

THE NUCLEUS

May 2000

Vol. LXXVIII, No. 9

Monthly Meeting

*Education Night:
M.Z. Hoffman on the
High School/College Interface*

NESACS Election

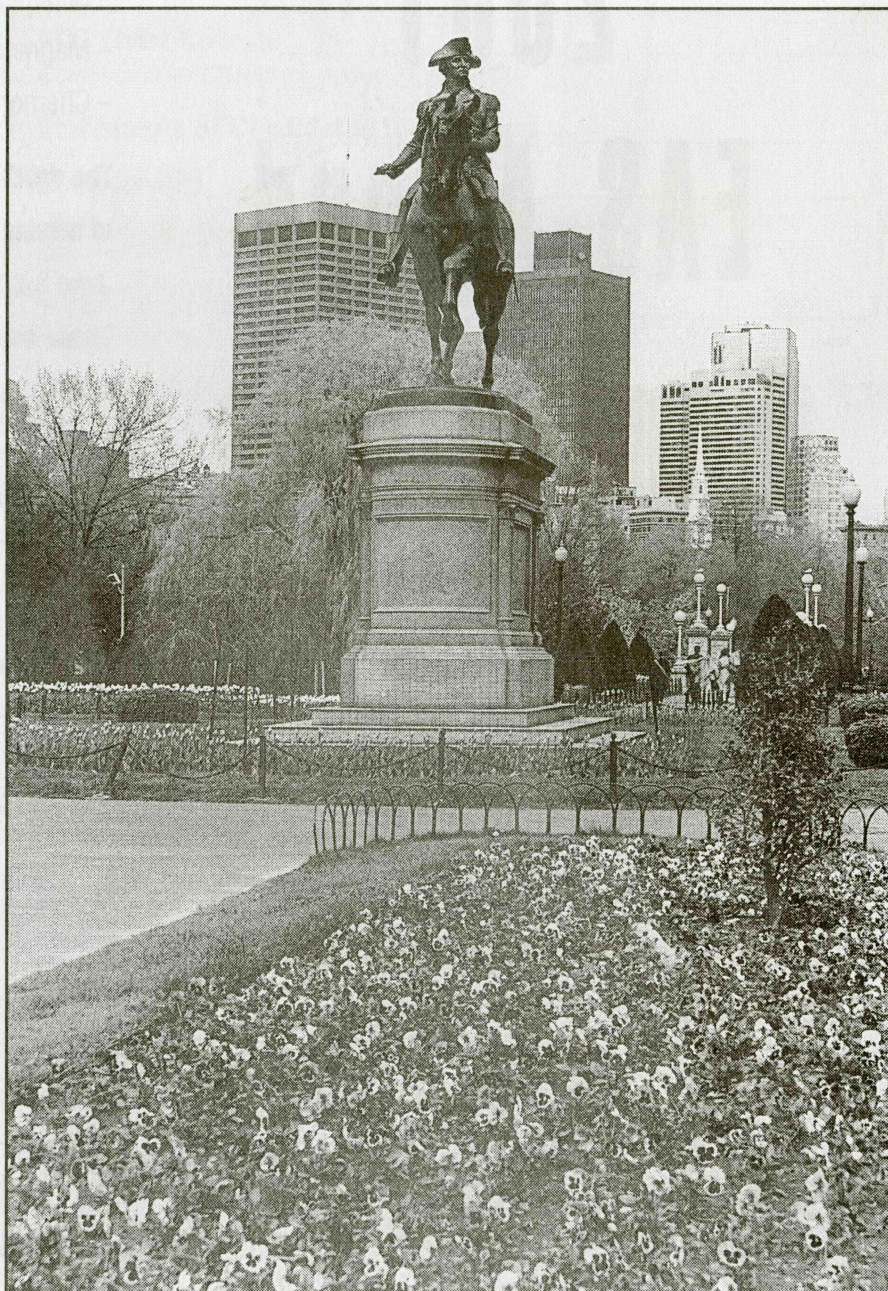
Candidates' Bios and Statements

Book Review

*Protecting Your Ideas by
J.L. Bryant*

Meeting Report

*Wm. A. Pryor's Esselen
Award address*



CALL FOR 2001 EAS Award Nominations

**EAS is soliciting nominees for its
2001 Awards for Outstanding
Achievement in:**

- Fields of Analytical Chemistry
- Near-Infrared Spectroscopy
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- Magnetic Resonance
- Chemometrics

**The deadline for receipt
of nominations is
June 30, 2000.**

**These awards will be
presented at the 2001
Eastern Analytical Symposium, to be
held in Atlantic City, New Jersey.**

A primary letter of recommendation should be submitted by someone familiar with the nominee's work and should be no more than six pages in length. It should include a discussion of his or her work's significance, a list of publications, presentations, and awards, and a statement of the nominee's willingness to present their work at an EAS Award Symposium. Each Award consists of an honorarium, plaque, travel expenses, and the opportunity for the awardee to present his or her work to the attendees at an Award Symposium.

Nomination materials should be addressed to:

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The Northeastern Section of the American Chemical Society, Inc.

Office: Marilou Cashman, 23 Cottage St., Natick, MA 01760. 1-800-872-2054 (Voice or FAX) or 508-653-6329. e-mail: mcash0953@aol.com
Any Section business may be conducted via the business office above.
NESACS Homepage: <http://people.ne.mediaone.net/obermayer/nesacs>
Washington, D.C. ACS Hotline: 1-800-227-5558

Officers 2000

Chair:

Doris Lewis
Chemistry Dept., Suffolk University
41 Temple St., Boston, MA 02114
617-573-8546; fax: 617-573-8668
e-mail: dlewis@cas.suffolk.edu

Chair-Elect:

Timothy B. Frigo
Advanced Magnetics, Inc.
61 Mooney St., Cambridge, MA 02138
617-497-2070;
e-mail: tfrigo@hotmail.com

Immediate Past Chair:

Donald O. Rickter
88 Hemlock St., Arlington, MA 02474-2157
781-643-7575
e-mail: 72133.3015@compuserve.com

Secretary:

Michael Singer
ArQule, Inc.
19 Presidential Way
Woburn, MA 01801
781-994-0523; fax: 781-994-0677
e-mail: msinger@arqule.com

Treasurer:

James Piper
Simmons College, 300 The Fenway
Boston, MA 02115, 617-521-2722

Auditor:

Anthony Rosner

Archivist:

Myron Simon
20 Somerset Rd.
Newton, MA 02465; 617-332-5273
romysimon@mindspring.com

Trustees:

Joseph A. Lima, Esther A.H. Hopkins
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Stephen Lantos
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Term ends 12/31/2001

Michael P. Filosa
Morton Z. Hoffman
Donald O. Rickter
Sophia R. Su

Term ends 12/31/2002

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Any Councilor of the American Chemical Society residing within the section area is an ex officio member of the Board of Directors.



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At UConn, June 18-21, 2000

Cover: *Washington Monument in the Boston Public Garden (photo: M. Simon)*

Deadlines: *Summer Issue: June 9, 2000*

September Issue: July 21, 2000

THE NUCLEUS

The Nucleus is distributed to the members of the Northeastern Section of the American Chemical Society, to the secretaries of the Local Sections, and to editors of all local A.C.S. Section publications. Forms close for advertising on the 1st of the month of the preceding issue. Text must be received by the editor six weeks before the date of issue.

Editor:

Arno Heyn, 21 Alexander Rd., Newton, MA 02461.
Tel: 617-969-5712, FAX: 617-527-2032; e-mail: aheyne1@juno.com

Associate Editor:

Myron S. Simon, 20 Somerset Rd., W. Newton, MA 02465, Tel: 617-332-5273

Board of Publications:

E. Joseph Billo (Chair), Marietta H. Schwartz, Patrick M. Gordon

Business Manager:

Karen Piper, 19 Mill Rd., Harvard, MA 01451,
Tel: 978-456-8622

Advertising Manager:

Vincent J. Gale, P.O. Box 1150, Marshfield, MA 02050,
Tel: 781-837-0424; FAX: 781-837-8792

Contributing Editors:

Patricia Hamm, Features; Edward Atkinson, History of Chemistry, Maryann Solstad, Health; Catherine E. Costello, Calendar; Dennis Sardella, Book Reviews, Marietta H. Schwartz, Software Reviews, E. Joseph Billo, Puzzles.

Proofreaders:

E. Joseph Billo, Donald O. Rickter, M.S. Simon

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Board of Directors

Notes of Meeting of February 10, 2000

NOTE: Board Meetings are held on the monthly meeting day at 4:30 p.m. Section members are invited to attend.

Officers' Reports:

Chair: D. Lewis reported that discussions are under way with the Boston Museum of Science concerning a possible chemistry internship. More under Old Business. The "Science is Fun" demo has been scheduled for April 30 at MIT and is being coordinated by P. Brauner (See announcements in the April and May issues of *The NUCLEUS*). A digital camera has been purchased so that photos of meetings and other NESACS events can be available for publication, publicity and the website.

NESACS will be fully represented at the Council Meeting in San Francisco. She congratulated M. Singer on his upcoming wedding.

Chair-Elect: T. Frigo stated that because of weather-related flight cancellations one of the two scheduled speakers for tonight, K. Dougherty from the national ACS office was unable to come, but that Congressman Capuano will join State Senator Maggiani to speak on Science Policy issues. He reminded members that the March Richards Award Meeting at Harvard will be on March 16, 2000 the **third** Thursday.

Treasurer: J. Piper presented the January report. After some clarification of details it was **MOVED** and **VOTED** to accept the report.

Archivist: M. Simon pointed out that pictures of T.W. Richards from the Harvard Archives have been published in the March issue of *The NUCLEUS* as a center spread.

Standing Committees:

Bd. Of Publications: J. Billo reported that *The NUCLEUS* is in good financial health: In 1999 244 pages have

been published (8 more than budgeted), total expenses were \$57,400 (\$4,300 under budget), ad revenue was \$51,400 (\$13,600 over budget) and the net cost to the Section (after transfer of charges for the Norris Award issue and election/ballot expenses) was \$750 (\$12,750 under budget). He also stated that the rather high receivables balance has decreased significantly.

As a result of the offer for members to receive free copies of the directory, a few requests had been received from members in the Central MA Section, and it was decided that only requests from NESACS members will be honored.

Editor: A. Heyn stated that the March issue is completed and is 24 pages.

Nominating: D. Rickter presented the slate of nominees for the several positions, which will also be presented at tonight's Section Meeting. (See list on page 15 of the March *NUCLEUS* and the material in this May issue, ed.). D. Rickter was asked why some of the positions had only one nominee. He stated that several members had been asked to run, but late refusals left only one candidate for Chair-Elect.

Chemistry Education: M. Hoffman presented the report for R. Tanner who was unable to attend: Information about Norris/Richards Summer Research Scholarships has been distributed to Departments. The Chemistry Olympiad try-outs are being held at Simmons College and will be coordinated by Steve Lantos.

Professional Relations: T. Light reported for P. Hamm who is making a presentation at the YCC meeting which is meeting at the same time as this Board meeting. On February 26, 2000 the "Effective Job Search Strategy" workshop will be offered at Northeastern University free of charge, but so far, pre-enrollment has been below expectations. P. Hamm will be making a presentation to the National ACS on new programs.

Local Arrangements: W. Gleekman reported the following arrangements for upcoming meetings: March 16 (Richards Award Meeting): Dinner at the Harvard Faculty Club, Award

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Shakhashiri Lecture

Sunday April 30, 2000

M.I.T., Room 10-250 3p.m.

Dr. Bassam Shakhashiri once again proves that science is fun for everyone from kindergartners to The Greatest Generation.

This popular, exciting presentation is free and open to all. Simply arrive – no reservations required.

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For more information, contact: Dr. Phyllis Brauner at 781-235-7849 ◇

CHICKENS AND EGGS

Membership surveys show that you want more articles in the Nucleus. If you tell our advertisers that you saw their ad in the Nucleus, they will provide more financial support and this will allow us to add articles.

Monthly Meeting

The 816th Meeting of the Northeastern Section of the American Chemical Society

Education Night

Thursday, May 11, 2000

Executive Dining Room, School of Management,
Boston University, 595 Commonwealth Ave.

