

# THE NUCLEUS

October 1991

Of the Northeastern Section of the American Chemical Society

Vol. LXX, No. 1

## October 17 Meeting

*Nobel Laureate Evening*

## October 24 Meeting

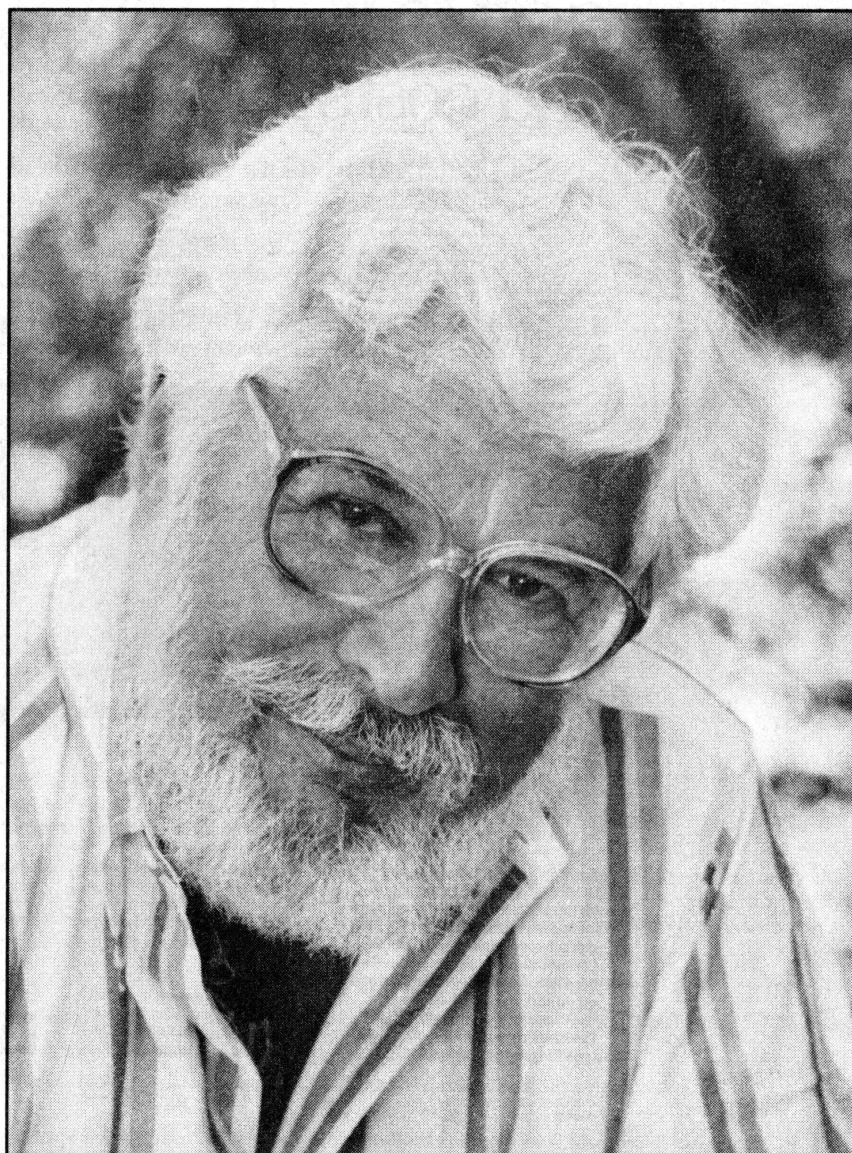
*Henry A. Hill Award;  
B.J. Luberoff speaks on  
Managing and Being Managed*

## Student Night

*1991 Awards to  
Students and Teachers*

## Health and Safety

*ACS Safety Videos*



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<b>Deadlines:</b> December issue: October 23	

## THE NUCLEUS

Dedicated to the Memory of James Flack Norris  
Published monthly from October to May by the Northeastern Section of the American Chemical Society, Inc.



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 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.

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# Proposed Amendments of the Constitution and Bylaws

The Board of Directors at its May 9, 1991 meeting approved the following amendments to the Constitution and Bylaws. The first amendment seeks to be more specific for filling vacancies in the position of Alternate Councilors and to document the method which has been used in the past. The second set of amendments is for removing gender-specific language from the current documents without introducing any substantive changes. According to Article XX and Bylaw X these amendments can be voted at any meeting of the Section which takes place at least 30 days after publication of the proposed amendments. To be voted at the November 7 Meeting.

*Deletions are in brackets [ ], additions are underlined.*

## Article VIII Elections

Sec. 6: In the event of a vacancy occurring in any elective position, the Board of Directors shall promptly elect a successor from candidates chosen by the Nominating Committee, except that vacancies occurring in the list of Councilors shall be filled by the Board of Directors for the remainder of the term from the list of Alternate Councilors, and that vacancies occurring in the list of Alternate Councilors shall be filled by the Board of Directors for the remainder of the term from the list of unsuccessful candidates for that position in decreasing order of number of votes received in the most recent election. All candidates shall be MEMBERS of the Northeastern Section. Except for Councilors and Alternate Councilors [S]such election shall be only for a term which extends until a successor can be elected as provided in this Article.

