

THE NUCLEUS

December 1994

Of the Northeastern Section of the American Chemical Society

Vol. LXXIII, No. 4

Monthly Meeting

*Chiral Synthesis and Resolution
Symposium Jointly with the
Medicinal Chemistry Group*

ACS Council Meeting

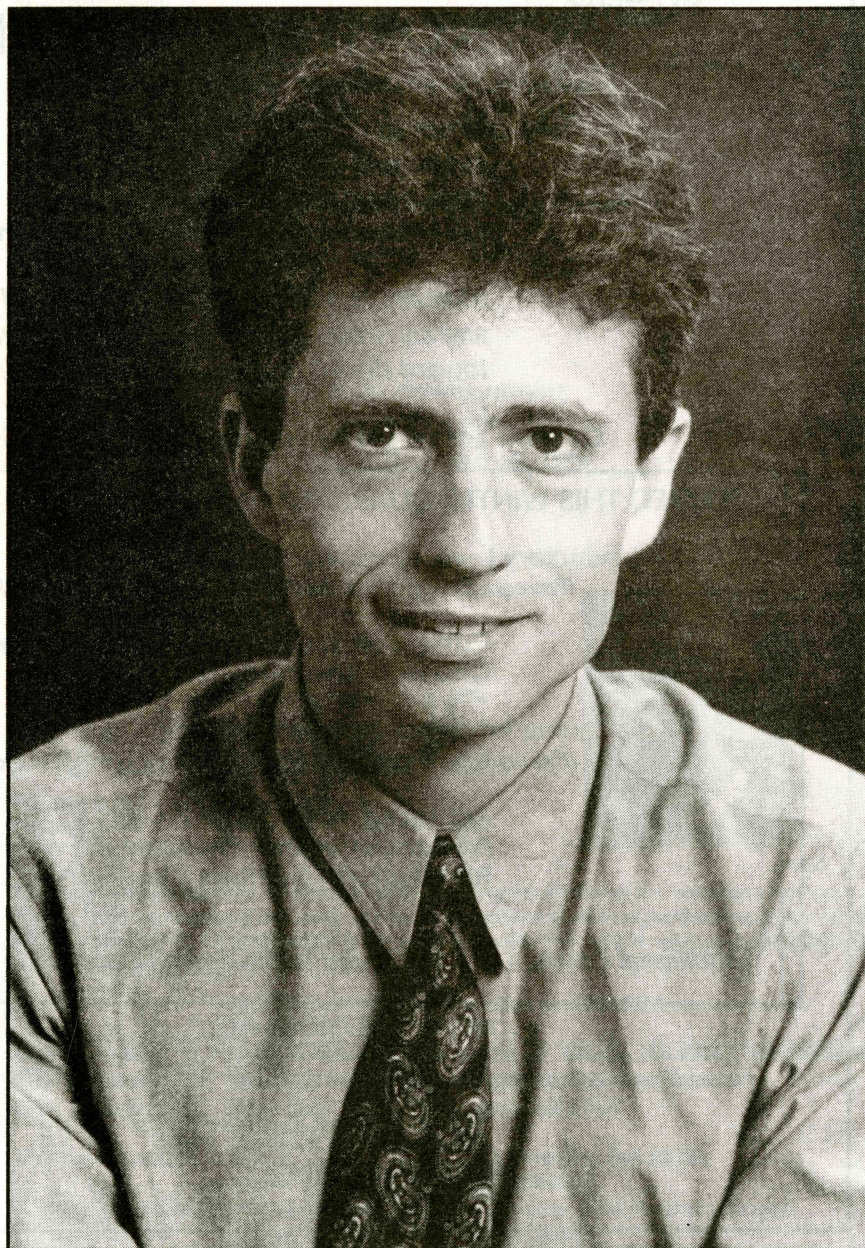
Report of the Fall Council Meeting

Member News

Awards to members

Historical Notes

*Obituaries of recently deceased
members*



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Contents

NESACS Nominations 4

Call for nominations for 1996 officers and elected committees

ACS News 4

New employment aids available

ACS Council Meeting 4

Brief report of the actions taken at the August 24 Council Meeting
in Washington

Monthly Meeting 5

Joint Symposium with the Medicinal Chemistry Group on
Chiral Synthesis and Resolution