5:30 Social Hour, a table of Career Services literature and aids will be available

6:30 Dinner

7:45 Evening Meeting, Dr. Doris Lewis, Chair, presiding

Address: *Exploring the High School/College Interface*

Prof. Morton Z. Hoffman, Boston University

Presentation of Awards

Philip L. Levins Memorial Prize

James Flack Norris/Theodore William Richards

Undergraduate Research Fellowships

Undergraduate Grants-in-Aid

Undergraduate Research Symposium

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Induction of New Members into *Aula Laudis*

Avery A. Ashdown Chemistry Examination

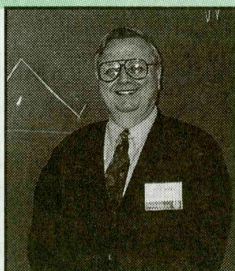
Simmons College Prize

Dinner reservations should be made no later than noon, May 4. Please call or fax Marilou Cashman at (800) 872-2054 or e-mail at MCash0953@aol.com. 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.

Parking: Recommendation: **Use the T!** Meter on-street parking available (exam period, no Red Sox home game!). Limited spaces available in the School of Management garage – bring ticket for reimbursement.

Watch for Summerthing, to be announced in the Summer Issue



Abstract

The high school and college students who will be honored at this NESACS Education Meeting represent the two ends of a transport process across the high school/college chemistry interface, which separates two highly immiscible phases. It is hoped that this talk will be able to inject a small amount of emulsifying agent into the system so as to encourage the individuals that make up the two phases to interact more closely with one another. The potential accomplishments of chemical education would be greatly enhanced if teachers on both sides of the interface knew what the other was doing, respected the challenges each face, and worked toward the common goal of encouraging the learning of chemistry ◇

gram Committee of the Division of Chemical Education.

The author of almost 200 publications in the chemical literature, his research interests have been in the area of the photochemistry and photophysics of transition metal coordination complexes, photochemical storage and conversion of solar energy, the photochemistry of environmental systems, and the application of fast kinetics techniques; he is now focusing his attention to issues in chemical education.

He held a Senior Postdoctoral Research Associateship from the U.S. National Academy of Sciences, and is a Fellow of the American Association for the Advancement of Science. He was awarded the 1994 Metcalf Cup and Prize for Excellence in Teaching from Boston University, and received the Henry A. Hill Award for Outstanding Service from NESACS in 1999. ◇

Correction

On the cover of the April issue the author of the reviewed book *Chemical Creativity* should be J.A. Berson, not Berman. Our apologies for this error. ◇

Biography

Morton Z. Hoffman is a native of New York City, where he attended the Bronx High School of Science. He received an A.B. degree from CUNY-Hunter College (1955), a M.S. from The University of Michigan (1957), and a Ph.D. from Michigan (1960) in physical chemistry under the direction of Professor Richard B. Bernstein. He was a postdoctoral research associate (1960-61) with Professor George Porter at Sheffield University, England, where he applied

flash photolysis to the study of the nonradiative decay of aromatic triplet states.

Since 1961 he has been on the faculty of Boston University where he is Professor of Chemistry; he has served as Associate Chairman of the Chemistry Department and the Director of Undergraduate Studies, and as Director of the Center for Teaching Excellence within the College of Arts and Sciences. He is an Associate Councilor of NESACS and past-Chair of its Chemistry Education Committee, a member of the SOCED Task Force on Undergraduate Programming at National ACS Meetings, and Chair of the Pro-

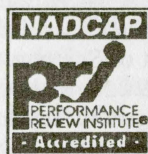
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Board of Directors

continued from page 4

Meeting in the Science Center at 8:15. April 13 Meeting (Esselen Award Meeting): same arrangement as for March. May 11 meeting (Education night): At the B.U. School of Management building, 595 Commonwealth Ave. in the Executive Dining Room.

Other Committees:

Continuing Education: A. Viola stated that on May 11th and 12th the ACS Short Course on Combinatorial Chemistry will be presented.

Younger Chemists: Currently meeting at the same time as this Director's meeting with a presentation by P. Hamm about career development.

Corporate Affiliates: M. Strem reported that in the future, fund-raising will be done jointly with the Medicinal Chemistry Group so that the same donors are approached only once.

NERM 2000: D. Lewis stated that the meeting will be June 18-21 at UConn in Storrs, Ct. with 20 symposia and technical sessions scheduled. NERM 2001 will be hosted by NESACS at the University of New Hampshire in Durham. Howard Maine from UNH has requested that a NESACS board member help coordinating activities with UNH. She asked for volunteers to contact her.

Old Business:

2000 Budget: It was MOVED and voted that the budget, as previously presented by J. Piper be APPROVED.

Museum of Science Internship: Presented by D. Lewis and P. Gordon: The feasibility of a chemistry internship in memory of Janet Perkins is being discussed. The Museum is able to give advice on soliciting funds and is able to assist with the selection of interns. The Board has to decide whether to support this effort. Open issues are: Who will announce the internship, what can be done to make this attractive for corporate sponsors, how and who will do the fundraising, what will be the name of the internship, and who will be the on-site chemistry mentor.

It was pointed out that such an internship would offer the following

Section News

Suffolk University Student Affiliate Chapter Honored

The Student Affiliate (SA) Chapter at Suffolk University, Boston, MA has received *Honorable Mention* for its 1998/99 activities.

Suffolk University has about 25 chemistry majors. Doris Lewis is both the Department Chair and the Faculty Advisor to the chapter. One event which the SA chapter participated in is Suffolk University's Cultural Diversity Week where they sponsored a pot-luck lunch. This event promotes camaraderie by offering a variety of cuisines and international music. Participation of the SA chapter helps to influence other students toward realizing the merits of being a chemistry major.

From ACS Director Michael Strem's Region I Newsletter of February 2000 ♦

advantages to NESACS: A real chemistry presence at the Museum, establishing finally a real partnership with the Museum of Science after a long hiatus, having the intern make a presentation at a Section meeting.

The Museum requested a start-up fund of \$3,000. It was MOVED and VOTED to obtain more definite information before committing funds.

New Business:

Alternate Councilor Vacancy:

D. Lewis announced that Andre Rosowsky had resigned as Alternate Councilor. Being next in line from last year's slate, it was MOVED and VOTED to elect Truman Light as Alternate Councilor for the term ending December 31, 2000.

National Meetings: M. Hoffman, reporting for T. Gilbert, announced that the 2002 National ACS Meeting will be in Boston on August 18-23, 2002. NESACS will be the hosting Section and a committee will have to be organized.

From the minutes of M. Singer ♦

Learn more about one of today's hottest topics in the fields of Biotechnology,
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National ACS is making top-rated ACS Short Courses available to local sections at tuition fees greatly reduced from the normal \$845 charged at National Meetings. The NESACS Committee on Continuing Education is pleased to present these continuously updated courses, which have been successfully presented at ACS National Meetings.

DATES and TIME: Thursday, May 11, 2000, 8:00 a.m. – 5:00 p.m.
and Friday, May 12, 2000, 8:30 a.m. – 5:00 p.m.

PLACE: Snell Library, Room 90, Northeastern University, 360 Huntington Ave., Boston, MA

PROGRAM AGENDA:

- *Introduction to Combinatorial Chemistry*
- *Challenges of Combinatorial Chemistry*
- *Resins and Linkers for Solid Phase Synthesis*
- *Encoding Techniques for Synthesis*
- *Building Virtual Libraries*
- *Instrumentation for Parallel Synthesis*
- *Combinatorial Chemistry Applications Using Solid and Solution Phase Chemistry*
- *Techniques and Methods to Tackle Synthetic Problems and Plan Library Synthesis*
- *Solution Phase Synthesis*
- *Scavenger Resins*

INSTRUCTORS:

Dr. Aubrey Mendonca, the Director of Marketing and Product Manager at IRORI., was previously involved in the development and production of cancer vaccines while at Biomira, after which he was the Director for Novabiochem in San Diego, where he helped develop the combinatorial catalog for solid and solution phase synthesis.

Dr. Michael Organ, founder and director of the Combinatorial Chemistry Facility at York University in Toronto, Canada, has focused on synthetic efficiency and the application of tandem-reaction methodology. Initially targeted carbon-carbon bond forming methods have now been expanded to carbon-heteroatom bond formation. There are ongoing collaborative research efforts with a number of pharmaceutical and instrumentation companies.

PRE-REGISTRATION REQUIRED – Registration Fees:

ACS Members if received before April 26.....\$325.00; after April 26\$375.00

Non-ACS Members if received before April 26.....\$425.00; after April 26\$475.00

There will be a limited number of scholarships for unemployed ACS Members on a space-available basis.

Parking Fee \$7.00/day

University cafeterias will be available for lunches.

For further information contact: Prof. Alfred Viola – (617) 373 2809

Registration form for Short Course: *Combinatorial Chemistry: Solid and Solution Phase Synthesis*

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Prof. Alfred Viola, Chair
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Northeastern Section

Election of Candidates for 2000

In the interest of providing maximum information and expression of opinion by the candidates for election in 2000, the Nominating Committee has prepared this section of the NUCLEUS for mailing concurrently with the ballots. All candidates were asked to submit biographical material and, with the exception of committee member nominees, position statements. To attain uniformity of format, the biographical data have been rearranged, and, where the text exceeded the allotted space, abbreviated. The statements have been reproduced without change. An official ballot, along with a ballot envelope and return envelope have been provided. The election and balloting are being carried out in conformance with Article VIII of the Constitution of the Northeastern Section. The order of candidates for each office on the ballot has been determined by lot. Comments regarding the election may be addressed to the Nominating Committee Chair, Dr. Donald Rickter (address on p.3)

BALLOT DIRECTIONS: Vote for the candidate(s) of your choice, insert your ballot into the ballot envelope. (Neither the ballot nor ballot envelope may have any writing or identification). Insert the sealed ballot envelope into the return envelope and sign your name on the return envelope only, affix postage and mail.

The ballot must be received by June 1, 2000. ◇

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Chair-Elect

(Three-year sequence: Chair-Elect, Chair, Past Chair)

Morton Z. Hoffman

Professor of Chemistry,
Boston University, Boston, MA 02215.

Education: A.B., CUNY-Hunter College (1955); M.S., University of Michigan (1957); Ph.D., University of Michigan (1960).

Professional Experience: Boston University: Assistant Professor (1961-67), Associate Professor (1967-71), Professor (1971-present). Postdoctoral Research Associate, Sheffield University, England (1960-61); Visiting Scientist, U.S. Army Natick Laboratories (1969-74); Acting Associate Dean, College of Arts and Sciences, Boston University (1983-84); Associate Editor, *Radiation Research* (1985-89); Associate Chairman and Director of Undergraduate Programs, Department of Chemistry, Boston University (1989-94); Director, Center for Teaching Excellence, Boston University (1994-1997).

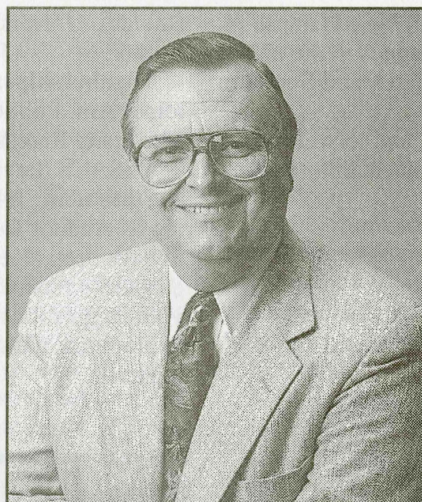
Memberships, Honors: ACS Member since 1955 (PHYS, INOR, ENVR, and CHED Divisions); HAAS; New York Academy of Sciences; NEACT, Sigma Xi, Phi Beta Kappa (1955); Senior Postdoctoral Research Associate, U.S. National

Academy of Sciences (1969-70); Associate of the Danforth Foundation (1970); Fellow of the American Association for the Advancement of Science (1992); Metcalf Cup and Prize for Excellence in Teaching at Boston University (1994); Henry A. Hill Award for Outstanding Service, Northeastern Section, American Chemical Society.

Research Area and Interests: Physical-Inorganic Chemistry; photochemistry and photophysics of coordination complexes, fast kinetics techniques, issues in chemical education.

