgan and Burstall obtained 2,2':6',2"-terpyridine (tpy), along with other *N*-containing products, from a reaction of pyridine with anhydrous $FeCl_3$ in an autoclave (340 °C, 50 atm, 36 h). The instantaneous coordination of Fe^{II} ions gave rise to the first indication of metal complex formation. Within the last eight decades, tpy and its derivatives evolved from a rather chemical oddity to highly versatile ligands in modern supramolecular chemistry and outstanding applications of terpyridines and their meal complexes have been derived. In this respect, the “black dye” and Pt^{II} complexes as powerful sensitizer in photovoltaics and potent metallo-drug, respectively, have to be named. In this contribution, the historic benchmarks as well as today's applications of terpyridines in the fields of polymer science, nanotechnology, photo-physics, medicine and catalysis will be highlighted.



"black dye": sensitizer for solar cell applications

Pt^{II} complexes as metallo-drugs

HIST 11: Extroverted confusion – Linus Pauling, Melvin Calvin and porphyrin isomers

Mathias O. Senge[(1)]*, sengem@tcd.ie, SFI Tetrapyrrole Laboratory, Dublin - 2, Ireland. (1) School of Chemistry, Trinity College Dublin, Dublin 2, Ireland*

Isomeric porphyrins such as porphycenes and N-confused porphyrins have become a mainstay of contemporary supramolecular and coordination chemistry. Notably, the N-confused (2-aza-21-carbaporphyrins) were discovered in 1994 by Furuta *et al.* and Latos-Gra*żyńs*ki and coworkers and opened a whole new area of heteroatom substituted tetra- and oligopyrrole research. Historically, Melvin Calvin proposed "carboporphyrins" in 1943 and, unbeknownst to contemporary science, Linus Pauling analyzed the existence and stability of such fundamental porphyrin isomers in 1944. What he called "isoporphyrins" with "extroverted pyrrole rings" are clearly the isomeric 2-aza-21-carbaporphyrins of today.

HIST 12: **John William Baker and the development of the Baker-Nathan effect**

Martin D. Saltzman[(1)]*, MSALTZMN@providence.edu, 1 Cunningham Square, Providence RI 02918, United States. (1) Providence College, United States*

In 1935 John William Baker(1898-1967) and Wilfred Samuel Nathan(1911-1961) of Leeds University proposed a novel explanation for anomalous results that they had obtained in their studies of the rates of reaction in certain alkyl-substituted compounds. This involved the assumption that the electrons in a carbon-hydrogen bond adjacent to an unsaturated carbon were able to be delocalized. This explanation was applied to many other situations and soon the Baker-Nathan effect was applied to many other anomalous results by Baker and other investigators. This paper will initially discuss the life and chemical work of John William Baker and in the second part will review the experimental work that led to the development of the Baker-Nathan effect . Finally the reasons why the Baker-Nathan effect as originally proposed is no longer in favor.

HIST 13: **Arnaldo Piutti and the discovery of enantioselectivity in receptor-mediated biological activity**

Joseph Gal[(1)]*, joe.gal@ucdenver.edu, University of Colorado Hospital, Clinical Laboratory A 022, Aurora Colorado 80045, United States. (1) University of Colorado School of Medicine, United States*

The first example of biological enantioselectivity, a difference in the microbial metabolism of the tartaric acid enantiomers, was discovered by Louis Pasteur in 1857. Nearly 30 years later, in 1886, Arnaldo Piutti (1857-1928), an Italian chemist, discovered the first example of enantioselectivity in what is considered today a receptor-mediated biological activity. Natural (*L*) asparagine had first been isolated in the early 1800s but D-asparagine was unknown. Piutti separated D-asparagine from the L-enantiomer obtained from germinated vetch. From 650 kg of vetch he obtained 20 kg of L-asparagine and 100 g of the pure D enantiomer. The two enantiomers crystallized in enantiomorphous forms and had equal but opposite optical rotations. Most importantly, Piutti found that L-asparagine was without taste but the D-enantiomer was intensely sweet. This was the first reported observation of enantioselectivity in what is now known to be a receptor-mediated biological action, an important and widely occurring phenomenon.

HIST 14: **Early 20th century opinion on engineering training for chemistry undergraduates**

Roger A. Egolf[(1)]*, rae4@psu.edu, 2809 Saucon Valley Road, Center Valley PA 18034, United States; Peter A. Khoury*[(1)]*. (1) Pennsylvania State University-Lehigh Valley Campus, United States*

This paper will explore the variety of opinions held by early 20th century leaders in academic chemistry and chemical industry on the relative value of engineering education compared to traditional chemical education for students planning careers in chemical manufacturing and research.

