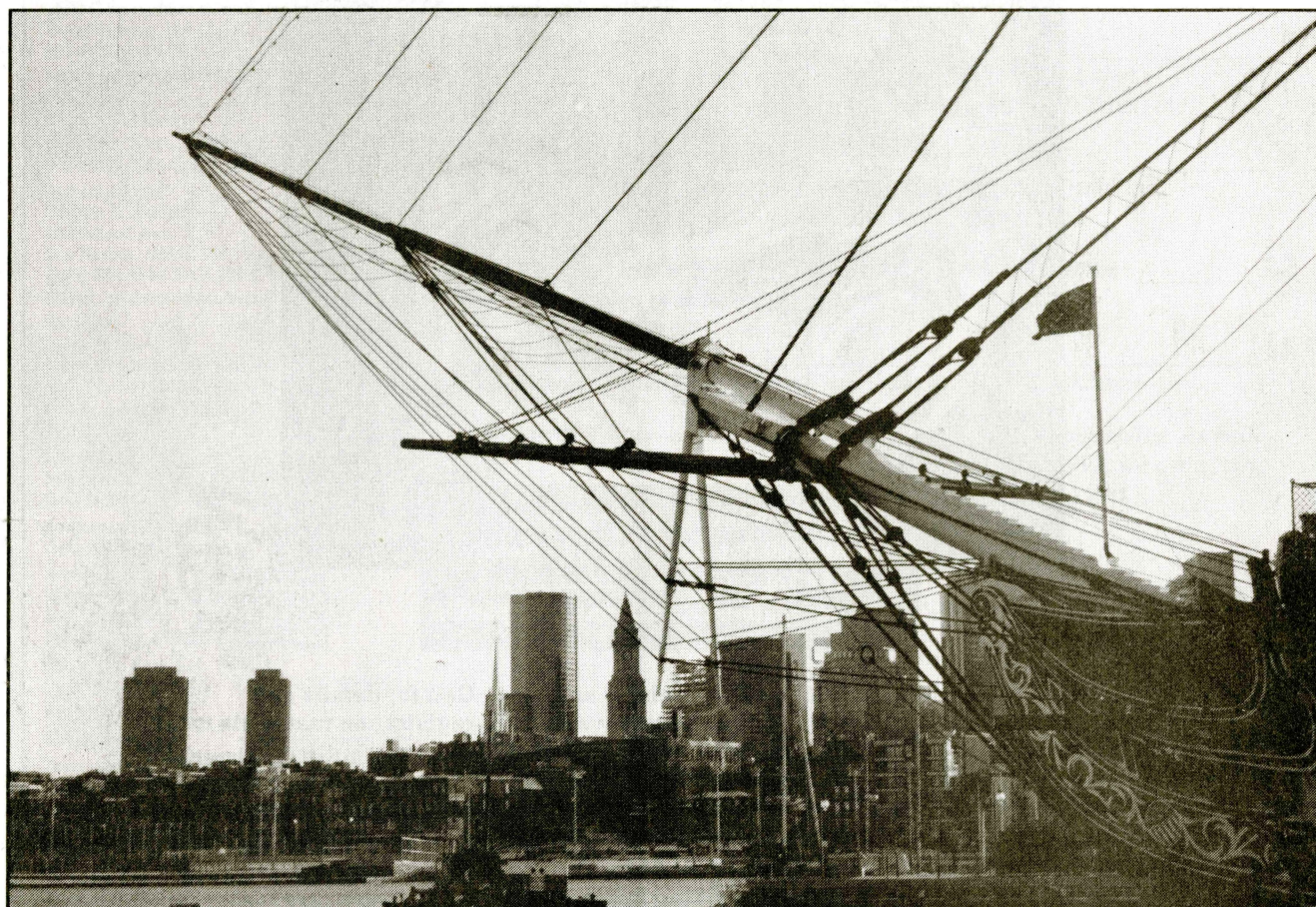


THE NUCLEUS

October 1997

Of the Northeastern Section of the American Chemical Society

Vol. LXXVI, No. 2



Monthly Meeting

Dr. Joan E. Shields on Women in Chemistry

Book Review

Understanding Medications by Alfred Burger

Henry A. Hill Awards

About Henry A. Hill and the three 1997 Awardees

Ion Selective Electrodes

Report of the talk at the September 18 meeting

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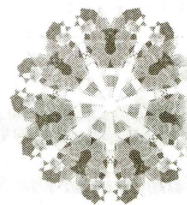
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Cover: *The bow of Old Ironsides in front of the Boston skyline. As USS Constitution celebrates it's bicentennial in 1997, we are getting ready to celebrate the Section's centennial in 1998. (photo by M.S. Simon)*

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THE NUCLEUS

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Henry Aaron Hill

This month we are honoring the memory of Henry A. Hill by giving awards in his name to three of our section members for meritorious service to the Northeastern Section.

Who was Henry A. Hill? Henry Hill was Chairman of our Section in 1963. He was very active in the national ACS, and after being a member of, and chairman of several of its committees, especially notably his service on the Professional Relations Committee, where he drafted the *Professional Employment Guidelines*. He was Director of the ACS in 1971-1975 and was elected President-Elect and became President in 1976.

Born in St. Joseph, Missouri he obtained a bachelor's degree from Johnson C. Smith University, then a segregated university for "colored" students, as they were then called. Because of his excellent record he was accepted at M.I.T., to study organic chemistry, and obtained the Ph.D. in 1942 working under Prof. Robert C. Hockett. He had the highest grades of the graduate students in his class. While at M.I.T. he became acquainted with Prof. James Flack Norris of whom he said:

He was the first big man I met who was more interested in my ability

to learn chemistry than in the identity of my grandparents

Not being able to obtain a position in industry because of prevailing discrimination, he and a few colleagues established a small consulting business. In 1946 he joined Dewey & Almy Co as Research Supervisor and in 1952 he became Vice President of National Polychemicals which was active in polymer chemistry. He obtained patents for blowing agents.

In 1961 he established his own research and consulting business, "Riverside Laboratories" to be able to pursue his research interests and to allow him to participate in ACS activities.

After his untimely death in 1979, friends and colleagues in the Northeastern Section established the *Henry A. Hill Award for Outstanding Service to the Northeastern Section*. The first award was made posthumously to Henry A. Hill in 1980, his son Anthony C. Hill, then a reporter for WGBH, accepting the award. Since then, 17 members of this section have been thus honored and thereby honored the memory of Henry A. Hill.

From an appreciation of Henry A. Hill delivered by Arno Heyn at the 1991 Hill Award meeting and based on notes of the late Larry Powell. ◇

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right for exit to Rte. 30. Turn left, following Rte. 30 West. Proceed as above.