Historical Notes 7

Start of a new set of obituaries of recently deceased members

Member News 9

Awards to NESACS members and students

Cover: Prof. Eric N. Jacobsen, the evening speaker
(photo: Stu Rosner, Charlestown, Mass.)

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THE NUCLEUS

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NESACS Elected Positions

Nominees are solicited for Chairman-Elect (1 year); Secretary (2 years), Trustee (3 years), Councilors and Alternate Councilors (3 years). The Chairman-Elect serves as Program Chairman and succeeds to the chairmanship of the Section the following year. Chairmen-Elect have alternated between those from industry and academia; the 1996 position will be from Industry. Councilors represent the Section at ACS Council meetings and are expected to attend the Fall and Spring national ACS meetings. Alternate Councilors may be called upon to represent the Section when a Councilor is unable to be present. Also elected will be members of the following committees: Nominating(1 year), Richards Medal Committee (4 years), Esselen Award (4 years). The positions are for terms beginning January 1, 1996, the election will be in May 1995.

If you are interested in being nominated for one of these positions or would like more information, please contact the 1995 chairman of the Nominating Committee, Dr. James A. Kaufman at (617) 237-1335. ◇

ACS News

New Employment Aids reported by Truman Light

At the Washington National ACS Meeting new employment aids were announced.

A unique job search service: "ClassiFACTS", replacing the ACS publication CHEMJOBS USA. ClassiFACTS surveys employment ads in 40+ major metropolitan newspapers and brings instant access to the subscriber. For further information and charges, call (800) 678-CHEM (2436).

Council Meeting

August 24, 1994

Prepared by Doris I. Lewis

The Northeastern Section was represented by M. Chen, C. Costello, T. Gilbert, E. Hopkins, T. Light, P. Samuel and V. Wilcox.

The Council unanimously approved the Bylaw amendment on Membership Requirements. The purpose of the amendment was "...the need to have governance documents mirror that the Society is for all chemists with a bachelor's degree..." and "...to destroy the perception that the Society is solely for Ph.D. chemists..."

In addition, Article X, Sec. 6 and Bylaw V were amended successfully to be consistent in the use of "candidate" and "nominee" and to clarify the process by which a President is elected, should a vacancy occur. All Northeastern Section Councilors voted in the affirmative.

In other actions, the Probationary Division of Chemical Technicians was approved for full division status, with all NESACS Councilors in the affirmative. Similarly, changes in the wording of the objects of the Division of Nuclear Chemistry and Technology and of the Division of Polymer Chemistry were approved.

continued on page 7

Two new ACS videos from the Department of Career Services were announced: "Career Transitions: Catalyst for Change" and "Formula for Success: Turning Job Leads to Gold." These videos will be available for Northeastern Section showing during the social hours preceding coming monthly meetings or upon request to the NESACS Employment Services Committee. Members are: Leon Rubin, chairman of the Professional Relations Committee (617-332-5785), Anthony Bevilacqua (617-890-3399) and Truman/Arlene Light (617-862-3048). ◇

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Nominations

Philip L. Levins Memorial Prize

Nominations for the Philip L. Levins Memorial Prize for outstanding performance by a graduate student on the way to a career in chemical science should be sent to the Executive Secretary, NESACS, 23 Cottage St., Natick, MA 01760 by March 1, 1995. The graduate student's research should be in the area of organic analytical chemistry and may include other areas of organic analytical chemistry such as environmental analysis, biochemical analysis, or polymer analysis. Nominations may be made by a faculty member, or the student may submit an application. A biographical sketch, transcripts of graduate and undergraduate grades, a description of present research activity and three references must be included. The nomination should be specific concerning the contribution the student has made to the research and publications (if any) with multiple authors.