ACS Service: Member, CHED Program Committee (1980-86); Member SOCED Task Force on Undergraduate Programming (1991-present); Consultant, President's Task Force on International Education (1992); Member, CHED Program Committee (1992-present); Member, CHED International Activities Committee (1993-present); Member, College Chemistry Consultants Service (1995-present); Meeting Chair, CHED, Orlando National Meeting (August 1996); Chair, SOCED Undergraduate Program, Las Vegas National Meeting (September 1997); Member, CHED Task Force on Regional meetings (1998-present); Program Chair, CHED (2000-02)

NESACS Service: Member and Chairman, Speakers Bureau (1964-73); Member, Board of Directors (1993-present); Chair, Education Committee (1993-1996); Chair, College Subcommittee, Education Committee (1997-present); Member, Nominating Committee (1994); Speaker, February



1995 Monthly Meeting; Organizer, NESACS Undergraduate Day (1992-present); Organizer, NESACS Undergraduate Research Symposium (1993-1998); Member, Centennial Committee (1997-99); Alternate Councilor (1994-1997, 1999-present); Councilor (1997-98); Member, Advisory Board, NESACS Graduate/Undergraduate Chemistry Research Conference (1999-present).

Statement: I am honored to have been nominated for the position of Chair-Elect of the Northeastern Section. I am particularly looking forward to the opportunity to plan the monthly meetings of the Section during 2001 with the hope that a roster of

interesting and provocative speakers will continue to attract attendees and provide new insights into research, education, and the public understanding of chemistry.

As Chair of the Section, I will make sure that our active career and continuing education programs are maintained, and that The NUCLEUS remains our outstanding flagship publication. I will work to continue the vitality of the section's infrastructure, and encourage our joint activities with other local chemistry organizations. At the same time, I am aware that the Northeastern Section is unusual in that it contains more academic institutions within its borders than does any other local section. In effect, chemical education is one of this Section's most important industries, occupying a substantial fraction of its membership and having a significant economic impact. I will strive to develop further those programs that transmit the excitement of science and chemistry to young people, who are the future of our profession and our Society, and that recognize the achievements of our many undergraduate and graduate students in the chemical sciences. In particular, I would like to see the Student Affiliates chapters of our institutions exhibit unprecedented activity.

With all its colleges and universities, chemical companies, and government facilities, the Northeastern Section is very rich in human resources, having more than 5,000 members. One of my goals will be to encourage the membership to reach out to those who might benefit from our expertise, networking, and friendship. In particular, I would like to see our new NESACS Younger Chemists Committee grow stronger with the inclusion of more graduate and undergraduate students, post-doctorals, and chemists in the early years of their careers. I would like to see a greater bond develop between the teachers on both sides of the high school/college interface. I would like our Section to continue to be a determined advocate for enlightened governmental science policy, and a resource for clear science reporting in the media. Because our Section is geographically relatively compact, I would like to have our activities take place

continued on page 10

broadly across Eastern Massachusetts and New Hampshire, and link when appropriate with our colleagues in the neighboring Central Massachusetts, Rhode Island, and Southern Maine Sections.

I look forward to serving the Section, and to welcoming its members to join me as active participants in this venture.

Treasurer

(Two year term)

James U. Piper

Education: B.S. MIT; M.S., Ph.D. Emory University.

Professional Experience: Research appointments at Yale U. 1963-6, MIT 1966-7 and 72-3, Worcester Foundation for Experimental Biology 1979-80. Teaching appointments at New Haven College 1963-6, Simmons College 1966-present.

NESACS Service: Treasurer Sept. 1977-present.

Statement: The Treasurer chairs the Budget Committee, is responsible for all Section funds except those of the Trust Accounts, and prepares reports for the Board of Directors, National ACS, and state and federal agencies. The Section currently operates with a budget of \$234,000 of which 40% comes from Trust Funds and 30% from local and national dues. About 30% of all expenditures are related to awards which recognize achievements in chemistry at all levels, from high school students to professional chemists. This also includes programs that encourage young people to enter the profession. Administrative expenses constitute 15% of expenditures. The remaining 55% is used for services to the membership such as the NUCLEUS, monthly meetings, continuing education programs and workshops, professional relations activities including employment services, and public relations activities such as National Chemistry Week. The quality of these programs is high, and the major budgetary problems involve setting priorities among them. I am pleased to work with the Board of Directors who volunteer many hours in the service of their profession.

Auditor

(Two-year term)

Anthony L. Rosner

Education: B.S. Chemistry, Haverford College, Pa., Ph.D. (Biological Chemistry/ Medical Science), Harvard University (1972)

Professional Experience: (Last 10 years): Foundation for Chiropractic Education and Research, Arlington, Va. and Brookline, Mass. (1992-); Director of Research and Education; Children's Hospital, Boston, Mass., Joint Program in Neonatology (1991-92); Research Operations Manager;

Brandeis University, Dept. of Chemistry (1986-91); Administrator.

Memberships: ACS (1965-); numerous societies in medicine, Am. Public Health Assoc. (1992-); Natl. Council of University Research Administrators(1993-)

NESACS Service: Auditor (1989-)

Statement: It has been a pleasure to have been performing as Auditor for the Northeastern Section of the ACS and to have been able to document the continuing growth of the economic robustness of the Society for over a decade. With your suggestions and support, I look forward to being able to providing a fastidious and continuing service for the coming term.

Trustee

(Three-year term)

Joseph A. Lima

Vice President, Houghton Chemical Corporation.

Education: B.S. in Chemistry from UMass and an MBA from Babson College.

Memberships: ACS member since joining as a Student Affiliate. A member of the Division of Chemical Marketing and Economics.

NESACS Service: Northeastern Section Board of Publications (1994-1998; Chair 1996); Nominating Committee (1996); Northeastern Section Board of Trustees (1998-present)

Statement: Our Section is fortunate to be able to fund many useful endeavors from our trusts. Effective oversight and management of these investments is a vital activity which I take seriously. I would appreciate your vote of confidence in returning me to another term as a trustee.

Councilor/Alternate Councilor

(Three-year terms; four Councilors and four Alternate Councilors to be elected)

Catherine E. Costello

Education: AB degree (chemistry) from Emmanuel College; MS and PhD degrees (organic chemistry) from Georgetown University.

Professional Experience: Boston Univ. School of Medicine, Prof. of Biochemistry and Biophysics and Director of the BUSM Mass Spectrometry Resource (1995-); Associate Director of the MIT MS Resource (1975-1995).

ACS Service: Constitution and Bylaws Comm. (1994-99); member of the International Activities Committee. She has completed many tours for the ACS Speakers Bureau.

NESACS Service: Councilor for the Northeastern Section (1989-present; Alt., 1986-8); Constitution and Bylaws (C&B) Committee, Chair; Calendar Coordinator for The

NUCLEUS; member, Publications Committee (1988-1993) and its chair (1990, 1993); four terms on the Nominating Committee.

Memberships: ACS, ASMS, AAAS and the Society for Glycobiology and serves on NIH review panels and several editorial and advisory boards.

Statement: I wish to continue to serve as a Councilor for the Northeastern Section in order to bring the interests of our members to the attention of the National ACS, to provide input to national policies based on my experience with educational institutions, research funding programs and national and international exchange of scientists and information, and to increase access of our members to the wide resources available to support their work and careers. Although our research often straddles a wide range of activities, it is important that the ACS remain a central feature in our professional lives and in those of our students. I would like to foster more collaborations among academic institutions and between academia and industry and to encourage interdisciplinary research and training.

Wallace J. Gleekman

Education B.S., Bridgewater State College; Ed.M., Boston University; Ph.D., Walden University.

Professional Experience: Chemistry Teacher (retired), Brookline High School; currently Instructional Support Staff, Newton Oak Hill Middle School.

ACS Service: NESACS Councilor, 1984-89; Alt. Councilor 1990-95; Task Force on Chemical Education; Task Force on Local Section Activities; National Tour Speakers Bureau.

NESACS Service: Chair, Chemistry Education Committee; Chair, Local Arrangements Committee; Chair, NESACS 1981

Honors: Lyman C. Newell Award; Northeastern United States Chemistry Teachers Award; James B. Conant National Award; John A. Timm Award; Massachusetts Presidential Nominee; Norfolk County Honors Award; Massachusetts Teachers Association Award; NESACS: Henry A. Hill Award; Theodore William Richards Award for Excellence in Teaching of Secondary School Chemistry; Aula Laudis.

Statement: It would be a distinct honor, privilege and pleasure to serve again on the Board of Directors representing you in the actions and activities of our Northeastern Section on both the local and national levels. One of your votes in this election would be appreciated.

Iclal S. Hartman

Education: A.B., M.A. Mount Holyoke (organic chemistry); Ph.D. (biochemistry-cancer research), University of Florida.

Professional Experience: On the faculty of the chemistry department, Simmons College, Boston

NESACS Service: Professional Relations Committee,

Membership Committee, chair 1990-99; Esselen Award Committee, 1998-2001; chair, 2000.

Arno H.A. Heyn

Education: B.S., Ph.D., Univ. of Michigan (analyt. chemistry).

Professional Experience: Boston University (Instructor to Professor, 1947-84); Prof. emer. (1984); visiting scientist appointments at Brookhaven Laboratory (summers 1954-56); Eidgen. Techn. Hochschule (Zurich, 1965); Kernforschungszentrum Karlsruhe (1973, 1980, summers 1981, 1982, 1986).

ACS Service: 50-year member; Councilor (1967-1997); Alt. Councilor (1998-2000); Elected ACS Committees: Comm. On Committees (1992-94); Council Policy Comm. (1986-91, vice-chairman 1987-88). Council Committees: Local Section Activities (Associate, 8/1996-1997). Const. And Bylaws (1980-85, chairman 1983-85); Membership Affairs (1968-72, 1973-79, secretary 1970-72, 1973-79). Canvassing Committee for ACS Inorg. Chemistry Award (approx. 1985)

NESACS Service: Currently: Editor of The NUCLEUS (7/1989-); Const. and Bylaws Comm.; Esselen Award Committee (2000-2003); Awards Committee (chair 1996-1997); Nominating Committee several times, last: 1996; Chairman sequence (1967-69); Treasurer (1959-62); Member and chairman of numerous committees in the past.

Award: Henry A. Hill Award for Distinguished Service to the Northeastern Section, 1986.

Statement: As Councilor I hope to represent your interests, and those of the Northeastern Section. In particular, I would strive to promote interaction of ACS Headquarters with local members by increased communication, both in print and via the internet to spread knowledge about programs and aids the national ACS has available. I also hope to be active in programs for helping to improve the public image of chemistry.

Esther A. H. Hopkins

I am seeking reelection to the position of Councilor for the Section. In the past, in that position I have brought the voice and the concerns of this Section not only to the Council in general, but also to the committees, commissions and task forces of the Council. I have served on the Committee on Constitution and Bylaws as member and secretary, as member and then chair of the Committee on Professional Relations, as member and secretary on the Committee on Committees, the Committee on Nominations and Elections and the Council Policy Committee. I am currently a member of the Committee on Environmental Improvement. I have headed the Task Force on Ethics and been a member and secretary of the Women Chemists Committee. I have also been active in our local Section, having been Program Chair, Section Chair, Trustee and member of the Public Service Committee, the Awards Committee and the Profes-

sional Relations Committee. I have been honored with the Henry Hill Award for Outstanding Service.

Professionally, I have taught at the college level, run a laboratory at the New England Institute for Medical Research, and at a small pharmaceutical company, worked as a scientist, patent attorney and manager at Polaroid Corporation, and as a Deputy General Counsel at the Massachusetts Department of Environmental Protection. My research doctorate is in biophysical chemistry from Yale and my professional doctorate is in law from Suffolk.

My background is varied, and my interests are broad. I would like to bring that background and those interests to the service of the Section for this next term. The Council of the Society is the place where the members have an opportunity to participate in the direction of this large professional organization. An experienced Councilor adds depth and richness to the input of a local group. As the Society moves ahead, I would like to be a bridge to enable our Section to be in the forefront of the advances that chemists and chemistry make in the future. May I have your vote to continue to be a part?

William Klemperer

Education: A.B. Harvard University, 1950; Ph.D. Univ. of California, Berkeley, 1954 (with Prof. Pimentel)

Professional Experience: Instructor to Professor (from 1965), Harvard University 1954-; Visiting Scientist, Bell Laboratories, Murray Hill, NJ 1963-83; Asst. Director, National Science Foundation (for mathematical and physical sciences) 1979-81.

Membership and Honors: ACS, American Physical Society, American Academy of Arts and Sciences, National Academy of Arts and Sciences

Awards: Several Awards, including the Irving Langmuir Award (ACS, 1980); Peter Debye Award in Physical Chemistry (ACS, 1994); Faraday Medal and Lectureship (The Royal Society of Chemistry, London, 1995); D.Sc. (University of Chicago, 1996)

Statement: There are many activities that the American Chemical Society can expand to ensure interest in the science of chemistry. For example, advances in chemistry are presently seriously underrepresented in the all too thin science sections of the public media. However, the primary role of the American Chemical Society must be that of serving the needs of the profession. Increasingly this is communications based. While technical journals together with meetings have been the major underpinning, and must be steadily strengthened, our chemical society should lead in developing and extending innovative interactive electronic communication. Such an investment will benefit the practicing chemist as well as aiding in the education of the future chemists. Since the health of our profession depends upon continuously attracting the brightest original minds, educational and outreach programs are important.

