

THE NUCLEUS

April 1995

Of the Northeastern Section of the American Chemical Society

Vol. LXXIII, No. 8

Monthly Meeting

*Esselen Award to
Howard J. Schaeffer*

MCG Symposium

*Radiopharmaceuticals and
Imaging Agents*

Historical Notes

A scientific puzzle

ACS News

Risk assessment initiatives



Call for Papers

The Thirty-fourth Annual Undergraduate Research Symposium of the Northeastern Section of the American Chemical Society on Saturday, April 29, 1995 at Boston University

Metcalf Center for Science and Engineering
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(hosted by the Department of Chemistry and Chemia, the ACS Student Affiliates Chapter)
Send abstracts on standard ACS forms to the organizer:

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Boston University
Boston, MA 02215
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e-mail: psamuel@chem.bu.edu

**Deadline for receipt of abstracts:
April 14, 1995.**

Undergraduate Research Poster Session at the 210th National Meeting of the American Chemical Society Chicago, Illinois August 20-24, 1995

The ACS invites undergraduate students to submit abstracts of their research papers for presentation at the Undergraduate Research Poster Session, which will be part of the extensive programming for undergraduates at this national meeting. Send abstracts on standard ACS forms to:

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Established in 1993, the Passer Fund is intended to support teacher participation in continuing education courses for teachers who are somewhat isolated from others in the discipline. It is expected that requesters will provide some of the support needed for their proposals through personal or other resources. Sabbatical leaves cannot be supported at this time.

Proposals should be sent to Adrienne Kozlowski, Chemistry Department, Central Connecticut State University, New Britain, CT 06050 and may be submitted any time, but should allow at least 6 months for consideration. Include a short description of the intended use of the award, a CV of the requester, and a brief description of the requester's institution. ♦

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Cover: Howard J. Schaeffer, the Esselen Award Recipient

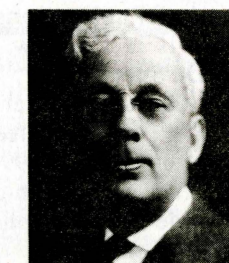
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THE NUCLEUS

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Editor: Arno Heyn, 21 Alexander Rd., Newton, MA 02161, Tel: 969-5712, FAX: 527-2032
Associate Editor: Myron S. Simon, 20 Somerset Rd., W. Newton, MA 02165, Tel: 332-5273
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Contributing Editors: Edward Atkinson, History of Chemistry, Book Reviews; Maryann Solstad, Health; Tari Varco-Shea, Calendar.
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From the Editor

Scientific certainty and error

This being the April issue it is appropriate to have something in a lighter vein.

While staying in bed late on a recent Saturday morn and listening to PBS I heard a story I had not seen in the recent press: Sweden has found that the sonar signals supposedly produced by Soviet submarines violating its waters in the Baltic were, in fact, signals picked up from minks swimming under water. It appears that swimming minks generate signals in their chest which sound very much like submarines.

Just by chance, the night before, I perused the letter section of *C&EN*, Feb. 13, 1995, 4-5, and saw the exchange of letters between Profs. Gordon Gribble (Dartmouth College) and Thomas G. Spiro and Valerie M. Thomas (Princeton University) about the natural occurrence of organochlorine compounds. G. Gribble expands on his earlier statements, such as his letter in the *NUCLEUS*, 72(6),6, 1994 and article, 72(9),15 (1994) stating that naturally generated organohalogen compounds constitute a large, if not major, portion of these compounds found in nature, which have been ascribed to man-made organohalogen compounds, while most chemists, the EPA and environmentalists assume that the environmental effects (i.e. stratospheric ozone loss) are due to man-made organohalogen compounds. This is a controversy as yet unresolved.

Then there was Dr. Kary Mullis' Esselen Award Address (*NUCLEUS*, 72(10) 4, 1994) in which he expressed opinions about the nature of the HIV virus which differ considerably from the generally held views.

The recent stories of wrong turns that some scientists have taken came to mind: Cold Fusion; the supposed effect maintained by impossibly dilute solutions that contain less than one molecule per liter of the supposedly effective substance – a few years ago by Benveniste, a French scientists in *NATURE* (334, 291, (1988) and much

earlier an analogous effect described by Heintz in *Die Naturwissenschaften* 29,(48), 713 (1941), which I summarized for the *NUCLEUS*, 65(7), 10; (8), 8 and 66(1), 12, all in 1987, and the story of "polywater."

Yet, one must not be too hasty to reject unconventional views: What would have happened if 50 years ago a doctoral candidate had proposed the preparation of noble gas halides for doctoral research? The doctoral committee probably would have rejected the proposal as clearly preposterous and not worthy of a serious Ph.D. candidate's time. After all, everybody knew that the noble gases had completed outer electronic shells and therefore couldn't form any compounds. Yet, Neil Bartlett prepared Xenon fluoride as a well defined compound which could be isolated, recrystallized and was of definite composition, not just a loose addition compound.