The award will be presented at the May 11, 1995 Section Meeting. ◇

Monthly Meeting

The 766th Meeting of the Northeastern Section, ACS

Medicinal Chemistry Group Symposium – Chiral Synthesis and Resolution

Thursday, December 15, 1994, Boston College, Chestnut Hill, MA
Shea Room, Conte Forum

3:00 Coffee

3:30 Jorge L. López and Roger B. Bakale, Sepracor, Inc. – *Resolution of Methyl Methoxyphenyl Glycidate and Chiral Synthesis of (1S,2R)-cis-1-Aminoindan-2-ol*

4:30 Jim Lalonde, Altus Biologics, Inc. – *Cross-Linked Enzyme Crystals in Organic Synthesis*

5:30 Social Hour

6:30 Dinner

8:00 Evening Meeting

Dr. James Kaufman, Chairman, Northeastern Section, presiding
Eric N. Jacobsen, Harvard University – *Synthetic and Biological Catalysts for Asymmetric Synthesis*

Refreshments will be served after the program.

Dinner reservations should be made no later than December 8. Please call Marilou Cashman at (800) 872-2054. Reservations not cancelled at least 24 hours in advance must be paid. Members, \$21.00; Non-members, \$23.00; Retirees, \$12.50; 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.

Parking in garage next to Forum. Enter from Beacon St.

Next meeting: January 12, 1995, at 5:30 p.m. (social hour), evening meeting at 8:00 p.m., at Curry College, Milton, MA. Dr. Dorothy Phillips of this Section will speak on her recent work in Chromatography.

Biographies

Jorge L. López obtained a B.S. in Chemical Engineering at the University of Puerto Rico. He holds an M.S. and Ph.D. (1983) in Chemical and Biochemical Engineering from the University of Pennsylvania where he worked under Prof. John A. Quinn in the development of novel membrane bioreactors. He joined the faculty at the University of Puerto Rico, heading a group which created the Industrial Biotechnology program of studies. In 1986 he joined Sepracor as Senior Research Engineer. He developed a number of enzyme based stereochemical resolution processes, one of which has already been developed to commercial scale. He currently is the Director, Process Research and Development, Chiral Chemicals Division.

Roger P. Bakale obtained B.S. degrees in Chemistry and Biology from Hope College. He joined Warner-Lambert/Parke Davis Corp. Chemical Process Development Division where he focused on drug development of new anxiolytic agents and ACE inhibitors. After three years he went to Wayne State University and in 1988 he received a Ph.D., working with Prof. Carl R. Johnson on the development of new synthetic methodology of organotin compounds. He joined Bristol-Myers Squibb Pharmaceutical Research Institute, Chemical Process Technology, where he contributed to the development of semi-synthetic Taxol, HMG-CoA Reductase Inhibitors, Carbocyclic Nucleosides, Thromboxane A-2 Antagonists and ACE inhibitors. In 1993 he joined Sepracor, Inc. as Manager, Chemical Process Development, Chiral Chemicals Division, where he is work-

ing on chiral synthesis and resolution of single isomer drugs (ICE)[™], and on the development of chiral chemicals and intermediates (ChiRedox)[™].

Jim Lalonde obtained a B.S. degree from Lakehead University(Canada) in 1983 and received an NSERC Graduate Fellowship. He received a Ph.D. from Texas A&M University in 1987 for his work on "Nitrogen Stabilized Carbanions in the Synthesis of Chiral Non-Racemic Compounds" in David Bergbreiter's group. His interest in biocatalysis led to a post-doctoral stay in Chi-Huey Wong's lab until 1989. From 1989-1993 he was employed at Vista Chemical, developing stable proteases and an enzyme-based synthesis of surfactants. He is currently employed as a Staff Scientist at Altus Biologics.