HIST 15: **Inner meanings of physical chemistry: Understanding the atom and nuclear reactions**

Abdulla Galadari[(1)]*, aigaladari@gmail.com, P.O. Box 121051, Dubai Dubai, United Arab Emirates. (1) Department of Civil Engineering, Higher Colleges of Technology, Dubai, United Arab Emirates*

The study looks into deep meanings of the atom and nuclear reactions. The atomic age is relatively modern, but arguably the philosophy of the atom existed through human history. Examples include how kings' palaces resembled the nucleus of the atom, where the eunuchs used to serve the king's household, while the remainder of society were not allowed to cross through the walls of the palace. The king's household is likened to the protons in the nucleus and the eunuchs are likened with the neutrons inside the nucleus. Parallels are made from historic kings' palaces and the atom and how the interactions in the past resemble interactions within the atom. The paper also delves into the inner meanings of the periodic table of elements and its historic significance, as well as the inner meanings of nuclear reactions. This paper unlocks some spiritual aspects of alchemy that existed in the ancient times.

HIST 16: Developments in field of electron and related transfers - now and then

Rudolph A. Marcus[(1)]*, ram@caltech.edu, 1200 E. California Blvd., M/C 127-72, Pasadena CA 91125, United States. (1) Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena CA 91125, United States*

The electron transfer field has developed in numerous directions in the past half century. The subfields range from biological electron transfer (ET) to solar energy conversion, from ET in enzymes to ET in semiconductors, from transfer between molecules or ions in liquids to between liquids and between liquids and electrodes. They include ET's that are photoinduced and those that, instead, are light emitters. Studies now range from ET in ensembles to ET in the complementary field of single molecules. Some of the concepts developed originally for electron transfers, such as the dependence of reaction rate constant on standard free energy of reaction, and the cross-relation, have been extended to atom and group transfers, though with a very different model for the potential energy surface. The usual pair of parabolas for ET was replaced by a more usual description of atom transfers. The model still gave the cross-relation for the rate constants (it works well) but not the inverted effect, a difference understood from the difference in topography of the potential energy curves for the ET and for the atom or group transfer. The developments of very fast ET introduced a new element and focused attention on solvent dynamics and the long neglected Kramers theory. In this lecture we summarize and discuss some of this history and current directions, including those related to solar energy conversion and to intermittent fluorescence of nanoparticles.

HIST 17: Reactions at surfaces: Delving below and beyond

Sylvia T. Ceyer[(1)]*, stceyer@mit.edu, 77 Mass Ave, 6-217, Cambridge MA 02139, United States. (1) Department of Chemistry, Massachusetts Institute of Technology, Cambridge MA 02139, United States*

Catalytic surface reactions depend not only on adsorbed species but also on absorbed species. Specifically, a H atom embedded in Ni bulk emerges onto the surface and in so doing, hydrogenates adsorbed ethylene and acetylene while absorbed H does not. Their distinct reactivities arise from different energetics. These results demonstrate that absorbed H is a reactant with a chemistry of its own. In a second system, Si dangling bonds abstract a F atom from XeF2 forming an adsorbed F and scattered XeF. Some XeF dissociates as a result of exothermicity partitioning to the XeF rovibrational continuum. The F and Xe are shown to arise from gas phase dissociation by demonstrating that angle-resolved velocity distributions of F, Xe, and XeF conserve momentum, energy, and mass. Knowledge and inclusion of abstraction and gas phase dissociation of a surface reaction product are critical to development of accurate models for etching and vapor deposition.

HIST 18: Gibbs Medal Award. Galloping cyclohexane conformations

John D. Roberts[(1)]*, robertsj@caltech.edu, Crellin Laboratory 184-39, Pasadena CA 91125, United States. (1) Division of Chemistry and Chemical Engineering, California Institution of Technology, Pasadena California 91125, United States*

The Willard Gibbs Medal is a very prestigious award for chemistry, with its 100-year life span, not much less than the 110-year life span of the Nobel Prize in Chemistry, indeed it is rather simiiar in scope, only

lacking a $1,000,000 honorarium. It differs from the Nobel tradition in awarding the honor mostly to US researcher, only 6 out of 100 from other countries. Being much older than the average of male American chemists, I was fortunate to be acquainted with 72 of the past awardees and it is a great group. A bit slow in recognizing women, but there were three in the last five years and before, only Marie Curie (1921). The subject of this talk will be the use of NMR to follow conformational and preferences changes in 1,2-trans- and 1,3-cis-cyclohexanedicarboxylic acids.