Then, recently, a 1994 book by Neil Steinberg: *Complete and Utter Failure* came to my attention, which describes "failure, from the mildly embarrassing to the markedly catastrophic", as the announcement states, and it mentions cold fusion as one of the topics covered. This reminded me of a personal experience: About 40 years ago I spent a summer in a national laboratory working on zirconium analysis and accidentally discovered that I obtained clear polarographic waves when I subjected solutions of zirconium to classical polarography. The solutions had a faint yellow color, which I ascribed to small amounts of dissolved NO₂ left from the dissolution of Zr metal by HNO₃ and HF, which I ignored. I ran calibration tests and got the desired linear relationship between concentration and diffusion current. Although zirconium is known to have only the +4 state in solution, reduction waves were obtained, the earmarks of a change in oxidation state. I wanted to obtain some more data and repeated the experiments back in my own lab and

discovered that those solutions prepared from zirconium which were colorless gave no polarographic waves, but those which were slightly yellow gave the effect. Since the solutions were prepared by treating the pure zirconium metal in a supposedly inert platinum crucible, it became apparent that the waves obtained were the well-known catalytic waves produced by Pt in acid solutions: trace amounts of platinum dissolved by this treatment give a nice calibration curve which, however, has nothing to do with zirconium!

So what does all this mean? Never take "well established" ideas for granted. Consider all possible alternative explanations. Never be too sure of yourself, especially if your results support your ideas: question your experimental approach, searching for alternate interpretations. So, don't fool yourself, even on April 1. ◇

Abstract

continued from page 5

for the treatment of herpes infections. It has been approved for use by the oral, intravenous, and topical routes of administration. Acyclovir must also be activated to its phosphate form to exert its antiviral effect, but it is activated by a specific enzyme coded by the herpes virus. Thus, activation of acyclovir occurs where it is needed, i.e. primarily in the infected cells. Details of the mechanism of antiviral action of the second generation agents will be presented. ◇

More ACS News

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to minimize the potential for chemical accidents."

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Calendar

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Prof. Yuri Korshak (Mendeleev University of Chemical Technology)
"Metathesis in Polymer Chemistry – Review and New"
Tufts University
Rm. 136, STC Bldg. at 2:30 pm

April 21

Lynnmarie Thompson (UMass Amherst)
"Solid State NMR of the Chemotaxis Receptor"
Wellesley College
Rm. 278, Science Center. at 3:30 pm

Prof. Didier Astruc (Université Bordeaux, France)
"Organoiron Strategies for the Synthesis of Molecular Trees"
Harvard University
12 Oxford St., Mb-23 at 4:00 pm

April 24

Prof. John Bercaw (CalTech)
"Ziegler-Natta Polymerization of Propylene: A Remarkable Asymmetric Catalytic Process"
Harvard University
12 Oxford St., Mb-23 at 4:15 pm

April 25

Prof. John Fourkas (Boston College)
"Making Movies of Chemical Reactions in Solids"
Tufts University
Pearson Chem. Bldg., Rm. 104 at 4:30 pm

April 26

Marcus Weldon (Friend Group, Harvard University)
"Vibrational Spectroscopy as a Probe of Adsorbate Structure, Bonding, and Reactivity"
Harvard University
12 Oxford St., Rm. Mb-23 at 4:00 pm

April 27

Prof. Peter Beak (University of Illinois, Urbana-Champaign)
"Endocyclic Reactions: From Mechanism of Substitution at Nonstereogenic Atoms to Asymmetric Syntheses"
Boston College
Rm. 127, Merkert Chem. Ctr. at 4:00 pm

Notices for the Nucleus Calendar should be sent to:

Tari Varco-Shea
Dept. of Chemistry, Wellesley College
Wellesley, MA 02181
Tel: (617) 283-3056; Fax: (617) 283-3642
e-mail: tvarcoshea@lucy.Wellesley.edu ◇

ACS News

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cost of regulatory compliance.

Public health effects and federal, state and local legislation and regulation will be the focus in the morning on day two. The conference will conclude in the afternoon with an open discussion among attendees and panelists."

The announcement invites reporters of recognized publications or broadcast sources to register for the meeting. The *NUCLEUS*, having no funds for such purposes, will not be attending, but I am sure we will hear more about the results during and after the meeting. Who knows, CSpan or PBS might find some time to turn its cameras on keynote speakers.