Eric N. Jacobsen is a native of New York, N.Y.. He obtained a B.S. from New York University in 1982. Undergraduate research was with Prof. Yorke Rhodes. He obtained a Ph.D. at the University of California, Berkeley in the field of organometallic chemistry, under the direction of Prof. Robert Bergman. In 1986 he received a post-doctoral Fellowship at M.I.T. with Barry Sharpless, where he was one of the initiators of the asymmetric catalytic dihydroxylation project. In 1988 he accepted a faculty position at the University of Illinois and was promoted to Associate Professor in 1991. In 1993 he was appointed Professor of Chemistry at Harvard University and currently directs a research group of about 20 graduate students and post-docs. He also is a consultant at Merck, Sepracor, Exxon and Eukarion.

Eric Jacobsen's research interests lie in the discovery and elucidation of new, synthetically valuable reactions, with special emphasis on selective catalysis.

Awards he has received include the NSF Presidential Young Investigator Award, the Packard Fellowship, The Camille and Henry Dreyfus Teacher-Scholar Award, the Alfred P. Sloan Foundation Fellowship, the Cope Scholar Award, and the Fluka Prize. ◇

Abstracts

Resolution of Methyl Methoxyphenyl Glycidate and Chiral Synthesis of (1S,2R)-cis-1-Aminoindan-2-ol

The chiral intermediate methyl methoxyphenyl glycidate (MMPG) is the starting chiral intermediate for the production of the drug Diltiazem, a calcium channel blocker. A number of enzymes have been identified capable of hydrolyzing the undesired isomer from a racemic mixture of this glycidic ester. The reaction product from this hydrolysis is unstable and quickly decomposes to an aldehyde. The low solubility of the ester in water coupled with need to reuse the enzyme and handle the aldehyde by-product represents a challenging biochemical reactor engineering problem. A multiphase membrane bioreactor approach has been used to overcome these and other problems associated with this resolu-

tion. The process is presently being practiced on a commercial scale (560 MT/yr) in Japan.

This presentation will review the bench and pilot-scale research and development work conducted by Sepracor/Tanabe leading to the installation of this commercial facility. Results from enzyme screening studies, aldehyde by-product handling strategies, membrane reactor process optimization and final operating conditions, unreacted substrate recycling strategy, process material balances, and a comparison of pilot vs. bench scale data will be presented.

(1S,2R)-cis-1-Aminoindan-2-ol is the chiral starting material for the production of the Merck HIV-1 Protease Inhibitor L-735,524. The Sepracor synthesis of this important intermediate is based on asymmetric epoxidation known as the Jacobsen epoxidation. The synthetic challenges of this class of HIV Protease Inhibitors are enhanced by the need for low cost synthesis of high quality chiral molecules at 100's MT/yr scale. This presentation will provide a brief overview of the

project, and a review of the Process Research and Development effort including the synthetic routes and pilot production campaigns directed toward the synthesis and supply of (1S,2R)-cis-1-Aminoindan-2-ol.

Cross-Linked Enzyme Crystals in Organic Synthesis

Despite the enormous potential of enzymatic catalysis, few enzymes are used in the synthesis of fine chemicals or pharmaceuticals. Three major problems preclude wide acceptance of enzymes: low operational stability, high cost, and in some cases, inadequate stereoselectivity. Cross-Linked Enzyme Crystals (CLEC's) meld the exquisite selectivity and activity of enzyme catalysts with the ruggedness and utility of traditional chemical catalysis. The basis of the methodology lies in the cross linking of highly pure enzyme microcrystals with bifunctional reagents such as glutaraldehyde. Such cross-linked enzyme crystals remain active and insoluble in environments that are otherwise incompatible with enzyme function; including multiple reaction cycles, prolonged exposure to high temperatures, near anhydrous organic solvents and aqueous-organic solvent mixtures. The synthetic utility of CLEC's of proteases, lipases, esterases, and penicillin acylase in the preparation of pharmaceuticals and peptides will be presented with particular emphasis on the preparation of single enantiomers of the profens, peptides and other chiral molecules.