HIST 19: Molecular recognition of DNA by small molecules, a historical perspective

Peter B. Dervan[(1)]*, dervan@caltech.edu, Mail Code 164-30, Pasadena CA 91125, United States. (1) Division of Chemistry & Chemical Engineering, California Institute of Technology, United States*

Small molecules that bind specific DNA sequences would be useful tools in biology, biotechnology and potentially in human medicine. The field has its origins in the 1950's in natural products isolation and the search for antimicrobial and antitumor agents. I will attempt to trace this historical development from early concepts such as Lerman's “intercalation model” (1961) to the “Py-Im pairing rules” (1998) for minor groove recognition of the DNA double helix.

HIST 20: Ionic reactions and solvation

John I Brauman[(1)]*, brauman@stanford.edu, Department of Chemistry, Stanford University, Stanford CA 94305-5080, United States. (1) Department of Chemistry, Stanford University, Stanford CA 94305-5080, United States*

We usually observe ions in condensed phase, where the energies of solvation are very large. These large solvation effects often overwhelm the intrinsic “chemical” differences that might otherwise determine the chemistry of these ions. By studying the isolated ions in the gas phase we learn something about their intrinsic chemistry as well as the effects of solvation. Thermodynamics (acidity and basicity), kinetics (reaction dynamics) and mechanisms (S_N2, carbonyl addition) are all dramatically affected by solvation. I will discuss some of the experiments and conclusions that can be drawn from these studies.

HIST 21: Structure property relationships in molecular wires

Ronald Breslow[(1)]*, rb33@columbia.edu, 3000 Broadway, New York NY 10024, United States . (1) Department of Chemistry, Columbia University, New York New York 10027, United States*

The electrical conductivities of molecular wires, measured using a gold break junction, have been studied using various contacts. Extremely high conductivities were seen with gold atom contacts that directly incorporate into the gold electrodes. In other studies, conduction through stacked benzenes and through molecules with differing amounts of aromaticity and antiaromaticity are also of theoretical and practical interest.

HIST 22: Chemical philately: Classroom applications

Michael A. Morgan[(1)]*, mmorgan@lausd.net, 1200 North Cornwell Street, Los Angeles CA 90033, United States . (1) Francisco Bravo Medical Magnet High School, United States*

The History of Chemistry, its predecessor Alchemy, and the people involved in it are often portrayed on postage stamps. Stamps showing chemical formulae, structure, and laboratory glassware are especially enjoyable topics for postage stamps. In addition scientific units and constants have been honored on philatelic issues. The metric system and mathematical equations related to chemistry can be found on many issues. Stamps of the world relating to chemistry and its history will be discussed.

HIST 23: The Joseph Priestley House; A philatelic remembrance

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The temporary closing of the Priestley House in 2010 is a reminder of the fragile nature of many of our historic landmarks. Even though Joseph Priestley lived in Northumberland, PA for only ten years, the Joseph Priestley House remains today a site of major scientific importance. As part of this philatelic symposium celebrating the IYC, this paper will review some of the scientific meetings that have taken place at Priestley House over the past two centuries, and the philatelic evidence of these meetings. I will also briefly discuss some of Priestley's postal correspondence from Northumberland. Although the state staff was furloughed at the Priestley House, the site still operates through the generosity of The Friends of the Priestley House.

HIST 24: Gibbs, thermodynamics, visualization - all for just 37 cents!

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J. Willard Gibbs was too early to win a Nobel Prize. He didn't become a household name like Einstein, Pauling, or Watson and Crick. He didn't develop a popular audience as did Carl Sagan. And people didn't smile at him the way they did with Richard Feynman. But Josiah Willard Gibbs prescribed the analytical methods that have placed some of nature's most formidable powers into the hands of those who would try to wield them. "Strange, abstract, deep, difficult, impenetrable" -- all words that have been applied to the tools of Gibbsian thermodynamics. But not so! The careful observer will find in them not only scientific but artistic beauty and explanations that satisfy both sides of the brain. And now also the front side of an envelope.

HIST 25: Chemical philately and the story of the quantum

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When someone asks you "*What's new?*" have you ever considered responding … "*c over lambda!*" To the chemist and physicist, such a play on words suggests an understanding of the concepts of quantum theory. An equal response to "*What's nu?*" might be "*E over h*." These and many other theoretical principles are expressed on postage stamps and philatelic materials issued by .many nations of the world. This presentation will attempt to weave a thread between individuals and their respective contributions to Quantum Theory.

HIST 26: Curie semipostal stamps of 1938

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Marie and Pierre Curie were commemorated on a special omnibus issue of semi-postal stamps issued around the world in the fall of 1938. France and 21 of its colonies issued special stamps with an added surcharge to raise funds for the l'Union Internationale Contre le Cancer (l'UICC), which raised funds for the study, treatment and (ideally) the cure of cancer. Stamps of Monaco, Cuba and Afghanistan related to this effort will also be illustrated in this presentation, as is a detailed description of the design of these stamps.