From Rte. 9 West

After crossing under Rte. 16, and after the traffic light at the fire station turn right just after the Gulf Station. Take Cliff Rd. northbound (left). The seventh road on the left is **Scotch Pine Rd.** Turn left into Scotch Pine Rd. and the first right (**Westcliff Rd.**). Henderson House is the first house on the left #99.

From Rte. 95/128 North or South Take exit 24 to Rte 30 West (if southbound on 128) or exit 20B to Rte. 9 Westbound (if northbound on 128) and follow directions for Rte. 30 West, or Rte. 9 West, respectively.

Park in front of Henderson house or in the large parking lot to its right. Respect the privacy of neighbors, do not park in front of homes. ◇

Directions

From Rte 30 Westbound

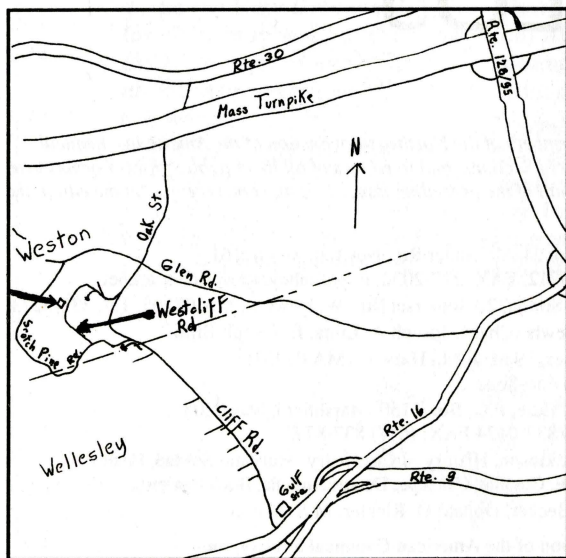
A little over a mile from Rte. 128, at the top of the hill, take a hairpin left onto Oak St. (sign: Oak St. to Cliff Rd.). Follow the road 0.7 mile to a 4-way intersection. Go straight through, take **second right onto Scotch Pine Rd.** Take first right (**Westcliff Rd.**) Henderson house is the first house on the left side (#99).

From Mass Turnpike West

Take exit 15 (Rte 95/128). After toll booth bear left, follow Rte. 30 West. Proceed as above

From Mass Turnpike East

Take exit 14 (Rte 95/128), follow sign for Rte. 128 North, then stay



Monthly Meeting

The 791th Meeting of the Northeastern Section of the American Chemical Society

Thursday, October 9, 1997

Henderson House, 99 Westcliff Rd., Weston, MA

5:30 Social Hour; a table of Career Services Literature and Aids will be available. See page 17

6:30 Dinner
50-year members honored

8:00 Evening Meeting, Dr. Martin Idelson, Chair, presiding
Henry A. Hill by Anthony C. Hill

Henry A. Hill Awards to:

Mary T. Burgess introduced by Dr. Martin Idelson

Michaeline F. Chen introduced by Dr. Janet Perkins

David M. Howell introduced by Dr. Edward Atkinson

Presentation of the awards by Dr. Michael Hearn

Address by Dr. Joan E. Shields, Long Island University; Chair,

Board of Directors of the American Chemical Society:

Women in Chemistry

Dinner reservations should be made no later than noon, October 2. Please call or fax Marilou Cashman at (800) 872-2054. Reservations not cancelled at least 24 hours in advance must be paid. Members, \$25.00; Non-members, \$28.00; Retirees, \$15.00; Students, \$ 8.00. **THE PUBLIC IS INVITED.**

Anyone who needs special services or transportation, please call Marilou Cashman a few days in advance so that suitable arrangements can be made.
Free Parking at Henderson House

Next Meeting: November 13, 1997 at M.I.T. Faculty Club, 50 Memorial Drive, Cambridge, Mass. James Flack Norris Award to Prof. A. Truman Schwartz. Reception 5:30, dinner 6:30, evening meeting 8:00PM.

Biography

Joan Shields is presently Chairman of the American Chemical Society's Board of Directors, having held that position since January 1996. She is also Chairman of the Executive Committee of the Board and the Planning Committee and a member of the Governing Board for Publishing. She previously chaired the ACS Committee on Budget and Finance for 5 years.

Joan received a Ph.D. from Boston College, followed by a post-doctoral fellowship at the Max Planck Institute in Mulheim, Germany. She joined the faculty at Long Island University in 1968 and was promoted to full professor in 1974. She chaired the Chemistry Department at L.I.U. for 10 years. ◇

Henry A. Hill Awardees

This year the Awards Committee has selected three very active members of the Section whose work has often gone unrecognized.

While looking through the backfile of pictures taken at past meetings, preprandials, etc., it was surprising that no pictures were to be found (except one each of Mary and Michaeline with their back to the camera): They were busy in the background, whether checking people in for the dinner, or whether rushing around to make dinner arrangements for some unexpected guests who showed up

without reservations, or whatever else needed doing. This is typical for all three of our 1997 Hill Award Recipients: They have diligently done the many tasks without which the Section would not have operated smoothly. Each of the three have been nominated repeatedly for this award and the Awards Committee was agreed that all three should be named 1997 Henry A. Hill Award Recipients.

Mary T. Burgess

Mary received a B.S. degree from Simmons College. She started her working career at MIT, working with Prof. N.A. Milas, and later with Prof. A.A. Morton. Next she worked for Dewey & Almy, then for American Cyanamid in Stamford, Conn., then she returned to Boston to work at the U.S. Food and Drug Administration Laboratory, and later for Polaroid Corp. until retirement. Following this she worked at the U.S. Army Watertown Materials and Technology Labs. in Watertown for 11 years until her recent retirement

Her NESACS activities have been numerous. She was active in getting the Henry A. Hill Award started. At various times she has been: Councillor (current position), Alternate Councillor, Chairman of the Hospitality Committee, (also for the 1978 and 1993 Northeast Regional Meetings and the 1990 national ACS Meetings). Member of the NESACS Professional Relations Committee, the Membership Committee, and several Summerthing events, and most recently on the Centennial Committee.

In the national ACS she has been on the Professional Relations Committee and the Women Chemists Committee. She is active on Alumnae activities for Simmons College and the RE-SEED program at Northeastern University for retired scientists and engineers to work with science teachers in middle schools in this area.

Michaeline F. Chen

Received a B.A. from Clarke College and an M.S. from Boston College. She worked at the U.S. Army Watertown

Continued on page 6

Henry A. Hill Awardees

continued from page 5

Laboratory, and is now at the U.S. Army Research Laboratory at Aberdeen Proving Grounds, MD (but still has her home base in Needham, MA where she spends her weekends). She has been a Councilor since 1988, is a member of the NESACS Professional Relations Committee, has been on the Nominating Committee, Summerthing (including chairing it) for many years, chaired the Hospitality Committee 1984-1987, and in 1988 chaired the Public Relations Committee.

In the national ACS she is a member of the International Activities Committee and has been a member of the Economic and Professional Affairs Committee, the Economic Status Committee, and the Public Relations Committee.