## Article V - Officers and Duties

Sec. 3. The Chairman-Elect shall per-

form the usual duties of Vice-Chairman and shall succeed to the Chairmanship either at the expiration of the Chairman's term of office or to fill a vacancy in the office of Chairman [occurring during his term of office as Chairman-Elect].

## Bylaw III - Boards and Committees

Sec. 13. (a) The chairman of each standing committee shall prepare for presentation at the Annual Meeting of the Board of Directors a written report of the activities of [his] that committee and of any subcommittees responsible to it, including a financial statement. A summary of this report shall be read at said meeting and, on approval by the Board of Directors, shall be published in the Official Publication of the Northeastern Section.

(b) The chairman of each standing committee shall deliver to the Secretary of the Northeastern Section the recommendations of said committee to the succeeding committee. [When] The Secretary shall deliver this report to the chairman of the succeeding committee [has been appointed, the Secretary shall deliver this report to him].

## Bylaw V - Awarding the Theodore William Richards Medal and Award

Sec. 7. The Committee shall ordinarily report in writing to the Board of Directors at its February meeting, but in any case not less than six weeks before the medal is to be awarded, the name of the recipient and a brief statement of [his] the recipient's conspicuous achievement in chemistry, together with an estimate of the amount of money needed to make the award.

Sec 10. In addition to the gold medal and the silver duplicate medal, the recipient may be given a sum of money

at least sufficient to cover [his] the recipient's personal expenses in attending the meeting.

Sec. 12. The recipient shall appear in person to receive the medal and deliver an address or read a paper about [his] the work for which the medal is awarded.

## Bylaw VI - Awarding the James Flack Norris Award

Sec. 8. The Committee shall ordinarily report in writing to the Board of Directors, not less than six weeks before the Award is to be made, the name of the Award recipient and a brief statement of [his] the recipient's outstanding achievements in the teaching of chemistry together with an estimate of the amount of money needed to make the Award. The Board of Directors shall authorize the payment of the amount of money it considers appropriate for the Award and necessary for the arrangements for the Award but shall not commit for payment a sum larger than the money then available in the income account of the Norris Award Fund. (Dec. 1982) ◇

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# October 17 Meeting

*The 736th Meeting of the Northeastern Section of the American Chemical Society*

Thursday, October 17, 1991

Harvard University

## Nobel Laureate Evening

*Honoring Professors Konrad Block, Dudley Herschbach, William P. Lipscomb  
Honoring New Members, 50-Year Members*

**5:30** Social Hour, Harvard Faculty Club, 20 Quincy St., Cambridge

**6:30** Dinner, Harvard Faculty Club

**7:45** Evening Meeting, Science Lecture Hall B

Opening remarks and welcome to new members – S. Allen Heininger, President, ACS

Presentation to 50 year members – Charles E. Kolb, Jr.

*The Life and Work of Alfred Nobel* – Lisa Herschbach, Science Historian, Harvard University

Panel Discussion: *Science and Public Awareness* – Moderator: Katie Stygall. Panel: Nobel Laureates present, also S. Allen Heininger, Lisa Herschbach, invited science journalists.

Refreshments will be served after the program.

Dinner reservations should be made no later than October 11. Please call Mrs. Karen Piper at (508) 456-8622 or (800) 872-2054. Reservations not cancelled at least 24 hours in advance must be paid. Members, \$21.00; Non-members, \$23.00; Students and Retirees, \$8.00. New members and invited Fifty-Year Members, no charge. **THE PUBLIC IS INVITED.**

*The Norris Award for Excellence in Teaching will be given at the November 7 meeting at Boston College to Prof. John Moore, University of Wisconsin. Note the early date.*

# Imaginary Gardens and Real Toads

*From the talk given by Professor Dudley Herschbach, Harvard University, at Students' Night on May 9, 1991.*

Marianne Moore's definition of poetry (title, above) was used by Professor Herschbach to introduce his discussion of chemistry as a career and the teaching of chemistry as an art.

His own education was propelled by a high school chemistry course and the expectation of both teachers and coaches that he go on to college, an idea at odds with his previous background. He paid tribute to the best teacher he had, John Meischke, whose dramatic teaching stunts still are vivid in his memory.

Why is chemistry considered a difficult subject? Herschbach feels that chemistry is like impressionistic painting. If you stand too close to such a painting it is a meaningless mess, just dabs and globs of paint everywhere. It needs to be viewed from the right distance. (Monet needed to attach his brushes to long sticks so that he could see what he was painting from the right distance.)

The epistemology of chemistry is subtle. Physicists, who work from first principles, are puzzled by chemistry.

You can't talk electronegativity to a physicist; there are no first principles. There are different levels of abstraction to different aspects of chemistry, just as the right viewing distance may vary from one painting to the next. Students can learn to pick up clues to the right distance and need to realize that chemistry requires the same general alertness to context as social studies or the humanities.

There are two essential things that students should be told.

First, there is a tremendous advantage to the study of science. The goal is truth and understanding, and Nature waits patiently for you to find your route. It doesn't play tricks on you. In baseball, hockey, business, war—timing is all-important. Science waits.