Synthetic and Biological Catalysts for Asymmetric Synthesis

Researchers aiming to discover new and useful reactions do well to draw from the world of biocatalysis, either directly for answers, or indirectly, if simply for inspiration. Enzymes fulfill their role as catalysts in living systems by effecting an array of remarkable chemical transformations with high selectivity and energetic efficiency, with minimization of byproducts, and with rapid rates. Each of these features is highly desir-

able from the standpoint of laboratory or industrial-scale synthesis, particularly since issues of cost, absolute stereochemistry, and waste generation have become primary considerations in specialty chemical synthesis. However, enzymes can also be very limited as catalysts for organic synthesis, given the high substrate specificity and product inhibition they often exhibit, their high molecular weights, and the limited range of reaction conditions they tolerate. Biomimetic synthetic catalysts can, in principle, overcome these limitations, yet still retain the desirable features of enzymes. This lecture will provide an overview of my group's work in the field of selective catalysis, highlighting the successful application of mechanistic insights into enzymatic systems to the design of practical synthetic catalysts. ◇

Council Meeting

continued from page 4

Locations for the meetings in 2004 and 2005 were approved. By a divided vote of 209 to 116 the registration fees for National Meetings, starting with the Spring 1995 meeting were increased by \$10 to avoid meeting budget deficits forecast for 1995, at current registration fees. Chen, Costello, Gilbert, Hopkins, Lewis and Light voted in favor, Samuel and Wilcox voted against the increase.

Michael Strem of this Section (Councilor for the Division of Small Chemical Businesses) was reelected to membership on the Committee on Committees for 1995-97.

Truman Light reported that he helped to train volunteers from the Washington Section for work at the National Employment Clearing House (NECH) during the meeting and he also assisted the 1500 applicants and 125 employers at the NECH. These numbers show a steadily increasing unemployment among chemists. (See the July 11, 1994 issue of *Chem. & Eng. News*. However, he also met many chemists who succeeded in obtaining employment, fulfilling the motto of NECH "It works-I found a job through NECH". ◇

Historical Notes

by Edward R. Atkinson, Amherst, Mass.

In this and the following issues we publish short biographies of fellow chemists and chemical engineers whose deaths have come to our attention prior to October 1, 1994. As in past years, we are unable to include a significant number of other biographies because requests for information made to the estates of the deceased have gone unanswered.

Perley Andrews Coffin, 84, died on July 31, 1993. He was a Newburyport native and a 1927 graduate of the high school there. He received the B.S. in Chemical Engineering from Northeastern University in 1931 and the S.M. from M.I.T. in 1933. He then was employed for 45 years by the General Latex and Chemical Corp. in Cambridge. During his professional years he was active in the affairs of the ACS Rubber Division and of the Masonic lodge in Gloucester where he made his home. In the mid 1930's it was my pleasure to meet with Perley and other Newburyporters each noontime for bag lunches and horseshoe meets in an empty lot adjacent to the M.I.T. and General Latex campuses.

George P. Dateo, Jr., 68, died on December 20, 1993. He was a Dedham native who attended the Boston Latin School; before obtaining the B.S. in Chemistry at Harvard and the Ph.D. in organic chemistry at Rice University. Prior to retirement in 1988 he was for many years a research chemist at the U.S. Army Natick Laboratories. He was a much-honored Army veteran of World War II and is buried in the National Cemetery in Bourne, Mass.

Joseph DiTommaso, 76, died on July 11, 1994. He came to the USA as a small boy and served in the Army Air Corps during World War II. After obtaining the B.S. in chemistry and business administration from Northeastern University, he was employed as a

chemist by the Monsanto Co. in Everett for 41 years. He made his home in York Beach, Maine after retirement in 1991.