David M. Howell

David received a B.S. at the University of California and an M.S. and Ph.D. at the University of Michigan. He has been an Associate Professor of Chemistry at Northeastern University and is now emeritus.

He has been an Editor of the NUCLEUS, Treasurer of the Section, Councilor of the Section and served on the Nominating Committee. He currently chairs the Public Relations Committee and previously the Hospitality Committee for many years, and before that the High School Examination Committee, the Board of Publications, and the Budget Committee. He has been on the ACS Committee for the James Bryant Conant Award for Excellence in High School Chemistry Teaching and has been a Congressional Delegate for the Ninth Mass. Congressional District.

Our heartfelt congratulations to you three, Mary, Michaeline and David. ◇

Fifty-Year Members

The number this year is larger than usual because starting this year, those who are beginning their 50th year of membership are recognized. Heretofore, only those who completed 50 years of membership were so honored. Because of this change, both those who joined in 1947 and 1948 are included.

Onie H. Adams	1948
Jagdish C. Agarwal	1947
Clifford E. Balmer	1948
Peter Bernfeld	1948
Seymour J. Birstein	1947
Charles A. Blank	1947
Mary T. Burgess	1948
Anne Buzzell	1947
Donald A. Caldwell	1947
Dodd S. Carr	1947
J. Edwin Carter	1948
George P. Changelian	1947
Anthony F. Chiulli	1947
Elias J. Corey, Jr.	1948
Phoenix N. Dangel	1947
Betty Daskin	1947
William K. Detweiler	1948
Margaret G. Driver	1948
John L. Ennis	1948
Martin E. Epstein	1947
William O. Foye	1947
Hanna Friedenstien	1948
Donald R. Gibbons	1947
Felix Granchelli	1948
Ira C. Gray, Jr.	1948
James C. Hamilton	1947
Walter W. Harvey	1947
Joseph Haus	1948
Edward M. Healy	1948
Earle B. Hodgdon	1947
Miyoshi Ikawa	1947
Roger W. Jeanloz	1947
Paul B. Jennings	1948
Arthur M. Kaplan	1947
Robert L. Knapp	1948
Walter E. Kuper	1947
Oscar Levine	1948
Truman S. Light	1947
John P. Longwell	1948

Weinberg Symposium

Annual Pediatric Chemotherapy-Drug Development Symposium

Presented by the Andrew H. Weinberg Memorial Fund

Dana-Farber Cancer Institute
44 Binney St., Boston, MA 02115
Dana 1820 (Smith Family Room)
November 20, 1997

Speakers:

Michael A. Friedman, M.D.
Lead Deputy Commissioner of Operations, U.S. Food and Drug Administration
Judah Folkman, M.D.
Julia Dyckman Andrus Professor of Pediatric Surgery
Director, Surgical Research Laboratories
Children's Hospital, Boston
Third speaker to be announced. ◇

Maurice A. Lynch, Jr	1947
William B. Martin, Jr.	1948
Gerald L. McLeod	1948
Alan S. Michaels	1948
Edwin J. Modest	1948
Richard G. Newman	1948
Alexander L. Nussbaum	1948
Arthur R. Olson	1948
James C. Raffi	1947
Alvin O. Ramsley	1947
Thomas Raphael	1947
Harold Reinstein	1947
Duane L. Sawhill	1948
Richard J. Schoenenberger	1947
John U. Shepardson	1948
Verity C. Smith	1948
Gilbert Spillert	1948
Robert W. Steeves	1947
Roberta A. Stewart	1947
Charles I. Sullivan	1948
Martha B. Thomas	1947
Thomas C. Thorstensen	1948
Serge N. Timasheff	1947
Warren A. Waite	1947
Karl H. Weiss	1948
M. Kent Wilson	1948 ◇

Book Review

Alfred Burger: *Understanding Medications - What the Label Doesn't Tell You* (American Chemical Society, 1995, 206 pages, ISBN 08412-3210-5)

Reviewed by Mark Mountain, Epix Medical Inc., 71 Rogers St., Cambridge, MA 02142

Dr. Burger, co-founder and editor for twelve years of the *Journal of Medicinal Chemistry*, begins his book, *Understanding Medications*, with a simple operational definition of his subject matter: "Drugs are chemical compounds that modify the way the body works." Beyond this most fundamental view of pharmaceuticals, Burger goes on to develop a short history of the early use of drugs through the Middle Ages. Continuing the historical discussion of pharmaceutical development into the contemporary era, he gives a well-balanced coverage of their uses, as well as the problems of designing, developing, and improving these compounds. Burger explores the ongoing dilemma of designing drugs powerful enough to be useful for curing ills, while making them as safe as possible by minimizing both toxicity and side effects. The issue of possible addiction is addressed as an additional, appropriate aspect to be dealt with within the scope of medicine, but not necessarily more or less important than those of safer drugs, regulatory approval, and toxicity. In this context, Burger places responsibility for addiction to drugs on the market on the end user(s), whom he considers to be both the prescribing physician and the consumer.

In subsequent chapters, Burger continues the discussion of pharmaceutical development, covering the basic sequence of drug discovery, development, manufacture and the

naming of a new drug entity. A brief discussion covering the organic chemistry of these compounds, along with how structural modifications can improve their activity, is given in a useful section for the non-scientist with a basic chemistry background. In addressing the details of the regulatory and drug approval processes, as well as the patent protection afforded new drugs, the book also provides insight into the fundamental reasons for the cost of some of the expensive new medications.

The brief chapter on "Drug Use and Abuse" covers dosage-related issues of concern to non-scientists, such as indications and contraindications, drug interactions, and a brief discussion of the issues of over-medication and of appropriate self medication. Here Burger includes a discussion of that favorite of the pharmaceutical industry, "Quackery," in which he clarifies both the rationale behind the long approval process and the intent of the Food and Drug Administration's review policy, designed to allow drugs to be marketed only if they are proven to be safe and effective.

The remaining ten short chapters contain discussions of several common therapeutic areas, the first of which could be summarized as "whole body drugs," including neurohormones, major pain relievers, antihistamines, blood pressure/heart drugs, intestinal tract medications, and hormones and vitamins. These pharmaceuticals are used for their effect on the body's overall physiology and not because they act specifically on any major organs, as some disease treating drugs do.

The discussion continues with "disease treatment drugs," which includes cancer drugs, immune response drugs, drugs for infectious diseases, and anti-parasitic and antiviral drugs. These drugs, designed to fight a specific disease or condition,

generally have a very specific organ or organ system on which they act.

This format of specific discussions of the medications for different indication groups is helpful in giving a good general historical introduction, as well as an overview of the usual medications used in these conditions, and some brief idea of the effects of these medications and why they work as they do. It is a convenient and useful breakdown for the non-scientist and the scientist alike, giving a short discussion of the effects, the physiological bases for these effects, and the best current reasoning for why the drugs are given as they are and what they do in the body.