In science you can make many mistakes but ultimately you come to a better view, get around the road blocks. Science places a premium on unorthodoxy, on people who look at things in a different way. Law or economics are much harder disciplines in Herschbach's estimation.

Second, science is congenial and collegial; everyone works for you. You build on what others have learned and done, you synthesize from the work of others. Science is more cooperation than competition. If you want competition you should find it in law or business.

Now, how does the chemistry teacher get this message across? Herschbach recommended a grading policy with two basic principles. One, no competition between students. Two, No loss of points in an hour exam.

He sets up an absolute scale so that the student competes with him, not with a fellow student. This allows him the opportunity of assigning teams to problems such as analyzing the chemical kinetics of beer drinking. By teaching someone else you yourself learn.

In the hour exam you get credit for the points you earn, but lose no points because you can resurrect them in the final exam. In high jumping the record jumps come on the third try, ascribed to the adrenalin factor. So in science.

*(continued on page 13)*

# Student Night, May 9, 1991

## Awards Dinner

### THE PHILIP L. LEVINS MEMORIAL PRIZE

Jeffrey R. Mazzeo Northeastern University  
Keith DeVries Harvard University

### 1991 UNDERGRADUATE RESEARCH SCHOLARS JAMES FLACK NORRIS SCHOLARS

*Simmons College*  
Linda R. Wolf Prof. Louis Irwin  
*University of Massachusetts - Boston*  
Annette MacDonald Prof. Marietta Schwartz  
*Boston University*  
Thomas D. Clark Prof. James S. Panek

### THEODORE WILLIAM RICHARDS SCHOLARS

*St. Anselm College*  
Melissa A. Walker Prof. George Parodi  
*Keene State College*  
Richard Woudenberg Prof. Jerry P. Sasinski

### THE THEODORE WILLIAM RICHARDS AWARD FOR EXCELLENCE IN TEACHING OF SECONDARY SCHOOL CHEMISTRY

David J. Olney Lexington High School  
Catherine F. Krueger Bedford High School

### AULA LAUDIS SOCIETY

Fred Richardson Belmont Hill School, Retired  
Katherine Skelly Dana Hall School  
Anne Marie Ladetto Dartmouth High School  
Stephen Lantos Brookline High School  
Catherine Krueger Bedford High School

### THE LYMAN C. NEWELL GRANTS

Lisa C. Anderson Barnstable High School  
Candace Pontbriant St. Columbkille High School  
Renee Zimmerman St. John's Preparatory School

### WINNERS of the THIRTY-THIRD ANNUAL AVERY A. ASHDOWN HIGH SCHOOL EXAMINATION CONTEST

STUDENT	SCHOOL	TEACHER
<b>First Prize - The Simmons College Award</b>		
David A. Holland	Wayland High School	Ms. Jacqueline Arendt
<b>Second Prize</b>		
Jon A.G. Auerbach	St. Paul's School	Mr. Peter B. Tuttle
<b>Third Prize</b>		
Eric S. Tentarelli	Philips Academy	Mrs. Cristina Kerekes
<b>Fourth Prize</b>		
Alongkrit Chutinan	Philips Academy	Ms. Leslie Ballard
<b>Fifth Prize</b>		
Patrick J. Neschleba	Acton Boxborough Regional High School	Ms. Carol Murphree

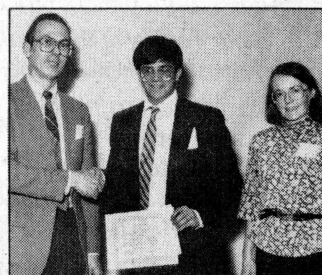
### 1991 Ashdown Examination Contest

Dr. James Piper presenting First Prize Award (Simmons College Award) to David A. Holland of Wayland High School, his teacher, Ms. Jacqueline Arendt on the right.



### 1991 T.W. Richards Awards

for Excellence in Teaching of Secondary School Chemistry being presented by Dr. Irwin Taub to David J. Olney, Lexington High School (above right) and to Catherine F. Krueger, Bedford High School (above left).



STUDENT	SCHOOL	TEACHER
<b>HONORABLE MENTION - FIRST YEAR</b>		
Peter X. Bellini	Lexington High School	Mr. David Olney
Brian M. Gordon	Newton South High School	Mrs. Joyce Leary
Jason Woodward	St. Paul's School	Mr. Clifford Gillespie
Andrew M. Wolf	Lexington High School	Mrs. Judith Masselam
Luke D. Burns	Wellesley High School	Mrs. Mary Crosson
Benjamin D. Mazzotta	Newton South High School	Mrs. Joyce Leary
<b>HONORABLE MENTION - SECOND YEAR</b>		
Virginia A. Triant	Winsor School	Mrs. Anne O'Meara
David Foti	Wayland High School	Mrs. Jacqueline Arendt
Rebecca J. Stetz	Lexington High School	Mr. David Olney
Raymond Shu	Philips Academy	Mr. Temba Maqubela
Jeremy L. Baryza	Newton North High School	Mr. D. Montgomery Wells
Jeffrey Cabral	Dartmouth High School	Mrs. Ann Marie Ladetto
Eric L. Gauthier	Duxbury High School	Mrs. Margaret O'Brien
Matthew w. Stewart	Duxbury High School	Mrs. Margaret O'Brien
Yu-Harn Chen	Winchester High School	Mr. William J.R. Marks