Harris L. Friedman, 80, died in his home in Londonderry, N.H. on December 1, 1994. *continued on page 9*

Section Archives

M.S. Simon, Section Archivist
20 Somerset Rd., West Newton, MA
02165-2722; (617) 332-5273

In reviewing the NUCLEUS collection the following gaps have been discovered. If you have any of these missing issues and are willing to contribute them to the archives, please contact Dr. Simon. If you have these issues, but do not want to give them up, please let the Archivist know. We will be happy to borrow the issues for copying them and return the originals.

Especially sought are bound volumes of the NUCLEUS. If you have any of those in your possession and are willing to place them in the archives, call Dr. Simon.

Volume	Issue Nr.	Month	Year
1	3	April	1924
3	4	January	1926
4	3	December	1926
35	9	June	1958

Holiday Lecture 1994

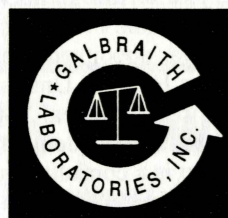
The Northeastern Section and the Museum of Science present the 9th Annual Holiday Lecture at 7:30 p.m. on December 26, 1994 at the Boston Museum of Science, Cahner Theater. *Chemistry and the Toy Shop* is the title of Dr. David Katz's hour of fun. He teaches at Cabrini College in Radnor, PA.

Dr. Katz will also give half-hour lectures about three times a day throughout the week in connection with the museum's exhibit on toys.

No tickets needed. The lecture is free and open to the public. For additional information, call (617) 723-2500. ◇

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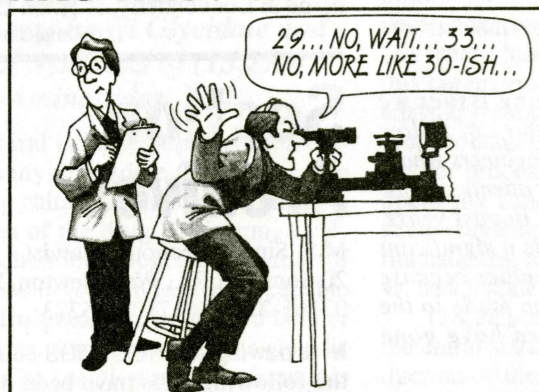
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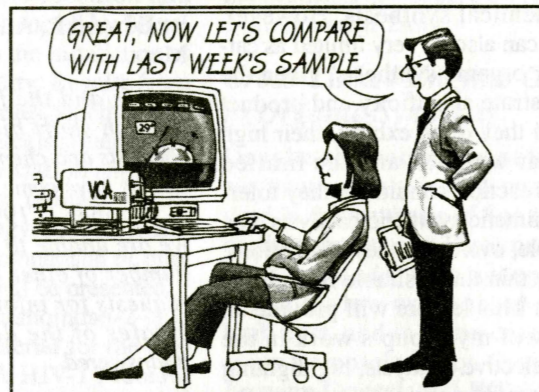
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Historical Notes

continued from page 7

ber 12, 1993. He had moved to the territory of the Northeastern Section in 1985 to be near a daughter, Marilyn Hoffman, the Director of the Currier Gallery of Art in Manchester, N.H.

Friedman received the B.S. (1934) and Ph.D. (1938) from New York University, then was employed as a research chemist by the Pyridium Corp., the Reade Manufacturing Co., and the Galat Chemical Development Co., all in New York. In 1948 he joined the staff of the Lakeside Laboratories in Milwaukee, Wis. and served for 20 years as Vice-President of Research and Development. In 1968 he retired from industry to serve as Professor of Medicinal Chemistry at the Medical College of Wisconsin until retirement in 1985.