HIST 27: **Aluminum on stamps: A tribute on the 125th anniversary of the Hall-Héroult process**

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The industrial production of aluminum by the high-temperature electrolysis of alumina (Al2O3) dissolved in molten cryolite (Na_3AlF_6) was developed independently and almost simultaneously in 1886 by Charles Martin Hall in the United States and Paul Héroult in France. This presentation will literally describe the world of aluminum from cradle to grave, from the mining and purification of bauxite throughout the world to the recycling of discarded aluminum products, as illustrated on postage stamps and other philatelic materials (maximum cards, first day covers, special cancellations, etc.). The unique combination of physical properties that this ubiquitous metal exhibits (low density, high electrical conductivity, malleability, resistance to corrosion) and its impact on society, including the construction, transportation, and food industries, will also be highlighted in this presentation.

HIST 28: **Why does ACS need an accessible history of its presidents?**

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How did the Past Presidents Project (P3) originate? What is contained in the P3? How did the idea of this project develop to include an accessible history of the ACS presidents? What information will be on each president's web page now and in the future? Why does the project look for patterns in the backgrounds, experiences, and achievements of the presidents? Is it not intriguing that the history will never be completed, that every ACS member is a potential contributor?

HIST 29: **What does an ACS president do besides pontificate?**

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Why does a person run for the office of ACS president, and become a part of a three-year journey as president-elect, president and immediate past president? In addition to serving as a national and international representative of the chemical sciences to other chemists, a member of the ACS presidential succession interacts with students at all levels, the general public, government bodies, and the media. They carry out many activities in order to achieve their presidential goal(s), whatever they might be. Further, the president presides at two national meetings, visits several regional meetings and a score of other Board meetings and activities. In order to manage all these tasks, they must possess excellent communication skills, strong powers of persuasion, lots of energy and the support of staff, colleagues, bosses and family.

HIST 30: **Who were the first ACS Presidents?**

Patricia L Perez[(1)]*, PatTheChemProf@yahoo.com, 776 Teakwood Lane, San Dimas CA 91773, United States . (1) Project Inclusion, San Dimas CA 91773, United States*

In this presentation I will explore the beginnings of our organization, the American Chemical Society. This historical overview will focus on the experiences, careers and years of service of the first five (5) ACS presidents. The presidents were John W. Draper (1876), J. Lawrence Smith (1877), Samuel W. Johnson (1878), T. Sherry Hunt (1879), and Frederick A. Genth (1880). Each of these individual chemists brought his own background and vision that laid the foundation for the current American Chemical Society.

HIST 31: Anna J. Harrison - After 102 years, the first ACS woman president

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In 1978, Anna Jane Harrison became the first woman to be elected ACS President. This major leadership role was an appropriate recognition of her career as a pioneer educator and researcher and honored the traditions of excellence set by her predecessors. Her impact upon me, her former student, was significant, expanding my networks and enriching my understanding of the relationships among science and society. Her vision and leadership in guiding the policies of the ACS and other scientific organizations was profound, improving interactions with regulatory agencies, developing programs for non-science majors as well as majors, and expanding our understanding of what it means to be a professional chemist. Anna Harrison received the ACS Award in Chemical Education in 1982, and her humility and vision of leadership were captured in this quotation from her award address: “The fundamental reason for joining any professional society is that we achieve collectively that which none of us can achieve individually.”

HIST 32: Reflections on the ACS presidents at the end of the 20th century

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From my point of view as the 2008 ACS president, I would like to reflect on the impact of the presidents of the American Chemical Society in the 1980s and 1990s. What were their major accomplishments and successes? How did their actions and decisions affect the direction of ACS policies and activities over this particular period of time? How did they influence the interactions of the ACS with other scientific societies, in the United States and abroad? And how did these actions become the foundation for my term of service?

HIST 33: Do you want to know more about the ACS presidents? Select acs.org instead of Wikipedia?

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This P3 project started because one had to go to Wikipedia to get a complete list of the ACS presidents. One result of the project is a collection of the vast amount of information on our past presidents. We will report some interesting trends and statistics gleaned from that information. One of the major products of this project is a new page on acs.org. This page, ACS Past Presidents, will be introduced at this symposium. Not only will there be a complete list of the presidents but also a link to a page for each with a picture and basic information. Behind that page will be a growing series of pages with more detailed information and links for each president. This will be a dynamic source for the future use of ACS members, educators, students and the general public.