# Professional Relations Meeting

## The Henry A. Hill Award

The 737th Meeting of the Northeastern Section of the American Chemical Society

Thursday, October 24, 1991

### On Managing and Being Managed

Simmons College, 300 The Fenway, Boston, MA  
All activities will take place in the Main College Building

- 5:30** Social Hour, Special Functions Room  
**6:15** Dinner, Fens Dining Room  
**7:30** Presentation of the Henry A. Hill Award to Valerie A. Wilcox  
The Henry A. Hill Awards – William O. Foye  
Henry A. Hill Reminiscences – Janet Perkins  
Introduction of the Award Recipient – Esther A. H. Hopkins  
Presentation of the Award – Charles E. Kolb, Jr.  
**8:00** Lecture, Room C 103, *On Managing and Being Managed* – Benjamin J. Luberoff, Editor, *Chemtech*.

Refreshments will be served after the program.

Dinner reservations should be made no later than October 18. Please call Mrs. Karen Piper at (508) 456-8622 or (800) 872-2054 (MA or NH). Reservations not cancelled at least 24 hours in advance must be paid. Members, \$21.00; Non-members, \$23.00; Students and Retirees, \$8.00. THE PUBLIC IS INVITED.

## National Chemistry Week

### I. The Public is Invited

- November 7, Boston College**, Norris Award Meeting honoring Prof. John C. Moore.
- November 8, Framingham State College**, Hemenway 309, 7:15 p.m. *Healthy Eating - Delicious Healthy Eating* Dr. Fred Shank, Director, Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administration and Lisa Schram, Dietitian at Beth Israel Hospital. Lecture, panel discussion, question and answer period. Panel members also include members of the Institute for Food Science, Technology and Nutritional Biochemistry, Framingham State College. *Healthy and delicious refreshments follow. Invite your friends and neighbors!*

### II. Happenings for Education

- Annual High School Symposium, November 6, Museum of Science, Boston**  
*Oil and Energy*, open to high school teachers and selected students. For information call Karen Piper (800) 872-2054 or (508) 456-8622.
- Science Teaching Day, November 2, Boston University**  
Information will be mailed to teachers.

## Member News

Dr. Edward Atkinson, contributing editor to the *NUCLEUS* (History of Chemistry) recently lost his wife Lorraine after a long illness. Our sympathy goes out to you Ed.

Dr. Jerry Bell, Simmons College, spent the summer writing a text for *Microscale Introductory Chemistry: Chemical Exploration*.

Drs. Peter Bowers and Leonard Soltzberg, Simmons College, attended the Gordon Conference on Oscillation Reactions (phenomena far from equilibrium).

Beth Duston, Chairman of the NESACS Legislative Affairs Committee, has been an organizer and invited member of the White House Conference on Library and Information Services in July which has as its task to set library and information services policy for the next decade.

Dr. William Foye, Mass. College of Pharmacy and Allied Health Sciences and Chairman of the NESACS Awards Committee is the 1992 recipient of the Rho Chi Lecture Award, to be given at the Annual Meeting in San Diego, CA in March, 1992. Congratulations!

Please keep Member News Coming ◇

## Biography

Benjamin J. Luberoff, President of The Concept Team, Inc. has finally seen the light; he is living in California...half time. From San Mateo (and New Jersey) he provides Knowledge Services to clients, the most visible of which is as Editor of the 20 year old ACS Polydisciplinary magazine, *CHEMTECH*. Prior to founding *CHEMTECH* Ben managed the R&D entity at Lummus Stauffer and American Cyanamid Companies. He has also headed technical continuing education at Rutgers and taught at his Alma Maters, the Cooper Union and Columbia. His publications encompass process design, catalysis, analysis and the management of innovation.

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## Health and Safety

on My Mind

### Introduction to Chemical Laboratory Safety

by M.A. Solstad

If you're a laboratory chemist, you probably have been dismayed at the paucity of audio-visual training materials available that address the special safety problems of bench chemists. Now there is a solution. The continuing education department of ACS has developed a four-video training course on laboratory procedures, with manual. If it's been years since you graduated from a university with a strong safety program, and you have any responsibility for supervising other chemists, I suggest you arrange to buy, rent or beg a copy.

The production is first rate, if not inspired, and the content includes input of many reviewers, chemists from industry, academia, from CHAS and the ACS Council Committee on Chemical Safety and industrial hygienists.

#### I Introduction to Chemical Safety

After a slapstick — everything done wrong — introduction, the importance of working safely, not only for yourself, but for your co-workers, the environment and the chemical plant workers, is explained. Sources of information, such as MSDS's, are mentioned, then there is an introduction to the hazard classifications of *Toxicity, Corrosivity, Flammability and Reactivity*. Each hazard type is covered in four to six minutes. The segment concludes with the admonition: Be informed. Don't learn safety by accident.