Truman S. Light

Education: Harvard University, S.B. (1944); University of Minnesota, M.S. (1949) University of Rome (Italy), Doctor of Chemistry (1961).

Professional Experience: Boston College, Assistant Professor (1949-1959); Avco R&D, Sr. Scientist, Manager of Analytical Laboratory (1959-64); The Foxboro Co., Principal Research Scientist (1964-88); Consultant in Instrumentation (1988-present); Adjunct Professor, Chemical Instrumentation, Suffolk University (1992), Aquinas College, Newton (1994-5), Boston College (1987, 1999)

Awards: National Science Foundation Science Faculty Fellowship, 1959-61 (Rome), Henry Hill Award for Service to Northeastern Section (with Arlene Light), 1993; Waters Symposium Award (Ion Selective Electrodes), Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, (1996).

ACS Service: Councilor (1976-1995); Alternate Councilor (1996-1999); National Committee memberships: Local Section Affairs, Constitution and Bylaws, Membership Affairs, Employment Services Advisory Board, Copyrights.

NESACS Service: Section Chairman (1978); Councilor (1976-1995); Alternate Councilor (1996-1999); member and chairman of various Committees: Student Affiliate; Constitution and Bylaws; Esselen Award; Professional Service, Employment Services.

Statement: I am a candidate for Councilor because I would like to continue to serve the Northeastern Section in the liaison capacity between the Local Section and the national ACS. In addition to the offices listed above, I have helped create a link between the National and Local Section Employment Services which I have co-chaired. Ten years ago, I suggested that local section volunteers could better replace the paid temporary staff recruited to aid in the registration of thousands of candidates at the National Employment Clearing House. This has been successfully in effect at all National Meetings since 1991. Also, since 1991, I have attended National Meetings twice a year, by virtue of being a Councilor or Alternate Councilor, and thereby simultaneously working at the National Employment Clearing House (NECH), registering candidates and more recently being in charge of the Resource Library part of the NECH. I need to be a Councilor to be able to continue this work at the national level.

I seek your vote for Councilor to be able to continue my involvement in several of the facets of national ACS and thereby link them with the NESACS.

Howard Mayne

Received his B.Sc, M.Sc., and Ph. D degrees from the University of Manchester, England, and did postdoctoral work in Germany and Canada before moving to the University of New Hampshire, where he is currently Professor and

Chair. He was co-chair of the recent ACS National Historic Chemical Landmark event at UNH, the first such honor bestowed in New England. He is also General Chair of the ACS NERM 2001, to be held at UNH in June 2001. If elected, he will try to make the New Hampshire member schools of NESACS more instrumental in decision making.

Dorothy J. Phillips

Education: B. A. Chemistry, Vanderbilt University, and Ph. D. Biochemistry, University of Cincinnati

Professional Experience: Director, Strategic Program Management in the Chromatography Chemistry Division, Waters Corporation, Milford, MA

1984-Present, Waters Corporation, involved in the development, application and marketing of new chromatography columns and sorbents; 1974-84, fermentation and animal nutrition research at Dow Chemical Company, Midland, MI.

Recent Honors: 1985-Present, selected to present papers at national and international scientific meetings; 1994 McMickens College of Arts and Science, and 1993 Friends of Women Studies, University of Cincinnati Distinguished Alumnae; 1991 Member of Citizen Ambassadors Program's Industrial Biochemical Delegation to the People's Republic of China.

Memberships: American Chemical Society, National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCHE), Sigma Xi, American Association of Pharmaceutical Scientists and Alpha Kappa Alpha Sorority, Inc.

ACS Service: NESACS Councilor 1995-2000

NESACS Service: Co-Chair of Northeastern Section Centennial Celebration Committee, 1997-98; Councilor, 1994-2000; Chair of Nominating Committee, 1994; Chair of Section, 1993, Chair-Elect, 1992; Chair of Project SEED Committee, 1992-97.

Statement: I realized during two terms as a Councilor that it is important for each member to understand the governing body of the American Chemical Society (the Society) and to be involved in policy-making activities. I am a member of the Membership Affairs Committee (MAC) and Chair of the sub-committee on Member Retention and Recruitment. MAC is your voice on the governing body. For example, MAC recommended adjusting the dues for recent college graduates to encourage continuous involvement of our young scientists in the Society. Since many members who work in industry find it a challenge to be involved in the Society governance, my roll as a Councilor is important. Through my involvement in the Society my company now sponsors the Division of Analytical Chemistry award for Distinguished Service in this discipline. I would like to continue my involvement in the governing body, helping to put in place programs that encourage young scientists whether in industrial or academic settings. I ask that you vote for me to continue as one of your Councilors.

Socorro M. Ramos

Education: B.S. Chemistry, *cum laude*, College of the Holy Spirit, Manila, Philippines (1972); Ph.D. Organic Chemistry, University of Rhode Island (1980).

Professional Experience: Postdoctoral Fellow (1981-82) Brandeis University; Postdoctoral Fellow (1983-88) Université de Montreal, Canada; Polaroid Corporation Chemical Research Division (since 1988; presently as a Senior Scientist); Polaroid Foundation (1993-97); President, Polaroid Asian Society (1992-93); Advisor, Science and Engineering Network of the New England Board of Higher Education (1994 to present)

Statement: My past involvement with the ACS has been limited to attendance at numerous National and Sectional Meetings and as a co-presenter of papers. While I try to keep up with the society's affairs through C & E News and the Nucleus, I believe that I have not fully exercised my duties as a member. As a Councilor, I believe that I can and will represent the interests of the members of the Northeastern Section and serve as your voice in forums and at council meetings. As a chemist in industry I have been interested in giving students opportunities to gain practical experience of what they have learned in school and to experience the skills that industry needs. For the last 5 years, I have recruited and supervised interns for our department and hopefully, have contributed to their development as chemists. Some have decided to continue their education towards the PhD degree with the intention of teaching, while others have been drawn immediately into industrial careers. Mentoring has been a very fulfilling experience for me. I fully expect to serve the programs of the Section which benefit the members and enhance the image of chemists and chemistry to the community at large.

Alfred Viola

Education: BA 1949, MA 1950, Johns Hopkins University; Ph.D. 1955, University of Maryland.

Professional Experience: Boston University, Research Associate, 1955-57; Northeastern University, 1957-62, Asst. Prof., 1963-68, Assoc. Prof., Professor, 1968-97, Prof. Emeritus 1997-present; Visiting Professor, University of Munich, Germany, 1977, and Monash University, Australia, 1984; Visiting Scholar, Wellesley College, 1992-present.

ACS Service: Councilor 1986-88, 1998-2000; Alternate Councilor 1963-68, 1990-97

NESACS Service: Norris Award Selection Committee 1979-82, 1983-86 (Chair 1981 and 1985); Continuing Education Committee 1989-present, (Co-Chair 1989, Chair 1990-present); Nominating Committee 1998;

Statement: I was honored to receive the Henry A. Hill Award in 1996 for Distinguished Service to the Northeastern Section, but that did not entitle me to sit back on my laurels. As Chair of the Continuing Education Committee I have

been instrumental in bringing National ACS Short Courses to the Section at a fraction of the tuition costs normally associated with that program. I firmly believe this to be a vital activity which the Section must undertake to provide our membership the opportunity to stay abreast of the ever evolving advances and changes in the world of chemistry. Many of the cutting edge topics covered in such courses were not in any curriculum for chemists graduating as recently as five years ago.

In a different vein, I firmly believe that the problems facing the chemical profession and its practitioners are becoming more numerous and profound than at any previous time in the history of the science, but so also are the opportunities for chemistry to contribute to the health and welfare of society as a whole. We must do more to educate our political leadership whose uninformed decisions often hinder scientific progress in this nation. We also must address the rampant scientific illiteracy within the public at large. There is a need for far greater understanding of the truths and misconceptions which abound about the world of chemistry, e.g., Uncle Tom of Maine's toothpaste contains no chemicals. I would appreciate your vote to provide me the opportunity to continue to represent these views within the Northeastern Section and the National Council.

Derek A. Wierda

Education: B.S. Chem. (honors), *summa cum laude*, Loyola College, Md.; M.A., Ph.D. Harvard University

Professional Experience: Post-doctoral fellowship, Strasbourg (France) with John Osborn, Chemistry Dept., St. Anselm College, Manchester, N.H., currently Assoc. Professor

Memberships: ACS, Am. Crystallographic Assn., Council on Undergrad. Research.

Research Interest: Inorganic precursors for chemical vapor deposition and the catalytic activation of small molecules.

Statement: My goal in running for the position of Councilor/Alternate Councilor is to work to increase the involvement of the area's predominately undergraduate institutions in the section. There are numerous smaller institutions in the area that can benefit greatly from involvement in the Section. The individuals at these institutions also have a great deal to offer the Section. Increased involvement will be a mutually beneficial situation and the expanded base of activity will strengthen the Section and broaden its appeal, both in the types of organizations that are involved, but also in the geographical representation. The Section has done an excellent job at promoting undergraduate summer research activities. My hope is that this can continue and that initiatives that involve the section with younger future chemists can be expanded and initiated.

Director-At-Large

(Three-year terms, two to be elected)

Henry Brown

Education: A.B. University of Michigan, 1941. M.D. University of Pennsylvania, 1944. Surgical training University of Pennsylvania 1947-48, University of Wisconsin 1953-60. Gray-Simpson-Priestly award for research. Runyon Cancer Fellowship in Biochemistry, University of Cambridge, England 1952-1953. Nekoosa Fellowship in Surgery 1957-1958.

Professional Experience: Lieutenant Commander Naval Medical Corp, 1945-1946, 1954-1956. Nutrition Facility, Naval Medical Research Institute, Bethesda, MD 1946. Metabolic Research Unit, U.S. Naval Hospital, Oakland, California, 1954-1956. Principal Investigator in various NIH grants in Protein Metabolism and other Intermediary Metabolism of the Liver (Urea Cycle Enzymes). Investigator in other NIH grant projects. Surgical Faculty Harvard past 37 years, at times with joint appointments at MIT Clinical Research Unit, Department of Nutrition and Medical Department. Teacher entire career with usual visiting professorships and sabbatical study.

NESACS Service: Active participant in Sectional and National Meetings for many years. Board of Directors NESACS 1997-2000. Esselen Award Committee 1997-2000, Chair 1998.

Statement: Membership in the American Chemical Society has been one of the most rewarding and enjoyable experiences of my career. I would like to pass on that opportunity to learn and to grow from membership in our Society by expending my energies toward encouraging young people interested in chemistry to join in the fine experience of being a member. That way, I believe, will be the best way our Society will be able not only to help them, but also to ensure the Society's future and continuation of our rich heritage. A parallel goal is to encourage more open communication and cooperation between industry and academia since both have much potential for learning and progressing more rapidly from each other's experience. Even more importantly, I believe, such measures would greatly benefit and reward Society as a whole.

Dudley Robert Herschbach

Education: B.S. degree in Mathematics (1954) and M.S. in Chemistry (1955) at Stanford University, A.M. degree in Physics (1956) and Ph.D. in Chemical Physics (1958) at Harvard.

Professional Experience: Junior Fellow, Harvard (1957-1959); member of the Chemistry Faculty at the University of California, Berkeley (1959-1963); Professor of Chemistry, Harvard University (1963-), Baird Professor of Science (since 1976); Chairman of the Chemical Physics

program (1964-1977) and the Chemistry Department (1977-1980); member of the Faculty Council (1980-1983), and Co-Master with his wife Georgene of Currier House (1981-1986). His teaching includes graduate courses in quantum mechanics, chemical kinetics, molecular spectroscopy, and collision theory, as well as undergraduate courses in physical chemistry and general chemistry for freshmen, his most challenging assignment. He is engaged in several efforts to improve K-12 science education and public understanding of science. He serves as Chair of the Board of Trustees of Science Service, which publishes *Science News* and conducts the Intel Science Talent Search and the Intel International Science and Engineering Fair.