The book contains general discussions in addition to wonderful historical anecdotes, but does assume a very basic background in biology, and chemistry or biochemistry. For the casual reader looking for an entertaining romp through the history of medicine and diseases, there is a well-developed glossary of chemical and medical terms to ease the journey. *Understanding Medications - What the Label Doesn't Tell You* is user friendly enough to be a welcome addition to any scientific bookshelf, and is a pleasant demystification of the medicine show. In explaining the relationship of medications, diseases, and people, Burger unfolds the mystery, explains how development of medicinal drugs is making life better for all of us, and conveys nicely the adventures of how we have gotten to where we are, as well as the one's that lie ahead on this path. ◇

**NESACS
Centennial**
April 24-26, 1998
Holiday Inn, Brookline

Ion Selective Electrodes

Their Development and Commercialization Part 1

by Truman S. Light (Consultant) and Martin S. Frant (Orion Research, Inc.)

The paper presented here is a summary of the talk given at the September 18, 1997 meeting of the Northeastern Section at Keene (NH) State College and a condensation of two symposium papers: (a) Frant, M.S. "Where Did Ion Selective Electrodes Come From?", The Story of Their Development and Commercialization", *J. Chem. Ed.*, 1997, 74, 159-166; (b) Light, T.S. "Industrial Use and Applications of Ion Selective Electrodes", *J. Chem. Ed.*, 1997, 74, 171-177; given at the seventh Waters Symposium, March 1996.

The Founding of Orion Research

We begin by looking at the formation and history of Orion Research. In 1961, John Riseman was a 27-year old electrical engineer who, unhappy at working for others, had started a consulting business in the medical instrumentation field, operating out of his home. Using the newest transistors which had just become available, he developed a dual-input pH meter. From his consulting experience he concluded that, to sell his meter to some company, he needed sodium and potassium electrodes to go with it.

For sodium, he searched the literature and came upon the work of George Eisenman, a medical researcher at the Pennsylvania Neuropsychiatry Institute, who had been studying the transmission of cations through cell membranes and tried to make sodium and potassium electrodes for this work. In 1957, he published the results of his group's

investigation into the effect of glass composition on selectivity for sodium and potassium ions. They had come up with what is today still the best glass composition for sodium, designated as NAS 11-18.

Riseman hired Eisenman as a consultant to what was now called "Riseman Development Laboratories". Riseman knew very little chemistry, and went to the MIT Industrial Liaison Program for help in developing electrodes. They referred him to an electrochemist, Assistant Professor Dr. James W. Ross. Ross and Eisenman first met in Riseman's kitchen.

Eisenman's NAS 11-18 sodium glass was high in alumina and was extremely high-melting, not something that could be made in Riseman's kitchen. So they turned to the Corning Glass Work's Research department for help in preparing test samples.

Corning watched the work that Riseman was doing with considerable interest. (There was another factor that may have influenced Corning's decision: According to legend, at one point in the 1930's, Arnold Beckman had approached Corning to buy his pH patent, so that he could concentrate on his duties at Cal Tech. Corning turned down the offer, apparently deciding that the electrodes used too little glass to make it worthwhile. The story was well known at Corning, and now another opportunity had appeared for getting into a high-value glass-based instrument business.)

Instead of the research contract, a much broader arrangement was negotiated. Riseman and Ross formed Orion Research, a private consulting company. Orion would do research under contract to Corning, and Corning would pay all the bills. Orion would not make a profit from the Corning contract. Instead, Orion would get a royalty from the sales of any new product they developed for Corning. Orion was now ready to

Continued on page 10

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Ion Selective Electrodes

continued from page 8

enter the field of "specific ion electrodes". The company was incorporated in May 1962, and in July Ross left MIT. There was no question of where the new company would be located. Cambridge in the early sixties was an exciting place, and Riseman felt that it had the right kind of atmosphere for a young company. Work began on new glass electrodes.

Orion's beginning investigation of new glass electrode materials was suddenly halted. A business decision by Beckman Instruments had a profound effect on the start-up company: Beckman, since its inception, had been selling pH electrodes and meters through laboratory supply dealers, such as Fisher Scientific or A.H. Thomas. They decided, instead, to sell directly, using their own sales force. This left the distributors without a major source

of pH electrodes and meters. Corning management decided, that if they could move quickly enough, this was a golden opportunity to get into this field. The decision was made in July 1962, and Corning turned to Orion to develop the new products.

By January 1963 Ross, working with Norman Hebert at Corning, had developed a new glass composition, making the first "all-purpose" pH glass (before that, glass electrodes had been useful either between pH 1 and 12 or, using a high resistance, special purpose glass, for the range pH 12-14). Orion also developed a new, transistor-based pH meter (Corning Model 12) improving on the technology Riseman had developed earlier. In a little over six months, Corning was in the market with innovative new products.

Orion turned back to the problem of making glass calcium electrodes. Ross soon made the disheartening discovery that glasses reported in the liter-

ature were non-conducting. It was here that he made a remarkable leap. "If we can't get the ion to move from the site, why not cut the bonds holding the site, and let the site move, too?" This was the concept of the liquid membrane electrode, the true starting point of the ISE revolution. The advantage of the Ross approach was that it gave a basic and reproducible system in which the selectivity depended on the structure of the water-insoluble "carrier" and the nature of the solvent, and it appeared that the limits of the ability to measure any species depended only on the ingenuity of the organic chemist. Martin Frant joined Orion at this stage, and began to explore the effect of structural changes on Ross's first calcium exchanger and solvent (the calcium salt of dioctyl phenyl phosphoric acid and dioctyl phenyl phosphonate). He had picked these because phosphate and polyphosphate form stable complexes with calcium, but not with sodium or

potassium. It was necessary to learn how to assemble and test the many possible combinations of solvent and carrier in order to quickly screen the new ideas that were being generated almost daily.

At this point, Corning's success of competing with Beckman in selling glass pH electrodes had unexpected consequences. Corning's royalty payments to Orion for pH electrodes and meters were becoming substantial and the Corning management, embarrassed, made another effort to buy Orion. For a group used to a totally free-wheeling atmosphere and the cultural milieu of the Boston area, the Corning large-company structure was not a tempting prospect. Instead, Orion agreed to give up the royalties if Corning would forget the "future non-competition" clause in the contract. The two companies separated, and became competitors. There was an understanding that the two companies

would meet in five years to discuss cross-licensing of patents developed in the interim. This might be viewed as an experiment, in which a little company, with almost no finances, started from the same technical base as a major corporation. There was no meeting in five years because Corning did not develop any significant patents in the field.