He was a Fellow of the AAAS and an active member of many professional societies. For his services to the profession and to the State of Wisconsin he was the 1980 recipient of the Milwaukee Section Award, ACS. His fields of research included heterocyclic compounds, sulfonamides, antihistamines, antispasmodics, and mercurial diuretics. His study of structure-activity relationships led to the concept of bioisosterism that has proved useful in the design of new drugs.

James Alexander Funkhouser, 91, died on March 4, 1994 at his home in Tonganoxie, Kansas. He was a native of Dayton, Ohio who received the B.S. from Carnegie Tech in 1925 and the Ph.D. in organic chemistry from Ohio State in 1930. He then served as Professor of Chemistry at the University of New Hampshire until taking early retirement in 1961. He was well-known in the Northeastern Section. He did not seek to hold office but was usually seen at all Section meetings, accompanied by UNH students whom he transported to Boston along with other members of the UNH chemistry faculty. He served as executive officer of the chemistry department and taught organic chemistry to pre-med students

sent to UNH by the armed forces during the war years. In his spare time he achieved national fame by completely eradicating poison ivy in the town of Durham by copious application of ammonium sulfamate. His professional affiliations include the ACS, AAUP, Sigma Xi, Phi Lambda Upsilon, and Alpha Chi Sigma.

In retirement, Jim moved to a new home in the Agoura region of Southern California and taught organic chemistry at the University of California at Santa Barbara and at the Lutheran College for a few years. After several narrow escapes the Funkhousers finally lost their home to a disastrous fire. After a few years at the side of their swimming pool (which was not consumed), they moved to Kansas to join a son who was an orchestra hornist and conductor. Beginning at age 8 Jim was an accomplished cellist and played until a year before his death with orchestras in Ohio, New Hampshire, Massachusetts, California and Kansas. He was active in the organization of and performance with chamber music groups. With his wife Helen he encouraged young musicians to participate in these activities. One such was the violinist Lorraine Crittendon who later became my wife at a 1944 ceremony in the Funkhouser home in Durham, N.H.

Charles F. Howard, 63, died on October 26, 1993. He was a native of Lynn, Mass. and a 1947 graduate of the Classical High School of Lynn. He obtained the B.S. in Chemical Engineering from Tufts University in 1951 and then was employed by the General Electric Co. in the Steam Turbine Division at Lynn (1951-1955), at Schenectady, N.Y. (1955-1967), and again at Lynn (1967-1987). He was a well-known member of the yacht clubs in Lynn and Saratoga, N.Y. and the North American Champion in the Kestrel Class. He also was a member of the Marblehead Power Squadron.

Mary John Hoye, 84, has died after a long battle with cancer. She was a native of Weston, Mass. who entered the Sisters of Notre Dame in 1932 after receiving the B.S. in Chemistry from Emmanuel College. After brief periods

Member News — Awards

The following are to receive ACS awards:

William P. Jencks, Brandeis University has been selected as the 1995 recipient of the *James Flack Norris Award in Physical Organic Chemistry*, which is sponsored by our Section.

George M. Whitesides, Harvard University, is to receive the *Arthur C. Cope Award*.

Minhaeng Cho, M.I.T. is to receive the Nobel Laureate Signature Award for Graduate Education, **Graham R. Fleming** at the U. of Chicago is his preceptor.

Rick L. Danheiser, M.I.T. and **Barry B. Snider**, Brandeis University, are among the 10 graduate students to receive Arthur C. Cope Scholar Awards.

ACS awards will be presented at the ACS Spring Meeting in Anaheim, CA on April 3, 1995.

Morton Z. Hoffman, Chemistry Department, Boston University, is this year's recipient of the Metcalf Cup and Prize, which is given each year to a faculty member at Boston University for excellence in teaching. Previous Metcalf Awards have been given to two other chemistry professors: Al Prock and John Snyder.