Memberships and Honors: Fellow of the American Academy of Arts and Sciences, the National Academy of Sciences, the American Philosophical Society, and the Royal Chemical Society of Great Britain; Pure Chemistry Prize of the American Chemical Society (1965), the Linus Pauling Medal (1978), the Michael Polanyi Medal (1981), the Irving Langmuir Prize of the American Physical Society (1983), the Nobel Prize in Chemistry (1986), jointly with Yuan T. Lee and John C. Polanyi, and the National Medal of Science (1991).

Research: Published over 350 research papers. Current research is devoted to molecular beam studies of reaction stereodynamics, intermolecular forces in liquids and a dimensional scaling approach to electronic structure.

Statement: Over the past 35 years I have been glad to contribute in a few ways to the activities of the NESACS, chiefly by giving talks at various occasions, including especially student award evenings and for several Richards Awards, serving on the Norris Award Committee and arranging the symposium for the Centennial celebration. I was glad to accept the invitation to "run" for the office of Director-at-Large because the title has some appeal: it suggests a critter allowed to roam happily at will. In fact, I will try to do whatever I can on behalf of the Section, particularly for activities involving students, regardless of whether or not I am elected to an office with such an appealing title. Therefore, in contrast to a traditional candidate, I urge members of the Section to vote for my nominal "opponents" because I am certain they are worthy candidates and, if elected, might be able to do more than I can.

Valerie R. Wilcox

No statement received. The following is taken from the 1994 material for election as Councilor/Alternate Councilor and Section records

Education: M.A. Chemistry, Wellesley College; B.A. Mathematics, College of New Rochelle

Professional Experience: Executive Director, National Plastics Center and Museum, Leominster, Mass. Formerly: Asst. Director, Laboratory Safety Workshop, Curry College; Education Associate, Museum of Science, Boston

ACS Service: Councilor (NESACS) (1992-94); Alt.

Councilor (1984-90;1995-97); Comm. on Chemical Safety (Committee Associate);

NESACS Service: Chair-elect, 1994; Chair, 1995; Past-Chair, 1996; National Chemistry Week Comm. (1991-93), chair 1996;

Nominating Committee

(Three-year term, two to be elected)

Mark R. Froimowitz

Education: B.S. (Chemistry), Brooklyn College (1968); Ph.D. (Physical Chemistry), New York University (1972).

Professional Experience: Research Associate, Graduate Department of Biochemistry, Brandeis University (1972-73); Research Associate, Department of Therapeutic Radiology, New England Medical Center Hospitals (1973-74); Application Analyst, Massachusetts Institute of Technology (1975-76); Instructor, Department of Chemistry, University of Lowell (1976-77); Assistant Biochemist, McLean Hospital (1977-86); Research Associate in Biological Chemistry, Harvard Medical School (1977-79); Instructor in Psychobiology, Harvard Medical School (1979-87); Lecturer, Department of Chemistry, Tufts University (1986); Associate Biochemist, McLean Hospital (1987-93); Assistant Professor (Molecular Pharmacology), Harvard Medical School (1988-94); Research Affiliate, McLean Hospital (1993-94); Senior Scientist, Molecular Design, Pharm-Eco Laboratories (1994-98); Scientific Fellow, Pharm-Eco Laboratories (1998-present). Research in molecular modeling, conformational analysis using experimental and theoretical methods, and the design and synthesis of pharmacological substances with about 60 publications and 3 issued patents.

NESACS Service: Medicinal Chemistry Group: Member (1978-present); Secretary-Treasurer (1981-82); Program Chair (1990); Chairman (1991).

Memberships, Honors: American Association for the Advancement of Science (1972-present); American Chemical Society (1978-present); Society for Neuroscience (1994-present).

James A. Kaufman

Education: B.S., Tufts University, 1965; Ph.D., W.P.I., 1971; Post-Doctoral Fellow, W.P.I. Chemical Engineering Department, 1971-73.

Professional Experience: W.P.I., Instructor (1966-69); Holy Cross College, Res. Assoc. (1970-71); Dow Chemical, Sr. Res. Chemist (1973-77); Curry College, Assoc. Prof. (1977-82), Professor (1982-), Director Health, Safety & Environmental Affairs (1991-93); Laboratory Safety Consultant (1980-); Founder/President The Laboratory Safety Workshop (1981-).

ACS Service: Member, Council Comm. on Chemical Safety (1979-88); Div. of Chemical Health and Safety

(1975-), Editor of Div. newsletter, 1 year; Membership Comm., 6 years, Chmn. (1986); Developed letter on lab safety from ACS President to college/university presidents and national awards for college/university lab safety programs; Organized and chaired Several DCHAS Symposia; ACS Tour Speaker (1991-).

NESACS Service: Director-at-Large (1997-); Councilor (1982-87); Alternate Councilor (1981); Auditor (1981); Health and Safety Comm. (1978-), Chmn. (1978-91, 1996); Editor, NUCLEUS safety column, 2 years; Chmn., Safety Symposium for NERM-8; Safety Symposia for Mass Safety Council Annual Mtg. (1978, 1981); Moderator, Hazardous Waste Symp., Simmons College (1984); Nominating committee (1985, 1994-5); Workplace Chemicals Conference (May 1986); Helped to develop and organized Academic Lab Safety Council (1989); Participated in symposia on lecture demonstrations, home chemical safety, and lab safety; Chairman-Elect (1993); Chairman (1994); Past-Chairman (1995). Lab Safety training seminars for students (1997-).

Amy E. Tapper

Education: B.S. in Chemistry, Boston College (1992); Ph.D. candidate, University of Vermont (1992-1994); Ph.D. in Chemistry, Boston University (expected spring 2001).

Professional Experience: Undergraduate research assistant with Professor E. Joseph Billo, Boston College (1992); Teaching fellow of General Chemistry, Organic and Biochemistry (1992-present); Graduate research assistant with Professor Nicolas Farrell, University of Vermont (1993); Analytical chemist at Aquatec Inc., Colchester, VT (1994-1995); Summer research position at Wyeth-Ayerst Pharmaceuticals, Rouses Point, NY (1995); Graduate research assistant with Professor Pericles Stavropoulos (Iron Mediated Oxidative Damage of Amyloid Fragments in Alzheimer's Disease), Boston University (1995-present); Project SEED (ACS) and Research Science Institute (MIT) summer research project mentor (1995).

Memberships: American Chemical Society (1995-present); NESACS (1995-present); Northeastern Section ACS Younger Chemists Committee (YCC)- Founding member, Co-chair; Co-Chair YCC Career Development Committee; Chair YCC Social Committee; Northeast Student Chemistry Research Conference, Coordinator and Speakers Officer (1998-present); Boston University Graduate Student Organization- Social Chair (1999); Boston University Younger Chemists Committee- Founder and President, Chair Career Development Committee (1999-present); Boston College Young Alumni Association (2000-present).

Dean E. Wilcox

Education: BS (1978), MS (1979), Chemistry, University of California at Riverside; PhD (1984), Chemistry, Massachusetts Institute of Technology.

Professional Experience: Assistant Professor (1984-1990), Associate Professor (1990-1996), Professor (1996-present) of Chemistry at Dartmouth College; invited lectures at 4th International Conference on Bioinorganic Chemistry (7/89), Metals in Biology Gordon Research Conference (1/90), 211th National ACS Meeting (3/96); 4th International Meeting on Metallothionein (9/97), 82nd Canadian Society of Chemists Conference and Exhibition (5/99).

ACS Service: Board of Editors of *Inorganic Chemistry* (1995, 1996)

Memberships: ACS member since 1978; Sigma Xi member since 1984, current President of the Dartmouth Sigma Xi Chapter; member of Society of Biological Inorganic Chemistry; member of International EPR(ESR) Society; organizer of "Metals and DNA", a memorial symposium for Karen Wetterhahn (9/97); advisory committee for EPR Center for the Study of Viable Biological Systems, Dartmouth Medical School (1997-present).

Norris Award Committee:

(Four-year term, two to be elected)

Roy G. Gordon

Education: Harvard: A.B. 1961, A.M. (Physics), 1962, Ph.D. (chem. physics, J.H. Van Vleck) 1964. Junior Fellowships at Toronto and Brussels 1964-66

Professional Experience: Harvard 1966—; Professor 1969—; has served as Chairman of the Department of Chemistry and its Cabot Professor of Chemistry. Sloan Foundation Fellow 1966-69; Einstein Fellow, Israel 1985.

Memberships, Honors: ACS; Fellow, Am. Phys. Soc., AAAS, European Academy of Arts, Sciences and Humanities; Union of Concerned Scientists; Am. Academy of Arts and Sciences; ACS: Award in Pure Chemistry 1972, Baeckeland Award 1979; NESACS Esselen Award 1996; Bourke Award, Faraday Society, R&D 100 Award.

Research: His research spans a wide range of subjects from applied mathematics to quantum mechanics, spectroscopy, intermolecular forces, solid state and materials science.

The chemical kinetics of crystal growth from vapor systems is being studied both theoretically and experimentally in his laboratory. This work has led to the discovery of new materials and new processes for their production, which are being used to make energy conserving windows, solar photovoltaic cells, and computer microcircuits.

Frederick D. Greene

Education: B.A. 1949, Amherst College; Ph.D. 1952, Harvard University

Professional Experience: Research Associate 1952-53,

UCLA; MIT, Professor, Department of Chemistry, Massachusetts Institute of Technology; 1953-present (Emeritus, 1995).

Memberships, Honors: ACS 1953-; Fellow, AAAS; Amherst College Sc.D. (Hon.) 1969; MIT School of Science Teaching Prize for Undergraduate Education 1991; American Academy of Arts and Sciences

ACS Service: Editor, *J. Org. Chem.*, 1962-88.

NESACS Service: Richards Medal Committee, 1990-93

Research: Organic chemistry: mechanisms of organic reactions.

Michael J. Henchman

Education: A.B., Cambridge University; Ph.D., Yale University (Rich. Wolfgang); post-doctoral fellowship, Cambridge University

Professional Experience: University of Leeds, 1961-67; Brandeis University 1967-; Visiting Scientist: Birmingham, Göttingen, US Air Force at Hanscom Field. organized symposia for BCCE and ACS Meetings (2 for the last Boston ACS Meeting). Since 1992, I have taught science to non-scientists — chemistry, interlarded with art, to willing audiences of studio artists and art historians ... and recently, in 5 NSF workshops, to faculty from ~120 institutions interested in doing likewise. Student projects have included the de-authentication of a \$1M Impressionist painting, a procedure to evaluate the cleaning of the Sistine Chapel ceiling, and interactive programs for the scientific investigation of art.

Research: Gas-phase ion chemistry as a new approach to old problems — simulating solution chemistry in the gas phase, using selectively solvated reactants ... and studying the synthetic organic chemistry, which, at 10 K, governs almost all of the organic compounds in the cosmos.

Robert S. Umans

Education: A.B., Columbia University, 1962; M.S., Yale University, 1963; Ph.D., Yale University, 1966; NIH Postdoctoral Fellow, Johns Hopkins University, 1966-1968; Postdoctoral Fellow, University of Paris, 1968-1969.

Professional Experience: Boston University, Director of Life Science and Biochemistry Laboratories, 1999-present; Boston College, Adjunct Associate Professor of Chemistry and Assistant Director of Undergraduate Laboratories, 1993-1999; University of New Hampshire, Faculty in Residence in Biochemistry, 1991-1993; Wellesley College, Assistant Professor of Chemistry, 1986-1990; Harvard School of Public Health, Research Fellow and Research Associate, 1980-1986; Wellesley College, Assistant Professor of Chemistry, 1977-1979; Boston College, Assistant Professor of Chemistry, 1976-1977; Boston University, Assistant Professor of Chemistry, 1969-1975.

Memberships: ACS 1969-.

NESACS Service: Norris Award Committee: 1996-2000, chair, 2000. ◇

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Calendar

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“Catalysis with Unusual Materials”
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May 31-June 3

26th Annual National Meeting of the Clinical
Ligand Assay Society
“Molecular for the Millennium”
Boston Park Plaza Hotel
Information: Dr. David Drum (617) 732-
6987, page 11161, dedrum@earthlink.net

June 21

Prof. Ivan Stamenkovic (Mass General
Hospital)
“Affinity Capillary Electrophoretic
Determination of the Effect of Glycosylation
on CD44-Mediated Adhesion”
Boston Glycobiology Discussion Group
MIT Faculty Club, 6 PM
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email: cecmms@bu.edu

BOOK REVIEW

Joy L. Bryant, *Protecting Your Ideas: The Inventor's Guide to Patents.*

Academic Press, 1999. 222 pages. ISBN 0-12-138410-1, \$25.