The Foxboro Company

At the point of separating from Corning, Orion had no products and no income. Its directors went to The Foxboro Company, looking for help. Foxboro said they would buy 10% of the company, if Orion could demonstrate their ability to make electrodes by developing a hypochlorite or sulfide electrode. Ross remembered a paper by Kolthoff, and wondered if that approach would work for sulfide, using silver sulfide membranes instead of silver chloride.

To be Continued

Symposium

Karen E. Wetterhahn
Memorial Symposium

September 28, 1997, 106 Steele,
Dartmouth College, Hanover, NH
106 Steele, 10:00 AM-5:00 PM

10:15 AM Prof. Stephen Lippard
(M.I.T.)

11:00 AM Dr. Kent Sugden
(Dartmouth College)

1:30 PM Prof. Judith Burtsyn
(Univ. of Wisconsin)

2:15 PM Prof. Joshua Hamilton
(Dartmouth Medical
School)

3:15 PM Prof. Thomas O'Halloran
(Northwestern Univ.)

Please note the following correction of the notice in the September 1997 *NUCLEUS*, p. 12: It has been pointed out to us that, dimethylmercury poisoning, rather than "mercury poisoning", caused the fatality. ◇

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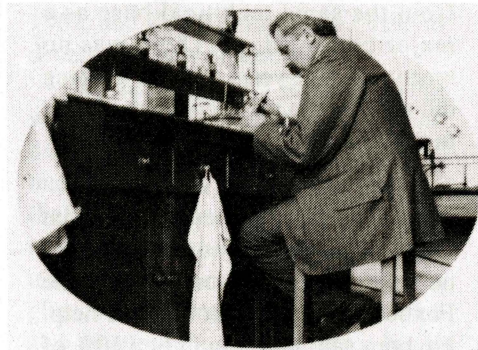
Alfred Werner's Research on the Platinum Metals (Part 2)

A CENTENNIAL RETROSPECT

By Professor George B. Kauffman

Department of Chemistry, California State University, Fresno, U.S.A.

Reprinted by permission of the author and the editor, from: *Platinum Metals Rev.*, 1997, 41, (1), 34-40. (British spelling has been changed to American practice) The first part appeared in the September 1997 issue, which also contains references 1-45.

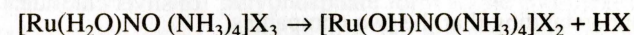


Alfred Werner in the laboratory (only known photograph)

and characterized four series of *trans*-tetraamminenitrosylruthenium(III) complexes, some of which had been previously prepared by Claus (51) and formulated by Joly (52):

- (a) $[\text{Ru}(\text{OH})\text{NO}(\text{NH}_3)_4]\text{X}_2$
(X = Br, I, NO₃, Cl)
- (b) $[\text{Ru}(\text{H}_2\text{O})\text{NO}(\text{NH}_3)_4]\text{X}_3$
(X = Br, NO₃, Cl, 1/2 SO₄)
- (c) $[\text{RuCl}(\text{NO})(\text{NH}_3)_4]\text{X}_2$
(X = Cl, 1/2 PtCl₄, I, NO₃)
- (d) $[\text{RuBr}(\text{NO})(\text{NH}_3)_4]\text{X}_2$
(X = Br, I, NO₃, 1/2 SO₄).

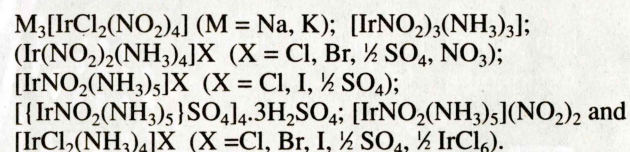
The hydroxo complex (a) was prepared by treating $\text{M}_2[\text{RuCl}_5(\text{NO})]$ with ammonia. The aqua complexes (b) are very unstable and on dissolving in water form the hydroxo complexes (a):



In his second article on ruthenium, his penultimately published article, Werner and A. P. Smirnoff prepared the corresponding hydroxonitrosylbis(ethylenediamine)ruthenium(III) compounds, $[\text{Ru}(\text{OH})\text{NO}(\text{en})_2]\text{X}_2$ (corresponding aqua complexes do not exist) (20). Several modern reviews have been devoted to transition metal nitrosyl complexes (53 - 55).

Iridium

The first of Werner's two articles on iridium complexes (15) was co-authored with his assistant Otto de Vries (56), son of the Dutch botanist Hugo Marie de Vries, who proposed the mutation theory. They prepared and characterized a number of iridium(III) complexes, which they found to be analogous to the corresponding cobalt(III) complexes, but much more stable. The compounds included:



In his second article on iridium (20), published posthumously with his assistant A. P. Smirnoff, Werner prepared and resolved into enantiomers two series of iridium(III) complexes: *cis*- $[\text{Ir}(\text{NO}_2)_2\text{en}_2]\text{X}$ and $[\text{Iren}_3]\text{X}_3$, using silver α -(+)- and (-)-camphorsulfonate and sodium α -(+)-nitro-

continued on page 13

camphorate, respectively, as resolving agents (44, p. 137). The *cis*- $[\text{Ir}(\text{NO}_2)_2\text{en}_2]\text{X}$ compounds closely resemble the *cis*- $[\text{Ir}(\text{NO}_2)_2(\text{NH}_3)_4]\text{X}$ salts first prepared by Werner and de Vries (13). As no *trans* compounds were isolated, the resolutions simultaneously proved the *cis* configuration and with the resolution of $[\text{Iren}_3]\text{X}_3$, confirmed the octahedral configuration for iridium that had been proposed in 1914 by Delépine (57). Delépine and Charonnat's "active racemate" method (58) and Mathieu's rotatory dispersion studies (59) confirmed Werner's solubility rule (16, 60, 61) and showed that the (-)- $[\text{Iren}_3]^{3+}$ ion possesses the same configuration as the (+)- $(\text{Coen}_3)^{3+}$, (+)- $[\text{Cren}_3]^{3+}$, and (-)- $[\text{Rhen}_3]^{3+}$ ions.

Rhodium

The two papers that Werner published on rhodium complexes were part of his program to determine the influence of the nature of the central metal atom on optical rotatory power (32). In 1912 Werner was the first to prepare the extremely stable tris(ethylenediamine)rhodium(III) salts, specifically for the purpose of attempting their resolution (16; 44, p. 135; 62). In the first of his two articles titled "Über Spiegelbild-Isomerie bei Rhodium-Verbindungen" (16), he not only established the existence of optical isomerism and the octahedral configuration for another metal - the first configuration for a platinum metal - but he also enunciated a valuable empirical rule for determining the generic configuration of optically active complexes, the previously mentioned principle which became known as Werner's solubility rule that he later developed and extended (60). Together with the rotatory dispersion technique developed by Mathieu (59), it is probably the most important method for determining the relative configuration of complexes.