#### II Protection Against the Odds

A crap table scene leads into four steps to increase your odds of working safely. In priority order they are: [1] Eliminate or reduce hazard, e.g. substitute

## Symposium on Chemistry in Electronics

Presented by the Northeastern Section Committee on Continuing Education

Saturday, Nov. 23, 1991, Northeastern University, 360 Huntington Ave., Boston, MA, Room 224 Hurtig Hall

It is not generally recognized that the computer industry requires sophisticated chemistry for the manufacture of components. The symposium is intended to show non-specialists how deeply chemistry is involved in the fabrication of high-tech products.

#### Program:

8:30 - 8:55 a.m.	Registration and Coffee
8:55	Opening Remarks
9:00	How Chemistry Helps to Make Computers Gary S. Calabrese, Shipley Co., Marlborough, MA A discussion of the chemistry of photoresists and how they are used in the computer industry.
	Coffee Break
10:00	Plasma Chemistry in Microelectronic Processing: Chemical Vapor Deposition (CVD) and Reactive Ion Etching (RIE) Mark Horn, MIT Lincoln Labs, Lexington, MA Mark Hartney, MIT Lincoln Labs, Lexington, MA A description of CVD and RIE and of their utilization in microelectronics manufacture.
10:30	Lunch: A cold Deli-Buffer will be provided.
12:00	The Printed Circuit Board Manufacture Process Oleh B. Dutkewych, Shipley Co., Marlborough, MA A description of the printed circuit process with emphasis on the electroless deposition of copper.
1:00	Analytical Chemistry Support for Microelectronics Robert Cembrole, Digital Electronics Co., Northborough, MA A description of case studies which illustrate how analytical chemistry supports microelectronics technology.
2:00	Closing Remarks

#### Registration Fees:

General admission:	A.C.S. Members .....	\$60.00
	non-A.C.S. Members .....	\$75.00
Retirees, Students, High School Teachers.....		\$10.00
High School students accompanied by their teacher.....		free

For further information contact: Prof. Alfred Viola - (617) 437 2809

#### Advanced Registration Required by Nov. 12, 1991 - use form below:

Registration form for SYMPOSIUM ON CHEMISTRY IN ELECTRONICS

Name: \_\_\_\_\_ Tel.: \_\_\_\_\_

Address: \_\_\_\_\_

Mail with remittance to: Prof. Alfred Viola, Chair  
NESACS Continuing Education Committee  
Department of Chemistry, Northeastern University  
Boston, MA 02115

(continued on page 12)

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## Historical Notes

by Edward R. Atkinson, Amherst, MA

The past few issues of our column have included only obituaries. In an effort to lighten the tone of our discourse we present a story that appeared in the *New York Times* so many years ago that most of our readers have long forgotten it.

In the weekly "Science Times" column an article "Is Problem-Solving America's Lost Art?" led Professor Reinhold Benesch of Columbia to report the following in a piece entitled "The Old Shell Game".

"In the early 40's I succeeded in making hens lay eggs without shells by feeding them a drug which inhibits production of carbonic anhydrase, an enzyme. This enzyme converts carbon dioxide to carbonate in the shell gland, making it possible for the chick to emerge in a hard shell of calcium carbonate. The experiment was done in

England in the middle of World War II and gave rise to a poem in the October issue of *Punch*. The last stanza went:

And you, O'hen, when first you gaze  
Aghast on this unwanted sight  
Forbear to squawl your wild amaze,  
Believe me, you're all right.  
And when again that broody fit  
Compels a long retirement, then  
Unless I'm wrong, you ought to sit  
More comfortably, hen.

"The shell-less experiment led to many amusing sequelae, but none more instructive than the occasion when a business man who made his living by collecting newly molted, i.e., soft-shelled, crayfish and shipping them all over the United States as bait came to consult me.

"Since he had heard of my shell-less eggs, he wanted to know how he could delay the hardening, i.e., calcification, of his crayfish as long as possible to preserve their usefulness as bait. I suggested various inhibitors of calcification, all of which he promptly rejected as far too expensive for his operation, and on this discouraging note we parted.

"Quite a while after that we met again and, of course, I wanted to know if he had ever succeeded in keeping his crayfish soft. When he cheerfully replied in the affirmative, I asked him how he had done it (with what drug, etc.). "Oh no," he said, "all I did was to keep them in distilled water instead of tap water, which is full of calcium."

"Ah, common sense, even in science." ♦

The ACS is at a critical juncture in its long and distinguished history. We need a continuing succession of leaders to implement the Society's well developed strategies and to influence government and industry in the areas of support for emerging technologies, public education, and education of our youth. We also need to address Society issues such as career opportunities for chemists, communication with the membership, and international cooperation.

Most importantly we must have an active membership. I am particularly concerned that our leadership is often determined by a vote of only 20% of our members. I therefore urge you to cast your ballot for President-Elect of the ACS.