Reviewed by Stanley H. Mervis, Associate Patent Counsel, Polaroid Corp. (Retired).

It has been said that a patent application is one of the most difficult legal documents to prepare. It also has been said that a patent is one of the most difficult documents to read and understand. It often seems to be written in a language all its own called "patentesse". The whole process of getting a patent issued is complex enough that the U. S. Patent and Trademark Office (USPTO) will not permit an attorney or anyone else to represent a patent applicant during the examination unless he or she has passed a special registration examination. No other government agency so restricts an attorney. Indeed, many of the attorneys who litigate patents have never prepared a patent application nor are they registered to practice in the USPTO.

How then is an inventor to gain even the rudimentary knowledge to understand the patent process and to assist the patent attorney or patent agent (both grouped together by the author under the generic term: "patent practitioner")? This is the challenge accepted by Joy L. Bryant, and she has written a very readable and useful response to that challenge.

Joy L. Bryant is a registered patent agent, not an attorney. As such, she has specialized in the preparation and prosecution of patent applications, the ideal background for writing this book. Many of the numerous illustrations are reproduced from patents she has prepared. She has interfaced directly with the inventors, and this book clearly reflects her experience in "educating" inventors.

Bryant is the founder and presi-

dent of the National Association of Patent Practitioners. Its web site (www.napp.org) has information useful to inventors considering patenting an invention, including links to sites with other useful information.

The author has a very simple but highly effective method of emphasizing very important points. She does this by introducing a short indented paragraph, usually only one sentence long, stating the point and headed by "WARNING" or "TIP". When you see such a paragraph, read it and remember it. A similar technique is used to highlight the definition of various terms.

Bryant begins with a bare bones but adequate explanation of the differences between a trademark, a copyright, a trade secret and a patent – what each is and is not. She then devotes full attention to explaining the process of preparing and prosecuting a U. S. patent application through to the issuance of the patent. Using plain English, she describes the several types of patents — utility, design and plant — and the legal requirements that must be satisfied before a patent will be issued. And she tells the reader early on what a patent is and what it is not: a patent does not give the inventor the right to sell the invention but rather the right to exclude others from practicing the invention (page 24).

A chart in Figure 2.1 (page 41) shows the growth trend in the number of U. S. applications filed and patents issued from 1992 to 1996. Just released data, however, suggests a much sharper upward trend since 1996 with 270,000 applications filed and 161,000 patents issued in 1999.

A blip in Figure 2.1 for the number of applications filed in 1995 is explained as due to a rush to file applications before June 8, 1995 in order to be entitled to a patent term of 17 years from issue instead of 20 years from the filing date for later filed applications. Legislation signed November 29, 1999 guarantees that U. S. patents will have a term of at least 17 years even though the application was pending more than 3 years if the delays were not the applicant's fault, e.g., the delay was the

result of an appellate proceeding or an interference.

The law establishing a patent term of 20 years from the date of filing also adopted a plan to publish U. S. patent applications 18 months after filing even though they were still pending. Historically all U. S. patent applications have been held in strict secrecy until they issued as patents, so this plan threatened to make public the contents of patent applications that never became patents. Many inventors viewed this as a threat. This early publication plan was never implemented, and Bryant does not discuss it. The November 29, 1999 law modified this early publication law, effective November 29, 2000, excluding applications whose inventor(s) request exclusion and state that the application has not been filed in foreign countries. The effect is to preserve the secrecy of such pending U. S. applications until the U. S. patent issues, while opening to inspection pending U. S. applications corresponding to foreign applications.

After explaining the difference between the U. S. "first to invent" patent system and the "first to file" system of most foreign countries, Bryant reviews how notebooks and other records should be kept to provide the evidence necessary to document the inventor's activities and experimental results (chapter 4, page 87 et seq.). These records are vital evidence to support a claim that the invention was made on a particular date, a necessary step if someone else claims the same invention and an interference is declared to determine who was the first inventor.

The first step in the patent process is a meeting with a patent practitioner, and Bryant gives a good summary of what should be discussed and why (page 131). Appendix IV "What the Patent Practitioner Needs" provides a very useful checklist for preparing for such a meeting (page 211). It should be understood, however, that the inventor need not, and preferably should not, wait until all of this information is available before initiating this discussion. An early discussion is very desirable.

Bryant explains what "concep-

tion" of an invention means (page 77) and the difference between an "actual reduction to practice" and a "constructive reduction to practice" (page 78). Relatively simple mechanical inventions, in particular, may lend themselves to obtaining a constructive reduction to practice by filing a patent application even before a device has actually been made.

The desirability of searching the literature – technical and patent – early in the invention process is emphasized for it may save time and money (Chapter 5, page 97). Such research may reveal that the problem has already been solved and the inventor should tackle a different problem, or it may reinforce the inventor's belief that his or her proposed solution is unobvious. Useful tools in solving the problem may be uncovered. It cannot be emphasized too much that non-patent literature should be searched, as relevant information may be disclosed in technical literature before a patent is published and in non-technical literature via announcements of new products or in "how to do it" articles. Even meeting "abstracts" may disclose relevant information.

Patent and Trademark Depository Libraries are mentioned as a good place to search U. S. patents (page 100). New U. S. patents are provided to these libraries shortly after issue, and a trained staff is available to assist inventors with their search. This service is free. A list of these libraries as of January 1998 is given in Appendix II (page 205). More recently the Boston Public Library joined libraries in Detroit, Houston and Sunnyvale, CA in being designated a Partnership Patent and Trademark Depository Library. These libraries can offer additional PTO specialized services and products on a fee-for-service basis. These additional services include access to PTO databases otherwise only available at the PTO in Arlington, VA.

Bryant points out that if a search identifies a prior patent relevant to the invention, the references cited by the examiner in that patent should be reviewed as part of the search (page 105). Some of these references proba-

bly were found by the examiner, but others probably were called to the examiner's attention by the patentee having noted them in an "Information Disclosure Statement" (page 170). This "Statement", usually filed with the application, discusses the relevance of prior art the applicant wants to be sure the examiner considers. That helps satisfy the applicant's obligation to disclose all references known to the applicant which may be considered to be "material to the patentability of the invention".

Chapter 6 should be read very carefully as it points out U. S. statutory bars which must be avoided at all costs (page 109). Illustrative of such bars is publishing an article disclosing the invention more than a year before the patent application is filed. (Doing that even one day before the application is filed can bar a foreign patent application.) A table in Figure 6.1 (page 123) summarizes these bars.

Patentability requires that the invention to be patented be "novel" – not described in a *single* prior art reference (page 135). If the invention passes this test, it could still be unpatentable if the differences between it and the prior art would have been *obvious* to a person of ordinary skill in the art (page 137). Secondary prior art references are usually cited to support a rejection based on obviousness. The author's discussion of such a rejection unfortunately fails to point out that this test is applied to the prior art as it existed *at the time the invention was made*. Hindsight at the time of examination cannot be used to argue an invention was obvious.

Bryant's discussion of the parts of a patent application (page 139) does a good job of explaining the function and content of each part. Many readers of patents fail to understand the difference between the *specification* and the *claims*. The specification explains what the invention is and the problem solved, and discloses how to practice the invention, including the best mode of practicing the invention known to the inventor. Sometimes the specification discloses several inventions, and the examiner may require them to be

claimed in separate applications.

The invention that the examiner will examine is that set forth in the numbered paragraphs at the end of the specification. These are the claims. They define the scope of the invention that will be protected if a patent is issued. Bryant uses an analogy I like to use: claims are like a deed of land in that they define the metes and bounds of the patented invention (page 24). The inventor should work very closely with the patent practitioner to ensure the claims recite the important limitations and do not include unnecessary limitations.

Bryant explains that the claims are written in a form unique to patents: each is a single paragraph, a few lines or several pages in length, with a single period at the end. Clauses within the paragraph are separated by commas and semi-colons. Terms that are seemingly synonyms may have major differences in meaning in claims. A notorious example is "comprising" and "consisting of" (page 140). "Comprising" in a claim has been judicially interpreted to mean that certain recited elements are present but others may be present also, whereas "consisting of" means that only the recited elements are present.

Bryant further explains that the claims may be independent or dependent in form, and that they are structured to protect key features of the invention, expressed as combinations or subcombinations, as necessary to provide the desired scope of patent protection (page 141). Figures 7.1 and 7.2 illustrate the use of dependent claims for this purpose (pages 143-144). Narrow claims may be independent or dependent. While it is true that the PTO fee is greater if there are more than three independent claims, I feel very strongly this extra fee should not control the choice of claim form.

What happens after the PTO receives a patent application, and what the patent practitioner does in response, is summarized nicely (page 173). Figure 8.9 provides a good flow chart of the patent prosecution process, together with a typical timetable for each step. While Bryant estimates the

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Book Review

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time from filing to patent issuance to be 20 months, this estimate is really a PTO objective and the actual time varies with the subject matter of the application. Should an application be twice rejected, the applicant may decide to appeal the rejection and this will significantly lengthen this time. An alternative option may be to file a replacement application, either a continuation or a continuation-in-part, and thus continue to pursue patent protection. Bryant discusses these options. Assuming the invention is not the subject of a foreign filing and that the subject matter has not been sold or published in any form, an option not mentioned by Bryant is to abandon the application and treat the subject matter as a trade secret.

Foreign patents are not ignored. The author points out that it is necessary to file for patents in each country in which protection is desired (page 60). She discusses the treaty known as the Paris Convention, which is the

basis for a country giving a patent applicant a right of priority corresponding to the date an earlier application was filed if it was filed no more than 12 months earlier in another country. In this discussion on page 62, Bryant states that this priority is "based on an earlier filed application in the person's native country" (emphasis added). This is incorrect. It is only necessary that both countries have adopted the Paris Convention. Thus a U. S. citizen who files an application first in Great Britain may claim priority from that application if he files a corresponding application within 12 months in any other country, including the U. S., which also has adopted the Paris Convention. (It should be understood that U. S. law requires an inventor who makes an invention in this country to obtain a foreign filing license if he wishes to file his patent application in another country before filing in the U. S. Such licenses normally are easy to obtain unless the invention falls into a security category. If the first application is filed in the U. S. the filing receipt will include a foreign filing

license.)

Filing in a plurality of countries has been greatly eased by the adoption of the Patent Cooperation Treaty (PCT). This treaty permits an applicant to file a single application in a PCT receiving office (such as the USPTO) and to designate the countries for which he will claim a right of priority under the Paris Convention in later prosecution (page 63). The original application may be in any of the most widely used languages, and translation into other languages is delayed. The timetable for the various steps involved with a PCT application is set forth in Figure 2.6 (page 66), and the deadlines are critical. It is important to understand that while a PCT application is frequently referred to as an "international application", it is an international application only in the context of the procedure for filing an application in a plurality of countries. Each PCT application is searched but that search is not binding on the countries in which corresponding applications are later filed, a phase known as the "national phase". Each such country is free to decide whether or not to grant a patent. PCT applications are being used in ever increasing numbers as this system allows the applicant to preserve his priority right while deferring the decision to proceed with prosecution and where to file national applications until more information is available. This is particularly important where commercial significance has not yet been established.

Joy L. Bryant has packed a lot of useful information into a small book that can be read cover to cover in a few hours. I am confident the reader will return to *Protecting Your Ideas: The Inventor's Guide to Protecting Your Ideas* frequently. This book will help the reader be more comfortable and more effective in working with a patent practitioner. It is unusual to find a book relating to any field of law which is written in plain English. Bryant has succeeded in explaining patent law in plain English. I recommend this book to anyone interested in understanding the patent process, and I particularly recommend it to the new inventor. ◇

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From the Richards Award Meeting March 16, 2000



*L to R: Richards Medal Award Meeting:
Drs. M. El-Sayed, Myron Simon and Prof. Dudley Herschbach*



*L to R: Ms. Belinda Hahn (daughter-in-law), Ivan Sayed (son),
Prof. El-Sayed*

*Medal presentation:
L to R
Dr. Doris Lewis, Chair,
Dr. El-Sayed*



Health and Safety Course

Chemical Health And Safety Certificate

There has been an increased interest and growing concern in health and safety issues in both the workplace as well as the environment throughout the past decade. Employment opportunities in the allied health and sciences field as well as the management of these fields is growing.

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academia, and government. This is increasingly valuable in light of recent enforcement actions by EPA and OSHA as well as the attention that environmental quality and workplace health and safety is receiving. Many employers now ask if a graduate has had any training in health and safety matters in addition to a college degree.