Werner had realized that the absolute configuration of a complex cannot be determined directly from the sign of optical rotation (60, 63). According to his solubility rule, all antipodes of a corresponding type which give the least soluble diastereoisomer with a given resolving agent have the same absolute configuration, regardless of the sign of rotation. Applying this rule to the resolution of the $[\text{Men}_3]^{3+}$ complexes of cobalt(III), chromium(III), and rhodium(III) by means of (+)-nitrocamphorates and (+)-tartrates, Werner concluded that the (+)- $[\text{Coen}_3]^{3+}$, (+)- $[\text{Cren}_3]^{3+}$, and (-)- $[\text{Rhen}_3]^{3+}$ cations possess the same absolute configuration.

The stable, water-soluble trioxalatorhodates(III) were discovered by Leidié in 1899 (64). In his second rhodium article, in 1914 (17), Werner and J. Poupardin, resolved the potassium salt of trioxalatorhodates(III) with strychninium nitrate and then isolated the sodium, rubidium, and barium



Alfred Werner (right) and fellow student Arturo Miolati outside the Eidgenössisches Polytechnikum, in January or February, 1893. Fellow students Franz Feist and Roland Scholl are peeping from the door

salts. They found that the rhodium salts do not racemize appreciably, even in hot solution, and are much more stable than the corresponding chromium compounds (44, p. 136). Also, by cooling a hot, concentrated solution of the racemic mixture, they claimed to obtain hemihedral crystals of (+) and (-)- $\text{K}_3[\text{Rh}(\text{C}_2\text{O}_4)_3]$, which they separated mechanically with the aid of a microscope. This would have been the first successful application of Pasteur's method of spontaneous resolution by conglomerate crystallization to coordination compounds. Jaeger was unable to duplicate their results with this compound (65), but he and Thomas were able to resolve $\text{K}_3[\text{Co}(\text{C}_2\text{O}_4)_3]$ into its optical antipodes in a similar manner (66, 67). Some questions have arisen about the number of molecules of water of crystallization contained in optically active $\text{K}_3[\text{Rh}(\text{C}_2\text{O}_4)_3]$, and

Bernal and Kauffman have recently questioned discrepancies in some of Werner and Poupardin's results (68). In the dissertation of Wera Tupizina, one of Werner's numerous Russian Doktorandinnen, the resolution of $[\text{Rh}(\text{C}_2\text{O}_4)_2\text{en}_2]\text{X}$ ($[\alpha] = +153^\circ$ to $+275^\circ$) is mentioned, but the work was never published (69).

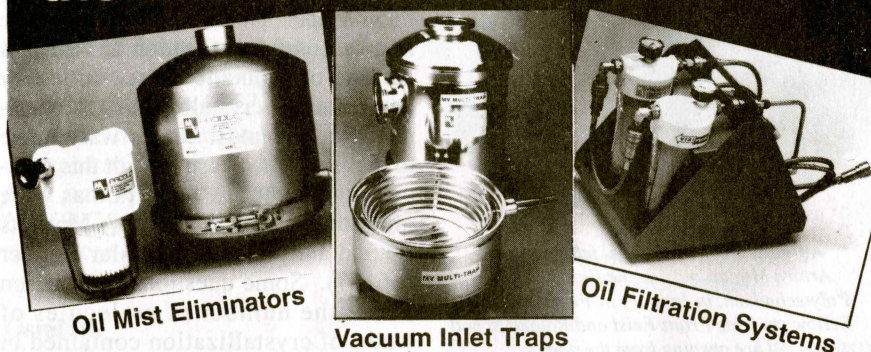
Alfred Werner not only made a number of valuable contributions to the chemistry of the platinum metals, but he also used these results to introduce the concept of optical activity, so widespread in organic chemistry, into inorganic chemistry.

References

46. K. Dehnicke and J. Strähle. *Angew. Chem., Int. Ed. Engl.*, 1981, 20, 413
47. W.P. Griffith, *Coord. Chem. Rev.*, 1972, 8, 369
48. K. Dinklage, *ber Osmium-Stickstoff Verbindungen*, Dissertation, Universität Zürich, 1902
49. A.F. Clifford and C.S. Kobayashi, *Inorg. Synth.*, 1960 6, 204
50. W.P. Griffith and D. Pawson, *J. Chem. Soc., Dalton Trans.*, 1973, 1315
51. C. Claus, *Bull. Akad. Petersb.*, 1860, [3], 1, 122; 1862, [3], 4, 455; *J. prakt. Chem.*, 1860, 79, 57; 1861, 85, 129
52. A. Joly, *Compt. rend.*, 1888, 107, 994; 1890, 111, 970
53. J.H. Enemark and R.D. Feltham, *Coord. Chem. Rev.*, 1974, 13, 339
54. K.G. Caulton, *Coord. Chem. Rev.*, 1975, 14, 317
55. F. Bottomley, *Coord. Chem. Rev.*, 1978, 26, 7
56. O. de Vries, "Over Complexe Iridiumverbindungen", Dissertation, Rijks-Universiteit te Leiden, 1908
57. M. Delépine, *Compt. rend.*, 1914, 159, 239
58. M. Delépine and R. Charonnat, *Bull. Soc. Chim. Fr. Minér.*, 1930, 53, 73

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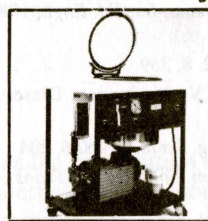
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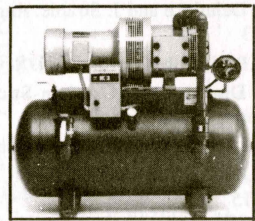
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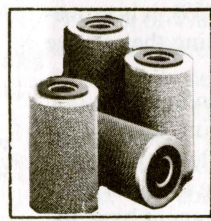
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Alfred Werner

continued from page 13

- J.-P. Mathieu, *Compt. rend.*, 1934, **199**, 278; *J. Chim. Phys., Rev. Gen. Colloides*, 1936, **33**, 78
- A. Werner, *Bull. Soc. Chim. Fr.*, 1912, [4], **11**, No. 14, 1 (in French); for an English translation see *Am. Chem. J.*, 1912, **48**, 314
- A. Werner, *Ber.*, 1912, **45**, 121
- F. Galsbøl, *Inorg. Synth.*, 1970, **12**, 269
- A. Werner, *Ber.*, 1911, **44**, 3279
- E. Leidié, *Compt. rend.*, 1899, **129**, 1251
- F.M. Jaeger, *Proc. Kon. Ned. Akad. Wetensch.*, 1917, **20**, 263
- F.M. Jaeger, *Rec. Trav. Chim. Pays-Bas Belg.*, 1919, **38**, 250
- F.M. Jaeger and W. Thomas, *Proc. Kon. Ned. Akad. Wetensch.*, 1919, **21**, 693
- I. Bernal and G.B. Kauffman, *Struct. Chem.*, 1993, **4**, 131
- W. Tupizina, "Untersuchungen über die optische Aktivität von Kobaltverbindungen", Dissertation, Universität Zürich, 1915 ◊

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Member News

Paul D. Bartlett celebrated his 90th birthday on August 14, 1997.