Sincerely,

*Hank Whalen*

Hank Whalen

Candidate for 1992 President-Elect, ACS

*This ad is paid for by friends of Hank Whalen*

## Councilors' Report

Atlanta, April 17, 1991

Action	Becker*	Billo*	Chen	Costello	Gilbert	Heyn	Hopkins	Light	Neumeyer	Perkins	Viola*	Council
Constitutional Amendment to delay until next Council meeting the final vote on an amended petition.	Y	N	N	Y	Y	N	N	Y	N	Y	Y	N
Dues Increase for 1992 (\$5 increase to \$91)	Y	Y	Y	Y	A	Y	Y	Y	Y	Y	A	Y
Removal of Gender-Specific terms from Constitution and By-Laws	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

A=abstained,

\*Alternate Councilor

New York, August 28, 1991

Action	Becker*	Chen	Gilbert	Gleekman*	Heyn	Hopkins	Light	Perkins	Samuel*	Council
Limitation of Councilor Terms										
Recommittal	N	N		N	N	N	N	N	N	N
Main Motion	N	N	N	N	N	N	N	A	N	N
Establ. Int'l Chem. Sci. Chapters										
Antidiscriminat. Amendment		Y	Y	Y	Y	Y	Y	Y	Y	Y
Recommittal	N	N	N	N	N	N	N	N	N	N
Main Motion	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Comm. on Econ. Status to be Standg. Comm.										
Recommittal	Y	N	N	N	N	N	N	N	N	N
Main Motion	N	Y	Y	Y	Y	N	N	Y	Y	N
Dues Escalator Provisions										
Allow above or below escal. amt. + 1/2 vote	N	N	N	N	N	Y	N	N	N	N
Allow above or below escal. amt. + 1/3										
Urgent Action	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Main Motion	Y	N	N	Y	N	Y	N	Y	N	N



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## Health & Safety

continued from page 9

toluene for benzene. [2] Use engineering controls such as fume hoods or high temperature cut-offs. [3] Use administrative controls, such as special rules or training for working with particularly reactive chemicals. [4] Use personal protective equipment, from lab coat to appropriate gloves and eye protection. Important factors that are illustrated for fume hoods are flow rate and sash position and using them correctly.

### III Safe Laboratory Procedures

A nightmare scene of a lab accident leads into the third, and perhaps most useful film: Safe methods are shown for standard lab procedures such as [1] working with glassware, [2] transferring chemicals, [3] heating reactions, [4] cryogenics, [5] compressed gases, [6] emergency procedures, [7] waste disposal, and [8] chemical spills.

### IV Government Regulations

OSHA and EPA regulations that apply to laboratories are covered. This may

not become your favorite among the four films, but it contains important material for laboratory supervisors and workers, and viewing it is a whole lot easier than studying the CFR, or Code of Federal Regulations.

The accompanying manual, in the unfinished version I saw, is a B-, while the films are A to B+ in this reviewer's estimation. The manual is being re-edited now. The accompanying appendices include a glossary, lists of OSHA PEL's, regulated carcinogens, flammable liquids, reactive chemicals, peroxidizing chemicals, incompatible chemicals, overview of Federal Regulations, local rules, bibliography and sample exam.

*Introduction to Chemical Laboratory Safety* by the American Chemical Society, a four video tape course of about one half hour each, with accompanying manual, (4 copies), and a copy of each existing ACS booklet on chemical safety and laboratory regulations. Available in October, 1991, for \$1950. Single tapes will also be available. Call ACS for pricing information. ◇

## Imaginary Gardens

continued from page 5

Pursuit of science (or almost anything worthwhile) is not a series of one shot trials.

You don't have to be right all the time; it is not even desirable. "Silly ideas" may make progress. Truth waits patiently. It is the sustained effort that leads to the advances.

Freshman courses have captive audiences. Often there is a marvelous transformation of the nature of science in the student's mind between the fall of the freshman year and the spring of the senior year.

Another lesson Professor Herschbach stressed: you don't need to do everything very well. He cited distinguished colleagues who cannot solve quadratic equations. The comparison with the musician is fruitful. Yoyo Ma was taught by his father by the technique of being allowed to play only a single measure a day when he was studying a piece of music. In science you can play 99% of the notes wrong

but when you play one right there is tremendous applause. Even the baseball pitcher whose contract gives him a rate of \$2000 per pitch doesn't need to pitch a strike every time.

The landscape of science is fantastic, with many, many places to explore. Find a place where your talent and temperament mesh.

Enzymes keep us going; they keep bumping around among the molecules until they finally find the molecule they were destined to catalyze, and wow! So it is with humans. There are the basketball players with the last second winning shot and the subsequent high fives. This is a case of short interaction and high sincerity. Then there is the politician with the politician's handshake, as example of long interaction and low sincerity! This is quantum mechanics at the human level.

Professor Herschbach ended with a brief light-hearted sports-oriented review of the molecular collision research which led to his sharing the 1986 Nobel Prize in Chemistry.

Reported by M.S.Simon ◇

## The Boston College University Lecture Series in Chemistry

The Boston College University Lecture Series in Chemistry to be given by Harden M. McConnell, Robert Eckles Swain Professor of Chemistry at Stanford University. The titles of Prof. McConnell's lectures are:

### The Silicon Microphysiometer --

A New Tool for The Chemist

(Oct. 16th at 4:30PM)

### Long-Range Forces in Monomolecular Films

(Oct. 17th at 8 PM)

### Physical Chemistry of Immune Recognition --


Class II MHC Molecules

(Oct. 18th at 4:30 PM)

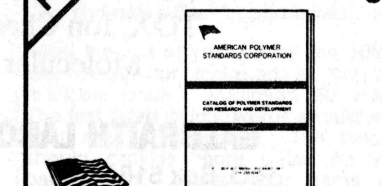
All lectures to be held in the Chemistry Center, Room 127. The Chemistry Center is located on 2609 Beacon Street, Newton. Parking is available at the Stadium Parking which is next to the Chemistry Center. For further information please contact the chemistry departmental office at: (617) 552-3606.