Thanks to a grant from the Davis Educational Foundation, Professors Armen Casparian, Wentworth Institute of Technology, and James Piper, Simmons College, developed a certificate program in chemical health and safety to meet this need. The cornerstones of the program are a course in Chemical Health and Safety, to be offered at Wentworth Institute of Technology, and an internship.

The program is also open to greater Boston area high school chemistry teachers and other qualified individuals. It is scheduled to begin in May of 2000. Enrollment in just the **3-credit Chemical Health and Safety course** is open to interested individu-

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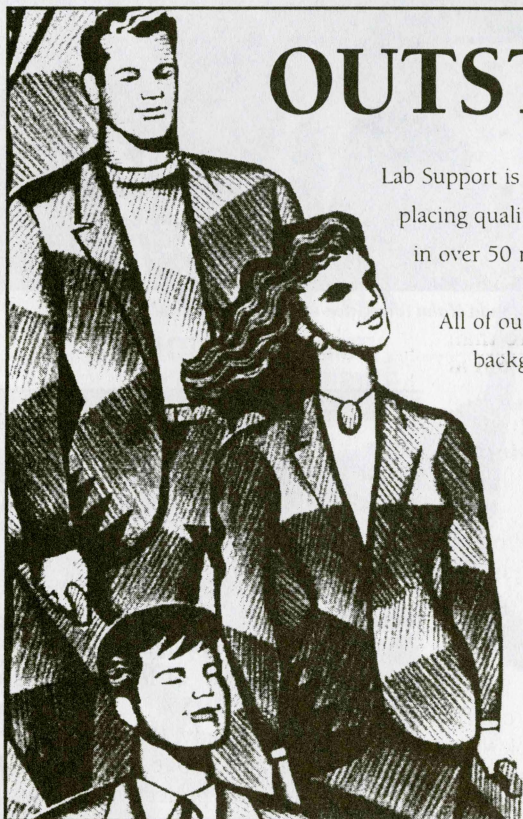
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als, who have had a basic course in college chemistry. It will be offered this summer, beginning in early May.

Several prospective employers from both industry and academia have been contacted with highly favorable responses for graduates with this type of background. Positions include chemical health and safety officerships, laboratory management, regulatory affairs, and health and safety auditors.

For further information or details of either the course or program requirements, please contact Professor Armen Casparian at (617) 989-4346 or e-mail at caspariana@admin.wit.edu as soon as possible ◇



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Meeting Report

Vitamin E And The Prevention Of Heart Disease

by William A. Pryor, Ph.D.

The Biodynamics Institute Louisiana State University Baton Rouge, LA

From the address given by Dr. Pryor on the occasion of receiving the NESACS Gustavus John Esselen Award, April 13, 2000

Introduction and LDL Oxidation.

The chemistry and biology of vitamin E has been the subject of intensive study for more than 50 years, and this enormous body of literature demonstrates conclusively that the principal role of vitamin E is to protect tissue against unwanted, destructive oxidation (1,2). In recent years, it has become clear that oxidative events play a crucial role in the pathogenesis of atherosclerosis, and the biological plausibility for a role for vitamin E in preventing heart disease has been generally accepted (2,3). At the same time, epidemiological data, dietary studies, and intervention trial data have become available. The hypothesis that vitamin E may help prevent heart disease when part of a diet that is rich in fruit and vegetables and low in saturated fat has now achieved considerable acceptance. A substantial fraction of all Americans (4,5), including about half of the physicians in the field (6), now take vitamin E supplements.

Vitamin E is believed to help prevent cardiovascular disease (CVD) because of its ability to block the oxidation of the low-density lipoprotein (LDL) particle, since LDL oxidation is thought to play a key role in the development of atherosclerosis (7-13). The theory of LDL oxidation and data on the oxidizability of LDL from humans on various antioxidant-rich diets has been summarized recently by several authors (see the summary in ref (2)).

Animal Data.

In considering the totality of evidence

for cardioprotection by vitamin E, the animal work that has been done over the past several decades must be considered (14-16). All the animal work is, in general, supportive of a protective role for vitamin E (2,3,17).

Observational Studies.

This field has been reviewed recently (2), so the coverage here will be greatly abbreviated. However, it must be recognized in judging the totality of evidence that observational studies have provided a strong core of research supporting a role for vitamin E in preventing CVD.

Descriptive epidemiological studies.

Gey, a research worker who contributed many of the earliest epidemiological studies of micronutrients, has commented (18): The MONICA cross-cultural studies (139 centers in 26 countries), the Edinburgh Case-Control study (6000 males) and the Basel Prospective Study (3000 males) all "...consistently reveal an increased risk of ischemic heart disease and stroke for low plasma levels of antioxidants, with the rank order: lipid- standardized vitamin E >> carotene ≈, vitamin C > vitamin A, independent of classical risk factors..."

Prospective cohort studies.

This type of dietary study collects data prior to the development of disease and therefore is thought to be less subject to confounding by recall bias and subject selection (19). The Nurses' Health Study, the largest study of this type reported to date, involved more than 120,000 nurses, 30 to 35 years old at the beginning of the study in 1976; a cohort of more than 80,000 women, free of CVD at entry, gave dietary information using a semi-quantitative food -frequency questionnaire, and were followed for 8 years (20). Women in the highest versus the lowest quintile of vitamin E intake had a relative risk of major coronary disease of 0.66 (95% CI = 0.50 to 0.87) after adjustment for age, smoking, and other related factors (20). (CI is the confidence interval.) Women who took vitamin E supplements for a short time showed little benefit, but those who

took them for longer times had a relative risk of major coronary disease of 0.59 (95% CI = 0.38 to 0.91) after adjustment for age, smoking status, and the use of other vitamin supplements (20).

Those women in the Nurses' Health Study who obtained their vitamin E *from diet alone* had a small and statistically non -significant reduction in the relative risk for developing CVD (21). Women in the highest quintile of vitamin E intake from supplement use, and who had used supplements for at least two years, had a relative risk of nonfatal MI or death from coronary disease of 0.54 (95% CI = 0.36 to 0.82) (21). A protective effect was not found for vitamin C. The relative risk for non-fatal MI or death from CVD for the highest versus the lowest quintile in vitamin C intake was 0.80 (95% CI = 0.58 to 1.10) (21), but vitamin E and vitamin C intake were highly correlated, and after controlling for vitamin E and multivitamin intake, the correlation for vitamin C became non-significant (20).

A similar study of male health professionals found very similar results (22). The Health Professionals Follow-up Study enrolled 39,910 men 40 to 75 years old at entry, from the total cohort of 51,529, who were free of heart disease, diabetes, and had normal cholesterol levels at entry and followed them for 4 years. Again, *dietary* intakes of vitamin E were found to be strongly, but not significantly correlated with reduced risk for coronary heart disease or death (21). Men in the highest quintile of vitamin E intake from supplements had a relative risk of non-fatal MI or fatal heart disease events of 0.68, and the effect was largely confined to those who took at least 100 IU/d supplemental vitamin E for at least two years (22). For men taking more than 250 IU/d vitamin E versus non-users of supplements, the relative risk for non-fatal MI, coronary revascularization, or heart disease death was 0.70 (95% CI = 0.55 to 0.89) (21). This study, like the Nurses' Study described above, did not find that vitamin C was protective.

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Meeting Report

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The similarity of the relative risk for both women (0.66) and men (0.68) for the supplement users in these two independently run studies with quite different populations leads to increased confidence in the results (20). The differences between the results for vitamin E and vitamin C suggests that self-selection of particularly healthy individuals to use vitamin supplements was not a confounding variable; if self-selection were a confounding variable, those healthy individuals who took vitamin E would also have been expected to take vitamin C.

Arterial Imaging Studies.

Trials involving the direct visualization of arterial status while subjects are on antioxidant supplementation are relatively new and potentially provide an early measure of the development of atherosclerosis (2). The Cholesterol Lowering Atherosclerosis Study (CLAS) was the first to use this method to follow the progression of atherosclerosis (23). The intervention

involved self-selected vitamin E supplementation in connection with administration of the cholesterol-lowering drugs colestipol and niacin (23-28). The authors have studied subjects given or not given the drug combination and who were getting vitamin E only from their diet versus those getting additional vitamin E from supplements. The results have been reported for subjects with occlusions classed as mild-to-moderate lesions or all lesions (23,25,26). Hodis, the lead investigator, summarizes the findings as follows (23): Subjects with vitamin E intakes \geq 100 IU/d demonstrated less coronary artery lesion progression (judged as the per-subject change in % diameter) than did subjects with \leq 100 IU/d, with improvement observed both for the groups taking and not taking the colestipol-niacin drug combination (23,25,26). Dietary intake of vitamin E (as opposed to vitamin E supplements) was inversely but non-significantly associated with progression of CVD (23).

Large Intervention Trials.

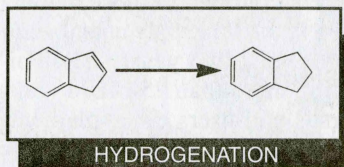
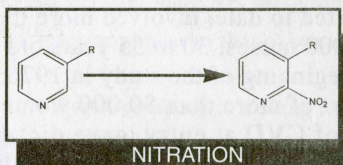
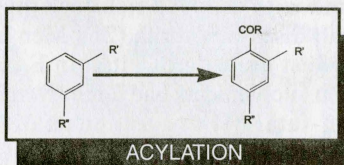
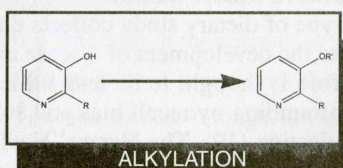
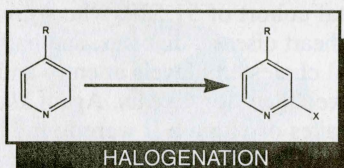
1. The Cambridge Heart Antioxidant

Study (CHAOS) trial is a secondary prevention trial that enrolled subjects with already proven heart disease (29). A total of 2,002 subjects with angiographically proven CVD were randomized to receive vitamin E or placebo; the first 546 subjects in the tocopherol group were given 800 IU/d and the remainder 400 IU/d, but the two groups were combined for statistical analysis. After 510 days, those on vitamin E experienced a significant 47% reduction (95% CI = -66 to -17%; $p = 0.005$) in CVD death and non-fatal MI (29,30). This effect was due to a very significant 77% reduction (95% CI = -89 to -53%; $p = 0.005$) in the risk for non-fatal MI. However, there was no effect on CVD death.

The slight, non-significant increase in deaths due to CVD in this trial has been subjected to a later, thorough analysis (30). This analysis shows that of the total of 72 deaths, just 6 were in the group that was taking vitamin E, 21 were in vitamin E group but were non-compliant, and 32 were in the placebo group (31). The authors comment (30): "These findings can not ...lead to different conclusions from an intention-to-treat analysis, which however may have underestimated the true benefit of alpha tocopherol... patients currently taking alpha tocopherol (nearly a quarter of all CHAOS patients) accounted for only 6 of the 59 deaths from ischemic heart disease."

2. The Linxian China study is a primary prevention trial that tested the effect of four combinations of micronutrients on overall mortality and cancer mortality (32). The subjects were 29,584 persons 40 to 69 years old in the Linxian, China, area. They were randomized to receive placebo; retinol and zinc; riboflavin and niacin; vitamin C and molybdenum; or vitamin E (30 mg), beta carotene (15 mg), and selenium (50, μ g). This area has one of the world's highest rates of esophageal/gastric cancer and a low dietary intake of several micronutrients. After a 5.25 year follow up period, there were a total of 2,127 deaths among the trial participants with 32% of all deaths due to

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Meeting Report

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esophageal or stomach cancer and 25% due to cerebrovascular disease (32). Of the four vitamin regimens tested, only the group on vitamin C, vitamin E, and selenium showed benefits. In this group there was a significant 9% reduction in total mortality; the relative risk of all-cause mortality was 0.91 (95% CI 0.84 to 0.99) for the group on the antioxidants. This reduction in total mortality was mainly due to a 13% reduction in cancer rates (relative risk 0.87; 95% CI = 0.75 to 1.00), especially stomach cancer which was reduced 13% (95% CI = 0.64 to 0.99). The reduced risk began to arise about 1 to 2 years after the start of the supplementation with these micronutrients. There is biological plausibility for an induction period before the benefits of vitamin E are fully evident, since vitamin E must build up in tissues and membranes in which lipids are present. There also was a *reduced* relative risk for cerebrovascular mortality that was not statistically significant; the relative risk for the group on vitamin E, beta carotene and selenium was 0.90 (95% CI = 0.76 to 1.07) (32). Notice that this trial used a small dose of vitamin E, 30 mg, much smaller than the amount that the Nurses' Health Study, the Allied Health Professionals Study, or CHAOS found protective.