Congratulations to all awardees! ♦

teaching chemistry at academies in Tyngsborough and Boston she joined the chemistry faculty at Emmanuel in 1936 and remained there until 1978. In retirement she held an office in the Sisters of Notre Dame and did volunteer work with the elderly at the Columbia Point project in Dorchester. Sr. Mary John was an accomplished linguist and musician and was a member of C.A.S., NEACT, Sigma Xi, and other professional organizations. ♦

to be continued

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Index of Advertisers

Advanced Surface Technology8
Am. Instrument Exchange11
Am. Polymer Standards Corp.	.....10
Betec Laboratory	.....10
Cambridge Isotope Laboratories	...11
ChemInnovation Software	.....10
Desert Analytics Laboratory	.....10
Galbraith Laboratories	.....6
Jordi Associates, Inc.	.....10
Mass-Vac	.....8
Micron	.....10
Northeastern University	.....2
Oryza Laboratories	.....10
Quantitative Technologies, Inc.	.....11
Scientific Bindery	.....11
Spectral Data Services, Inc.10
Surfaces Research & Apps, Inc.10
Technology Exchange Corp.10

Calendar

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December 1

Prof. Roger Taylor (U. of Sussex, Eng.)
“Addition Reactions of [60] and [70] Fullerenes”
Boston College
Rm. 127, Merkert Chem. Ctr. at 4:00 pm

Prof. Sterling Tomellini (UNH)
“IR Spectroscopic Study of the Interaction of Bile Salts with Model Membrane Systems”
Univ. of New Hampshire
Iddles L103 at 11:00 am

Prof. S. Jansen-Varnum (Temple Univ.)
“Structural Modeling of Humic Acid: The Beginning”
Northeastern University
129 Hurtig Bldg. at 4:00 pm

Prof. Fotios Papadimitrakopoulos (Univ. of Connecticut)
“The Photo-luminescence and Electro-luminescence Quenching in Poly (p-Phenylene Vinylene)”
UMass Lowell
Olney Bldg., Rm. 428 at 3:30 pm

December 5

Prof. Lawrence T. Scott (Boston College)
“Fragments of Fullerenes: Novel Syntheses, Structure, and Reactions”
Boston University
590 Commonwealth Ave.
SCI 107 at 4:00 pm

December 7

Mr. Richard Malikowski (Cranston Print Works Co.)
“Chemical Applications in Textile Printing”
UMass Dartmouth
Rm. 305 Sci. & Eng. Bldg. (Gr. II) at 4:00 pm

December 8

Prof. Charles R. Cantor (Boston Univ.)
“Parallel Processing in Genome Analysis”
Boston College
Rm. 127, Merkert Chem. Ctr. at 4:00 pm

Prof. Ben Widom (Cornell Univ.)
“Diffusion and Drift of Charged Polymers”
Harvard University
Rm. Mb-23 at 4:30 pm

Prof. Paul Inglefield (Clark Univ.)
“Solid State NMR as a Probe of Molecular Dynamics”
University of New Hampshire
Iddles L103 at 11:00 am

December 12

Prof. Antonio Moreira (U. of Maryland)
“Bioprocess Engineering of Biologically Active Proteins”
Tufts University
Rm. 136, STC Bldg., 4 Colby St., Medford, MA at 2:30 pm

Prof. Robert Williams (Colorado State U.)
TBA
Harvard University
12 Oxford St., Rm. Mb-23 at 4:15 pm

December 14

Prof. Akkihebbal Ravishankara (National Oceanic and Atmospheric Administration, Aeronomy Laboratory, Colorado)
“Atmospheric Ozone: What Destroys it and How?”
Harvard University
12 Oxford St., Mb-23 Seminar Room at 4:00 pm

Dr. Evan Kantrowitz (Boston College)
“How Does an Allosteric Enzyme Work?”
UMass Dartmouth
Rm. 305 Sci. & Eng. Bldg. (Gr. II) at 4:00 pm

Notices for the Nucleus Calendar should be sent to:

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