He chaired our Section in 1953, received the Richards Medal in 1966, the ACS Norris Award in Physical Organic Chemistry, sponsored by our Section, in 1969 and the Norris Award for Outstanding Achievement in the Teaching of Chemistry in 1978. In addition, he has received numerous prizes, awards, and several honorary degrees. Since 1934 he had been on the faculty of the Chemistry Department of Harvard University, as Erving Professor from 1948 until becoming Professor Emeritus in 1975. From 1974 - 1985 he was a Robert A. Welch Research Professor at Texas Christian University. After retiring from that position he has returned to this area and lives in Lexington, MA. Our best wishes to you, Paul. ◊

Historical Notes

by Edward R. Atkinson, Amherst, Mass.

We present here short biographies of chemists and chemical engineers whose deaths have been reported to us during the past 12 months. As in the past, we have been unable to acquire biographical data from the press or from the estates of the deceased for about half the number reported by the national ACS office.

Salvatore F. Amico, 83, died on March 15, 1997. He was a Boston native who received the B.S. in chemical engineering at Northeastern University in 1936. During World War II he was involved in the development of a diode that was needed for radar and obtained a patent for the device. He subsequently was employed as a chemical engineer at the Sylvania Electronics Co. in Boston and at the

Bomac Co. in Beverly. Before retiring he worked for the Internal Revenue Service in Andover, Mass.

Doris Bullard, 90, died on January 14, 1997. She was a lifelong resident of Holliston, Mass. and active in community affairs. She taught chemistry at Framingham State College until retirement in 1970. Her associates at Framingham recall that she was a very well-liked teacher.

Elene W. Farello, 90, died May 15, 1997. She was a native of Jonesport, Maine and a graduate of Boston's Girls High School (1925) and Boston State College (1929). She taught science subjects in the Boston public schools until 1939, then moved to the Wilmington, Mass. school system and remained there until retirement in 1972. A teacher of chemistry, physics, biology, she became chairwoman of the science department in 1942. During her years as a teacher she attended graduate programs at Harvard, M.I.T., Northeastern University, and Union

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Historical Notes

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College. The Ed.D. degree was granted by Calvin Coolidge College in 1960. Miss Farello was a member of the New England Association of Chemistry Teachers and of several other professional associations. During World War II she was a sergeant in the Women's Defense Corps and also served in the Transport Division of the National Guard. In Wilmington she was a leader in the Girl Scout troop. **Mary Peters Fieser**, 87, died in her Belmont home on March 22, 1997. An outstanding chemist, teacher, and author, she served her profession at Harvard University for over 60 years. Her official title there was Research Associate to her late husband, Louis P. Fieser who died in 1977. Following his death Mary remained active in professional affairs and published 11 additional volumes of the well-known series *Reagents for Organic Synthesis* which she and Louis had co-authored, along with several other texts in organic chemistry. Prof. E.J. Corey has remarked that "Mary was like a mother to generations of graduate and undergraduate students and was a major figure in our department." The organic chemistry teaching laboratory in the Harvard Science Center has been named after Mary and Louis Fieser.

More complete biographical data may be found in *Chem. Eng. News*, April 14, 1997, p.14 and in the *Boston Globe* for Wednesday, March 26, 1997. It was my good fortune to see Mary when she accompanied Louis to meetings of the Ouroboros Club. I used to kid her about my using her marked parking space at the Harvard labs when attending concerts at Sanders Theater.

Mark Hyman, Jr., 84, died on June 2, 1997 while on a visit to Denmark. He was a New York native who received the B.S. at Harvard University in 1934, the M.S. in chemistry at Columbia University and the M.S. in chemical engineering at M.I.T. in 1939. After employment at the

Polaroid Corporation until 1950 he founded the Pilot Chemicals Co. which developed chemicals used in the detection of atomic radiation. Pilot merged with the New England Nuclear Co. in 1962. Mr. Hyman later founded the Solar Heat Corporation which built several solar homes in the Boston area. He was a founding member of the Ethical Society of Boston and served as its president in 1967.

Marion Macdonald, 102, died on March 15, 1997 after a brief illness. She was a Boston native and a 1919 graduate of what is now Framingham State College. A graduate degree in chemistry was obtained at Boston University in 1924. She taught home economics at Framingham and later at Simmons College until retirement at age 76. She then became a volunteer at the China Trade Museum in Milton, Mass. during the years before the museum moved to Salem, Mass.

Ferdinand P. Mehrlich, 91, died on January 30, 1997. He was a Cincinnati native, an honors graduate of Butler University, and a 1930 recipient of the Ph.D. at the University of Wisconsin. After a postdoctoral period at Cornell University he was employed as a consultant by the General Foods Corporation, the National Planning Association of Washington, and the Cocoa Research Institute. He was involved in a variety of food production problems in South and Central America. He received a patent for the a compound which delayed the ripening of pineapples.

Mr. Mehrlich became a technical director for the Food and Container Institute of the Armed Forces in Chicago, then came to the U.S. Army Natick Center in 1958 as director of the food and engineering departments that were charged with the development of feeding systems for the Department of Defense and for the NASA space program. In 1964 he received the Army's Meritorious Civilian Service Award.

to be continued

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All of the above are available free of charge.

C. Listings

1. Employer Mailing Lists - a list of employers in the USA, by states, who have used ACS employment services.
2. The list of positions available and employers registered at the Las Vegas Meeting

D. Resumes

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Employers may list positions available. Members who currently have resumes on file are asked to telephone Arlene Light at 617-862-3048 to verify that their resume is to remain on file. Resumes that have not been confirmed will be deleted November 1, 1997.

Information about all of the above may be obtained by calling Truman or Arlene Light at 617-862-3048 or by e-mail: tslight@aol.com. ACS members in New Hampshire may contact Sonja Fetela at 603-352-1415, or by e-mail: info@polyonics.com

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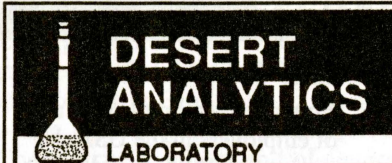
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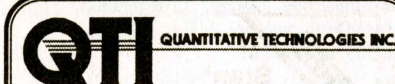
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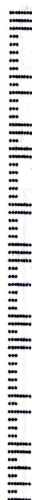
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Prof. Tony Case (Imperial College, London)
"Protein Engineering - A Tool for the
Development of Molecular Sensors"
Tufts University
Pearson Hall, Rm 106, at 4:30 PM

Sept. 30

Prof. Philip Anfinsen (Harvard Univ.)
"Biology from Femtoseconds to Microseconds:
New Insights from Time-resolved Infrared
Studies of Myoglobin and Bacteriorhodopsin"
Brandeis University Gerstenzang,
Rm 122, at 4:00 PM