3. The ATBC trial was designed to test whether supplementation with vitamin E, beta carotene, or both micronutrients together would reduce the risk of lung and other cancers in heavy smokers (33). A group of 29,133 Finnish males who were smokers were given synthetic vitamin E (50 mg), beta carotene (20 mg), or both, or a placebo. Notice that the ATBC trial, like the Linxain trial, used a small dose of vitamin E (50 mg), and the vitamin E that was used was synthetic (33), making the dose given equivalent to an even smaller amount of natural vitamin E. The ATBC trial found an increased risk for lung cancer, the primary end point of the trial, for heavy smokers who took beta carotene rather than a

placebo. In a sub-group analysis for ischemic heart disease, the number of cases suffering mortality was 602 for those on, and 637 for those not on, vitamin E. Thus, although vitamin E provided a slight protection against ischemic heart disease mortality, the difference did not achieve statistical significance.

An analysis of the prevention of angina was done in a subgroup of the ATBC trial that already suffered from angina (34). The relative risk for recurrence of angina in those who took vitamin E alone was 1.06 (95% CI = 0.85 to 1.33); thus no significant protective effect for vitamin E was found. The results for beta carotene were almost identical to those for vitamin E (34).

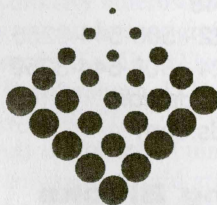
4. The GISSI trial involved 11,324 Italians who had a myocardial infarction (MI) within three months of entry into the trial (35). Participants were given either 0.9 g of a mixture of n-3 polyunsaturated fatty acids (PUFA; "fish oils"), 300 mg synthetic vitamin E, both, or neither. The first publication from this trial is complex, with 55 relative risks presented. The PUFA mixture significantly lowered the risk for

death, non-fatal MI, and stroke by 10% (95% CI, 1% to 18%). Treatment with vitamin E lowered the risk for the primary endpoints, but not significantly. It should be noted that the GISSI patients, as expected from their recent MI, were taking aspirin, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, and possibly statins.

In comments on the GISSI trial, Jialal et al. (36) state: "...the investigators' conclusion that α -tocopherol was without [significant] benefit is inappropriate and misleading a careful analysis of their findings reveals that α -tocopherol supplementation resulted in the following significant effects when the ...appropriate fourway analysis was undertaken: 20% reduction in cardiovascular deaths, 23% reduction in cardiac death, 25% reduction in coronary death, 35% reduction in sudden death ... Thus, the GISSI results are in accord with the published work on the potential beneficial effects of α -tocopherol therapy in the secondary prevention of CVD." Salen et al. (37) comment: "Cardiovascular mortality was significantly reduced by vitamin E in GISSI and the effect on overall sur-

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Meeting Report

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vival showed a very favorable trend..." The other letters, including that by Hopper et al. (38), Ng et al. (39), and the reply by the GISSI authors (40) also should be read.

5. The HOPE trial is a secondary trial involving 9,297 high risk Canadian men and women, 55 years and older, who were given 400 IU/d natural source vitamin E and/or 10 mg/d of ramipril, an ACE inhibitor (41). The results indicate that ramipril appears to be strongly protective against the primary end points (MI, stroke, or CVD death). The results for vitamin E did not achieve statistical significance in the four years of the study, and the vitamin E portion of this study is to be continued. Possible explanations for the ineffectiveness of vitamin E in this trial is that this population, like that in the GISSI trial, was taking aspirin, statins, diuretics, calcium-channel blockers, and beta-blockers. In addition, trial participants were allowed to

continue using non-trial vitamin E if they were doing so at entry, and about 3.5% of both the vitamin E and non-vitamin E group was taking non-trial vitamin E (personal communication). Unfortunately, no measure of oxidative stress status (OSS) was measured, not even plasma vitamin E levels, so there is not evidence that the intervention actually affected the OSS of the participants. The form of vitamin E used in this trial, natural-source d-alpha-tocopheryl acetate, is absorbed very slowly if not taken with a meal containing some fats.

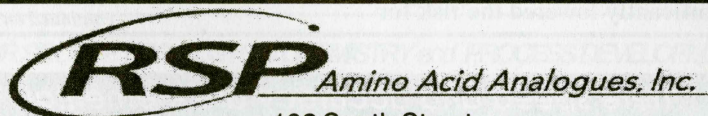
Conclusions.

Vitamin E at the supplemental levels being used in the current trials, 100 to 800 IU/d, is established as safe, and there is little likelihood that increased risk will be found for those taking supplements. It will be extremely difficult to do trials that adequately probe the dose-effect curve for vitamin E for every disease, or to do studies of all the possible combinations of other micronutrients that might interact with vitamin E to improve its effectiveness. So there never will be a time when the

science is "complete". At one point, the weight of the scientific evidence must be judged adequate. It is this reviewer's opinion that we now have sufficient evidence to recommend vitamin E, as part of a general program of heart-healthy behavior that includes a fruit and vegetable rich diet and exercise, to the general population.

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Puzzle Column

Solution of the Puzzle in April

All of the digits from 0 thru 9 appear once in the multiplication problem below. Fill in the missing digits and solve the problem.

$$??? \times 27 = ?????$$

Answer: $594 \times 27 = 16038$

Rewriting the problem in algebraic form: $abcx27=defgh$. Here are the clues I used: (i) Since the product is a five-digit number, for the product of $abc \times 27$, d must be 1 ("2" is already used), and a can be 5,6,8, or 9.

(ii) Since no digit can appear twice, c can't be 1, since $1 \times 7 = 7$; c can only be 3,4,8, or 9. I then set up the multiplication on an Excel spreadsheet and tried the possible values of b , beginning with $a=5$ and $c=3$, and examined the result visually.

The answer: $594 \times 27 = 16038$.

[I used the same limitations, but tried all possible choices on a hand calculator and got the same answer in about 10 min., ed] ◇

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**Please send your CV,
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<http://people.ne.mediaone.net/obermayer/nesac>

Apr. 19

Prof. Yann Schrodi (Mass. Inst. Tech.)
"Group 4 Metal Diamido-Donor Complexes:
Development of New Ziegler-Natta
Polymerization Catalysts"
Mass. Inst. of Tech.
Bldg. 6, Rm. 120, 4 PM

Apr. 20

Prof. Robert Bergman (Univ. CA, Berkeley)
"Chemo- and Enantioselective Reactions of
Metal-Heteroatom Bonds with Organic
Molecules"
Boston College
Merkert Chemistry Ctr., Rm.130, 4 PM
Prof. Mostafa El-Sayed (Georgia Inst. Tech.)
Title TBA
Harvard Univ.
Room MB23, 5 PM
Prof. Jay Siegel (Univ. CA, San Diego)
Title TBA
Mass. Inst. of Tech.
Bldg. 6, Rm. 120, 4 PM

Apr. 24

Prof. Andrew G. Meyer (Harvard Univ.)
TBA
Boston University
Metcalf Science Center Auditorium, 4 PM

April 25 and 26

Clinical Ligand Assay Society
"Management and Technology for the New
Millennium"
Northeast Region Conference & Exhibition
Boxborough Holiday Inn
Information: Dale Harrison (800) 372-1782,
x6100
Registration: www.melabs.org and
http://home.att.net/~baystate_clma

Apr. 26

Prof. Fred C. Anson (Cal. Inst. Tech.)
"New Catalysts for an Old Reaction: How to
Reduce Dioxide Directly to Water at Graphite
Electrodes"
Mass. Inst. Tech.
Bldg. 6, Rm. 120, 4 PM

Apr. 27

Prof. Thomas Michel (Harvard Med. Sch.)
"Post-translational Modification of the
Endothelial Nitric Oxide Synthase"
Mass. Inst. of Tech.
Bldg. 6, Rm. 120, 4 PM
Prof. Stuart Rice (Univ. Chicago)
"Optical Control of Molecular Dynamics: The
Current Status"
Mass. Inst. of Tech.
Bldg. 2, Rm. 270, 5 PM
Prof. Peter Gannett (West Virginia School of
Pharmacy)
"The Role of Free Radicals in Aryl Hydrazine
Carcinogenesis"
Northeastern Univ.
Hurtig Bldg., Rm 129, 4 PM

Apr. 28

Dr. Mihael H. Polymeropoulos (Novartis
Pharmaceuticals Corp.)
"The Genomic Era of Drug Discovery"
Boston Univ.
R. B. Hariri Bldg., Rm. 220, 2 PM

May 1

Prof. Bassam Z. Shkhashiri (Univ. Wisconsin-
Madison)
"The Privilege of Teaching and Exhortations for
Good Teaching"
Boston University
Metcalf Science Center Auditorium, 4 PM

May 1-2

Prof. K. C. Nicolaou (Scripps Res. Inst.)
Titles TBA
Harvard Univ.
Pfizer Lect. Hall, Mb 23, 4:15 PM

May 2

Dr. Bruno Doman (Biogen Corp.)
"Qualitative and Quantitative Analysis of the
Glycosylation Pattern of Recombinant Proteins"
Boston Glycobiology Discussion Group
MIT Faculty Club, 6 PM
Call (781) 642-0025 for dinner reservations

May 3

Prof. Tom Ziegler (Univ. Calgary)
"Density Functional Theory as A Practical Tool
in Transition Metal Chemistry. Beating the
Heavy Metal Blues with DFT"
Mass. Inst. of Tech.
Bldg. 6, Rm. 120, 4 PM

May 4

Prof. Carlos J. Bustamante (Univ. California,
Berkeley)
Title TBA
Harvard Univ.
Room MB23, 5 PM
Dr. David Fine (Thermo Electron, Corp.)
"Some Approaches to Stimulating Innovation in
a Commercial Setting"
Northeastern Univ.
Hurtig Bldg., Rm 129, 4 PM

May 8

Prof. Mercuri Kanatzidis (Michigan State Univ.)
"Frozen Charge Density Waves in
Polytellurides"
Brandeis University
Gerstenzang 122, 4 PM

May 9

Prof. Francis Johnson (SUNY Stony Brook)
"The Artificial Creation of Naturally-Occurring
DNA Damage"
Tufts University
Pearson Hall, Rm. 106, 4:30 PM

May 10

2000 Peter A. Leermakers Symposium
(co-sponsored with Brandeis Univ.)
Where Chemistry Meets Art and Archaeology
9:00 AM Opening
9:15 AM Dr. Walter McCrone (McCrone
Research Inst.)
"Authenticating Paintings: The Shroud of Turin"
10:15 AM Prof. Joseph Lambert (Northwestern
Univ.)
"Organic Materials as Archaeological Artifacts"
11:30 AM Prof. Nikolaus van der Merwe
(Harvard Univ.)
"Archeometry, Prehistoric Diets via Isotope
Analysis"
1:30 PM Dr. Barbara Berrie (Nat'l. Gallery of
Art)
"Art and Chemistry: Two Ways of Seeing"
3:00 PM Prof. R. J. H. Clark (Univ. College,
London)
"Raman Microscopy: Its Application to the
Identification of Pigments on Manuscripts,
Paintings and Other Artifacts"
4:00 PM Prof. Wilfred Arnold (Univ. Kansas
Med. Ctr.)
"Vincent van Gogh: Chemicals, Crises and
Creativity"
Wesleyan Univ., Middletown, CT
Science Auditorium, Science Ctr., Lawn Ave.
For information, call 860-685-2572

May 11

Prof. Graham Fleming (Univ. California,
Berkeley)
"Photosynthetic Light Harvesting"
Mass. Inst. of Tech.
Bldg. 4, Rm. 270, 5 PM
May 18
Prof. Stanley Opella (Univ. Pennsylvania)
"NMR Spectroscopy and Functional Genomics"
Mass. Inst. of Tech.
Bldg. 6, Rm.120, 4 PM

May 19

Graduate Research Symposium
Mass. Inst. of Tech.
Time and Place TBA

May 25

Prof. Jay Siegel (Univ. California, San Diego)
Title TBA
Mass. Inst. Technol.
Bldg. 6, Rm. 120, 4 PM
Prof. Carol A. Bessel (Villanova Univ.)

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