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## Book Review

by Ernest I. Becker

*On Being a Scientist*, Committee on the Conduct of Science of the National Academy of Sciences, National Academy Press, Washington, D.C. 20418, 1989. Price: 1 copy, \$5.00; 2-9, \$4.00 each; 10 or more, \$2.50 each.

For some time now I have been looking for work which would treat such topics as the ethos of the scientific enterprise, ethics in science, the role of the scientist in society, and related topics which are appearing frequently in the daily press and broadcast news stories. The book would have to be brief for I wanted to use it as a supplement in any of the courses I taught. I believe I have now found that text.

*On Being a Scientist*, with a pref-

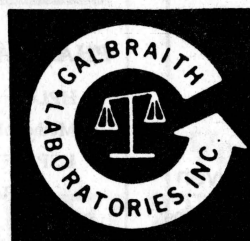
ace by Frank Press, was written under the auspices of the Committee on the Conduct of Science of the NAS. Although it is only 22 pages long, it elaborates three topics: "The Nature of Scientific Research", "Social Mechanisms in Science", and "The Scientist in Society". The authors dig deeply into the issues which contribute to the nature of the scientific method; human error in science, fraud and plagiarism; and finally, into the obligation of the scientist to society. The text is readable, plausible, and appealing to that rare commodity - common sense.

One highlight is the admonition that scientists must make an effort to think about the applications of their research, "...recognize the potential for

such discoveries and be prepared to address the questions that they raise." Translated, this statement says that studying and practicing science alone is not enough; thought must also be given on how the outcome of one's research will impact on society. Aside from understanding the implications of one's work and, perhaps, explaining it to others, a very difficult question is just what can one do if others use the results of one's work inappropriately.

This book is readily understood by the layman, but I recommend it most to those high school students who are contemplating careers in engineering, the natural sciences, or mathematics, and to faculty, to discuss these issues in their classes.

The question of what to do about these issues when they threaten to impact one's own employment is not dealt with nor was the booklet designed to do so. ◇



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## Medicinal Chemistry Group

1991 officers for the Medicinal Chemistry Group of the Northeastern Section are:

**Chairman:** Mark Froimowitz  
(McLean Hospital)

**Past Chairman:** James Weinberg  
(T Cell Diagnostics)

**Program  
Chairman:** Patrick Gordon  
(Organix, Inc.)

**Secretary:** Gerald Jones  
(Northeastern Univ.)

**Treasurer:** Laxma Reddy  
(Cambridge Neuroscience)

*The Medicinal Chemistry Group gratefully acknowledges 1990 contributions toward our program of seminars and symposia from Hoechst Roussel Pharmaceuticals, Pfizer, Inc., and Smith-Kline Beecham Pharmaceuticals. ◇*

## Educational Task Force

### Statement of Purpose

The Educational Task Force of the Northeastern Section of the American Chemical Society (NESACS) proposes to develop a science outreach program aimed at elementary school children, grades 4-6. The goals of this program are

- To enrich the elementary school curriculum through demonstrations, participatory student activities, and interaction with scientists;
- To foster career in science by providing role models of scientists and engineers to elementary school children in the classroom.

To fulfill the first goal, the program will be structured around a series of demonstrations on topics designed to fit into the science curriculum in grades 4-6. We want to involve teachers as much as possible by providing supplemental materials and by encouraging feedback with NESACS.

To fulfill the second goal, we will draw on the membership of NESACS.

## ACS News Acid Rain

Before the past decade, "acid rain" was a term used only by environmental scientists to describe their relatively unnoticed work in measuring the constituents of precipitation and the resulting effects on the environment. Today the public perceives acid rain as an environmental threat, one that has brought differing opinions from the scientific community. Through recent research, a clearer understanding has emerged about (1) the process by which oxides of sulfur and nitrogen are transformed in the atmosphere into acids, (2) the transportation of air pollutants over long distances, and (3) the process by which acid rain enters watersheds and constitutes acidification which affects fish and other aquatic organisms. But an element of ambiguity remains. The major uncertainties associated with acid rain include the interaction of it and its precursors with other air pollutants; the effects of acid deposition on trees and soil, materials, and human health; and the degree to which control of emissions to the atmosphere will reduce acid deposition. This eight-page information pamphlet describes what is known and not known about this environmental issue.

Single copies are available free of charge (up to 10 for non-profit groups) from the ACS Department of Government Regulations and Science Policy, 1155 Sixteenth Street, NW, Washington, DC 20036. Please include a self-addressed mailing label. For multiple copies, please call (202) 872-8725. ◇

Meeting this goal means encouraging classroom interactions among scientists, teachers, and students. Furthermore, we recognize the importance of providing female and minority scientists as role models since these groups are under-represented in science and engineering. ◇

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### FREE CAREER OPPORTUNITY ADS

Unemployed NES members may get a free classified ad in *THE NUCLEUS* to help find new career opportunities.