ACS Publication on Risk Issues

In January the Risk Education Project of the American Chemical Society announced the February 1995 publication of the first of a bimonthly newsletter *The Risk Advisory* designed primarily for Capitol Hill readers. The Risk Education Project will also sponsor a series of luncheon briefings for congressional staffers. "The goal of the project is to facilitate informed debate in Congress when risk legislation is crafted," according to the *ACS Washington Alert* newsletter of January 16, 1995. The project is an outgrowth of the ACS Capital Campaign commitment by the Eastman Kodak Company. ◇

Historical Notes

continued from page 4

Dr. Grmek replied that he also had never encountered mention of the Bernard experiment. He did believe, though, that the experiment was just the type that Bernard might have carried out. I am encouraged by this expression of plausibility.

I don't think that I shall be able to carry on my search for another 60 years without more help. Perhaps, among the savants of the Northeastern Section there are those who read this and will volunteer to supply any information they may have about the double guillotine of Claude Bernard. ◇

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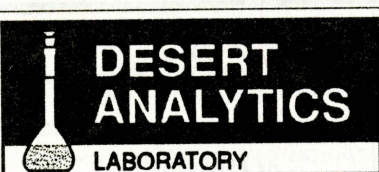
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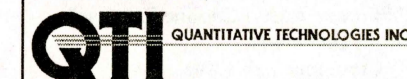
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April 3

Dr. Annabella Villalobos (Pfizer Pharmaceuticals)
“CP118954, A Potent & Selective Inhibitor of Acetyl Choline Esterase”
Boston University
509 Commonwealth Ave.
SCI 107 at 4:00 pm

Prof. Kyu-Yong Choi (Univ. of Maryland)
“Modeling and Control of Polymerization Reactors”
Tufts University
Rm. 136, STC Bldg. at 2:30 pm

April 6

Dr. Dale McMorro (Naval Research Laboratory)
“Intermolecular Structure and Dynamics in Liquids Probed with Femtosecond Fourier Transform Raman Spectroscopy”
Boston College
Rm. 127, Merkert Chemistry Ctr.
at 4:00 pm

April 7

Peter Lansbury (MIT)
“Mechanisms of Amyloid Deposition in Alzheimer’s Disease and Scrapie”
Wellesley College
Rm. 278, Science Center at 3:30 pm

April 10

Prof. Philip Anfinsen (Harvard Univ.)
“Femtosecond to Microsecond Dynamics in Proteins: New Mechanistic Insights into the Function of Myoglobin”
Boston University
590 Commonwealth Ave.
SCI 107 at 4:00 pm

Dr. Ralph D. Nelson (DuPont Company)
“Using Colloid Science to Solve Industrial Problems”
Tufts University
Rm. 136, STC Bldg. at 2:30 pm

Prof. A.J. Bard (University of Texas)
“Scanning Electrochemical Microscopy – A New Technique for Characterizing Surfaces and Reactions”
Northeastern University
Rm. 129, Hurtig Bldg. at 4:00 pm

April 11

Prof. A.J. Bard (University of Texas)
“Sensitive and Selective Analytical Methods Based on Electrogenerated Chemiluminescence”
Northeastern University
Rm. 129 Hurtig Bldg. at 4:00 pm

Prof. Julian Davies (University of Toledo)
“The Question of Artificial NH_3 Photosynthesis”
Tufts University
Pearson 104 at 4:30 pm

April 13

Prof. Graham Fleming (University of Chicago)
“Non-linear Spectroscopic Studies of Condensed Phase Dynamics”
Harvard University
12 Oxford St., Rm. Mb-23 at 5:00pm

Prof. S. Sridhard (Northeastern Univ.)
“Chaos and Disorder in Quantum Mechanics”
Northeastern University
Rm. 129, Hurtig Bldg. at 4:00 pm

Prof. Guilford Jones, II (Boston Univ.)
“Mechanistic Paradigms for Design of Photochemical Electron Transfer Systems in Polymer Systems”
UMass Lowell
Olney Hall, Rm. 428 at 3:30 pm

April 17

Dr. Richard Klausner (NIH)
“The Genetics and Biochemistry of Metal Metabolism”
Harvard University
12 Oxford St., Rm. Mb-23 at 4:15 pm

April 18

Prof. Peter Uden (Univ. of Mass.)
“Atomic Spectral Detection in Chromatography: Environmental, Geochemical and Petrochemical Applications”
Tufts University
Pearson Chem. Bldg. Rm. 104 at 4:30 pm

April 19

Dr. William A Eaton (Laboratory of Chemical Physics, NIH)
“Protein Folding”
Harvard University
12 Oxford St., Rm. Mb-23 at 4:00 pm

Prof. Harold Scheraga (Cornell Univ.)
“Solution of the Multiple-Minima Problem in Protein Folding”
Boston University
590 Commonwealth Ave.
SCI 107 at 4:00 pm

April 20

Dr. Ruth R. Kramer (Lilly Research Lab.)
“Structure, Function, and Regulation of Human Cytosolic Phospholipase A2”
Boston College
Rm. 127, Merkert Chem. Ctr. at 4:00 pm

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