Oct. 1

Dr. Bill Warren (Waters, Inc.)
"HPLC Analysis of Biomolecules Using
Advanced Spectral Techniques."
UMass Dartmouth Sci. & Eng. Bldg.,
Rm. 305, at 4:00 PM

Oct. 2

Prof. Craig Merlic (Univ. California, LA)
TBA
Boston College Merkert Chemistry Ctr.,
Rm 127, at 4:00 PM

Oct. 7

Prof. Lynmarie Thompson (UMass, Amherst)
"NMR Studies of Structure and Conformational
Changes in Transmembrane Chemotaxis
Receptors"
Brandeis University Gerstenzang,
Rm 122, at 4:00 PM

Prof. Gene Davidson (Georgetown Sch. Med.)
"Regulation of Mucin Gene Expression"
M. I. T.
Faculty Club, Glycobiology Dinner Meeting at
6:30 PM
Call (617) 642-0025 for reservations

Prof. Franz Hillenkamp (Univ. Münster, Germany)
MALDI-MS: Widespread Use, but Limited
Understanding
Northeastern University Hurtig Bldg.,
Rm. 127, at 4:00 PM

Dr. Douglas Worsnop (Aerodyne Research, Inc.)
"Heterogeneous Acid Solution Chemistry in the
Laboratory and in the Atmosphere"
Tufts University Pearson Hall,
Rm 106, at 4:30 PM

Oct. 8

Prof. Jean-Marie Lehn (Univ. Louis Pasteur)
"Supramolecular Chemistry: Concepts and
Perspectives"
Boston College Merkert Chemistry Ctr.,
Rm 127, at 8:00 PM

Dr. Carmela Amato-Wierda (Univ. New
Hampshire)
"Molecular Beam Mass Spectrometry in Vapor-
Phase Processing of Materials." UMass
DartmouthSci. & Eng. Bldg.,
Rm. 305, at 4:00 PM

Oct. 9

Prof. Jean-Marie Lehn (Univ. Louis Pasteur)
"Molecular and Supramolecular Devices"
Boston College Merkert Chemistry Ctr.,
Rm 127, at 4:00 PM

Oct. 10

Prof. Jean-Marie Lehn (Univ. Louis Pasteur)
"From Molecular Recognition towards Self-
Organization"
Boston College Merkert Chemistry Ctr.,
Rm 127, at 4:00 PM

Oct. 14

Dr. Joseph Hogan, Jr. (ArQule, Inc.)
"High Throughput Screening for Drug
Development"
Tufts University Pearson Hall,
Rm 106, at 4:30 PM

Oct. 15

Dr. Marie C. Messmer (Lehigh Univ.)
"A Microscopic Look at Buried Interfaces: A
Non-Linear Spectroscopic Investigation."
UMass Dartmouth Sci. & Eng. Bldg.,
Rm. 305, at 4:00 PM

Oct. 21

Prof. James Coe (Ohio State Univ.)
"Approaching Bulk Water Through Clusters: the
Payoff when Cluster Work Connects to Bulk"
Brandeis University Gerstenzang,
Rm 122, at 4:00 PM

Prof. Louis Carpino (UMass Amherst)
"New Azabenzotriazole-Based Peptide Coupling
Reagents. Recent Results and Mechanistic
Considerations"
Tufts University Pearson Hall,
Rm 106, at 4:30 PM

Oct. 22

Dr. James Manning (Northeastern Univ.)
"What We Can Learn About Sickle Cell
Hemoglobin Abnormalities Through Chemistry
and Recombinant DNA"
UMass Dartmouth Sci. & Eng. Bldg.,
Rm. 305, at 4:00 PM

Dr. Stephen E. Kahn (President, Amer. Assoc.
Clinical Chemists)
"National Initiatives, Including Delta Group:
Comments on Homocysteine and Folate"
NEAACCC Educational Program
DoubleTree Guest Suites Hotel, Waltham, 6:00-
9:00 PM
Reservations, call Dr. David Drum (617) 732-
6987, page 11161 or fax 617-235-3873

Oct. 28

Prof. Jayendran Rasaiah (Univ. Maine)
TBA
Brandeis University Gerstenzang,
Rm 122, at 4:00 PM

Oct. 29

Prof. Fleming Crim (Univ. Wisconsin, Madison)
"Controlling Photodissociation Pathways and
Watching Energy Flow in Vibrationally Excited
Molecules"
Tufts University Pearson Hall,
Rm 106, at 4:30 PM

Dr. Michael Henchman (Brandeis Univ.)
"Chemistry in the Artist's Studio: Identifying
Fakes and Restoring Artwork"
UMass Dartmouth Sci. & Eng. Bldg.,
Rm. 305, at 4:00 PM

Oct. 30

Prof. William Scott (Indiana Univ.)
"Crystallographic Snapshots of RNA Catalysis"
Boston College Merkert Chemistry Ctr.,
Rm 127, at 4:00 PM

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Calendar should be sent to:
Prof. Cathy Costello
Mass Spectrometry Resource
Dept. of Biophysics
Boston Univ. Med. Ctr., R-806
Boston, MA 02118-2394
Tel.: (617) 638-6490
Fax: (617) 638-6491, 638-6761
Email: cecmsms@bu.edu

Calendar

Sept. 23

Prof. Janos Lanyi (Univ. Cal., Irvine)
"Proton Transfer Pathways and Vectoriality in
the Light-Driven Proton Pump,
Bacteriorhodopsin"
Brandeis University
Gerstenzang, Rm 122, at 4:00 PM

Prof. Harry Schachter (Univ. Toronto)
"Congenital Diseases Involving Defects in
Complex N-glycan Synthesis"
M.I.T.
Faculty Club, Glycobiology Dinner Meeting, 6:30 PM
Call (617) 642-0025 for reservations

Prof. Chi-Huey Wong (The Scripps Research Inst.)
"Intervention of Carbohydrate Recognition"
Tufts University
Pearson Hall, Rm 106, at 4:30 PM

Sept. 24

Dr. David Austin (Yale Univ.)
"Design and Construction of a General Scaffold
for Macromolecular Ligand Binding"
UMass Dartmouth
Sci. & Eng. Bldg., Rm. 305, at 4:00 PM

Prof. Timothy Swager (Mass. Inst. of Tech.)
"Enhanced Sensitivity in Sensory Materials:
Conducting Polymer-Based Polyreceptor and
Transition Metal Assemblies"
Boston College Merkert Chemistry Ctr.,
Rm 127, at 4:00 PM

Sept. 25

Prof. Edward Solomon (Stanford Univ.)
"Oxygen Intermediates in Multicopper Oxidases"
Boston College Merkert Chemistry Ctr.,
Rm 127, at 4:00 PM

Karen E. Wetterbalm Memorial Symposium
Dartmouth College. see page 11