Send the text of your ad by the 10th of any month for inclusion in the next available issue. Maximum 50 words. The first three to four words should state your area of expertise. The balance should provide more detail on your background. Place your name and phone number last. Send your ad to:

**Karen Piper**  
c/o Northeastern Section Office  
19 Mill Road  
Harvard MA 01451

# Calendar

## For additional information, call:

Boston College – (617)552-3606  
Clark University – (508)793-7116  
MIT – (617)253-4080  
Northeastern University – (617)437-2822  
Tufts University – (617) 381-3441  
UMass Dartmouth – (508)999-8232  
University of New Hampshire –  
(603)862-1550

## Tuesday, Oct 1

Dr. Steven A. Carr (SmithKline Beecham Pharmaceuticals)  
“Recent Innovations in the Mass Spectrometry of Recombinant Proteins”  
Northeastern University  
Hurtig Hall, Room 129 at 4:00 pm

## Wednesday, Oct 2

Dr. Stuart Novick (Wesleyan University)  
“The Nature of the Non-Chemical Bond: Two Decades of Study of van der Waals Molecules”  
UMass Dartmouth (formerly Southeastern Massachusetts University)  
Science and Engineering Building (Group II) Room 305 at 4:00 pm

## Thursday, Oct 3

Prof. James Farrar (Univ. of Rochester)  
“Dynamics of Ion-Neutral Interactions: Collisions and Complexes”  
Boston College  
Gasson Hall, Room 305 at 4:00 pm

## Monday, Oct 7

Dr. Hao Sun (Sterling Drug Inc.)  
“Antitumor and Antifungal Indole Alkaloids from Marine Sponges”  
Clark University  
Sackler Science Building,  
Room N-105 at 4:00 pm

## Thursday, Oct 10

Prof. John Frost (Purdue University)  
Title to be announced  
MIT, Room 6-120 at 4:00 pm

## Tuesday, Oct 15

Prof. Joseph L. Knee (Wesleyan Univ.)  
“Picosecond Laser Photoelectron Spectroscopy”  
Northeastern University  
Hurtig Hall, Room 129 at 4:00 pm

## Wednesday, Oct 16

Dr. Gregory Petsko (Brandeis University)  
“On the Origin of Enzymatic Species”  
UMass Dartmouth  
Science and Engineering Building (Group II), Room 305 at 4:00 pm

Prof. Harden M. McConnell (Stanford U.)  
“The Silicon Microphysiometer – A New Tool for the Chemist”  
Boston College  
Gasson Hall, Room 305 at 4:00 pm

## Thursday, Oct 17

Prof. Harden M. McConnell (Stanford U.)  
“Long-Range Forces in Monomolecular Films”  
Boston College  
Gasson Hall, Room 305 at 4:00 pm

Prof. Robert Armstrong (UCLA)  
Title to be announced  
MIT, Room 6-120 at 4:00 pm

Prof. Harry Allcock (Penn State)  
“Polymer Synthesis at the Boundary of Biology and Solid State Science”  
University of New Hampshire  
Parsons Hall, Iddles Auditorium,  
Room L-103 at 11:00 am

## Friday, Oct 18

Prof. Harden M. McConnell (Stanford U.)  
“Physical Chemistry of Immune Recognition – Class 11 MHC Molecules”  
Boston College  
Gasson Hall, Room 305 at 4:00 pm

## Tuesday, Oct 22

Dr. Michael Carrabba (EIC Laboratories)  
“State of the Art Application of Raman Spectroscopy: Techniques and Instrumentation”  
Tufts University (Medford Campus)  
Pearson Laboratory, Room 104 at 4:30 pm

## Wednesday, Oct 23

Dr. Kenneth Miller (Rensselaer Polytechnic Institute)  
“Computer Graphics and Molecular Modelling of Carcinogens and Antitumor Agents Interacting with DNA”  
UMass Dartmouth  
Science and Engineering Building,  
Room 305 at 4:00 pm

## Thursday, Oct 24

Prof. Russell P. Hughes (Dartmouth Coll.)  
“Making and Breaking of Carbon-Carbon Bonds at Transition Metal Centers”  
University of New Hampshire  
Parsons Hall, Iddles Auditorium,  
Room L-103 at 11:00 am

## Tuesday, Oct 29

Prof. Paul M. Gallop (Harvard Med Sch)  
“Biological Interconversion of Dioxide and Superoxide by the PQQ Coenzyme”  
Tufts University (Medford Campus)  
Pearson Laboratory, Room 104 at 4:30 pm

## Wednesday, Oct 30

Dr. Willem Leenstra (Univ. of Vermont)  
“Bilirubin Secondary Structure Investigated by Spectroscopic and Computational Studies”  
UMass Dartmouth  
Science and Engineering Building (Group II), Room 305 at 4:00 pm

## Thursday, Oct 31

Prof. David G.I. Kingston (Virginia Polytechnic Inst. and State Univ.)  
“Studies of Antitumor Activity of Taxol at the Molecular Level”  
Northeastern University  
Hurtig Hall, Room 129 at 4:00 pm

## Notices for the Nucleus Calendar should be sent to:

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