

# THE NUCLEUS

October 1988

Of the Northeastern Section of the American Chemical Society

Vol. LXVII, No. 1

## Monthly Meeting:

*The Chemist as Entrepreneur*

## Election Results

## The Planning Workshop

*A report by Chair-Elect M. Strem*

## Exponential Dilutions

*Mystery Resurfaces*



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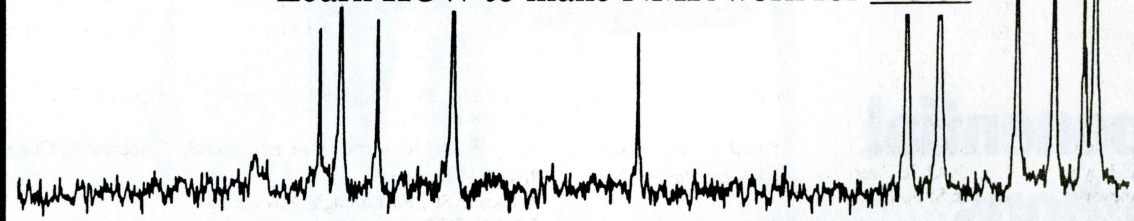
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**Cover:** Reen Gibb of Brookline High School with her student Lev Gelb, who received the first place Simmons College Award in the 1988 Ashdown High School Examination Contest

**November Issue Deadline:** September 20, 1988

## 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.*

**Editor:** Adrienne S. Dey, P.O. Box 453, Buzzards Bay, MA 02532;  
Tel. 508-759-4617

**Board of Publications:** Harry W. Orf (Chairman), Jean Vnenchak, Catherine E. Costello

**Business Manager:** Russell F. McCann  
10 Bassett St., Foxborough, MA 02035  
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**Advertising Manager:** Vincent J. Gale, 56 Bartlett Island Way, Marshfield, MA 02050;  
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**Circulation Manager:** Mark A. Druy, 88 Park Ave., Apt. 202, Arlington, MA 02174.  
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**Proofreaders:** Arno H.A. Heyn, Donald Rickter

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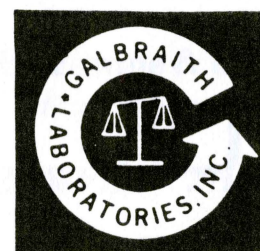
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## Election Results

The following is the result of the balloting for the 1989 ACS officers of the Northeastern Section. There were a total of 686 ballots counted (678 last year). The \* indicates the winner(s) in each category.

### CHAIRMAN-ELECT

\*E. Joseph Billo 586

### TRUSTEE

Myron S. Simon 301  
\*John L. Neumeyer 321

### TREASURER

\*James U. Piper 531

### COUNCILOR/ ALTERNATE COUNCILOR

(1st 4 highest = Councilor; next 4 highest = Alternate Councilor)

Martin Idelson 190  
James Quick 272  
\*Emily Dudek (Alternate) 317  
\*Janet Perkins (Councilor) 335  
Jean A. Stanley 195  
\*Catherine E. Costello (Councilor) 368  
Judith A. Kelley 215  
\*Esther A.H. Hopkins (Councilor) 336  
\*Truman S. Light (Councilor) 383  
Mary Ann Solstad 299  
Charles I. Sullivan 178  
\*Valerie A. Wilcox (Alternate) 316  
Mark A. Druy 244  
\*Lloyd D. Taylor (Alternate) 315  
\*Patricia L. Samuel (Alternate) 333  
William E. Adams 283

### NOMINATING COMMITTEE

\*Michaeline F. Chen 332  
Kay Denise Onan 223  
Arlene Wick Light 190  
\*Peter C. Meltzer 305  
Donald J. Ciappenelli 146

### JAMES FLACK NORRIS AWARD COMMITTEE

Thomas Greenbowe 232  
Frank L. Pilar 114  
\*David R. Haines 273  
Don B. Hilton 220  
\*Robert F. O'Malley 326

## October Meeting

The 710th Meeting of the  
Northeastern Section of the  
American Chemical Society.

Thursday, October 13, 1988

Henderson House, Weston, MA  
(See directions below. Notify Mrs. Piper if you need transportation.)

**5:30 p.m.** Social Hour

**6:15 p.m.** Dinner

**7:30 p.m.** Presentation of the Henry A. Hill Award to Esther A.H. Hopkins  
The Henry A. Hill Awards—William O. Foye  
Introduction of the Award Recipient—Lloyd D. Taylor  
Presentation of the Award—Thomas Gilbert

**8:00 p.m.** *The Chemist As Entrepreneur*

A Program Sponsored by the Committee on Professional Relations  
Does a market exist for what you want to sell? Also, some experiences of chemists who have gone into business for themselves as consultants, suppliers of research intermediates, or information specialists.

Speakers: Beth Duston, John Neumeyer, Jerome Reid, Stanley Rich. Their talks will be followed by a question and answer period moderated by Michael Strem.

Refreshments will be served after the program.

Dinner reservations must be made no later than October 7, 1988. Please call Mrs. Piper at (800)-872 2054 or (508)-456 8227. Reservations not cancelled at least 24 hours in advance must be paid. Members: \$15; Non-members, \$18; Students and Retired Chemists: \$5.00. THE PUBLIC IS INVITED.

## Directions to Henderson House

Henderson House is located in Weston, Massachusetts, just north of the Weston-Wellesley line. It is west of Route 128 and south of the Massachusetts Turnpike, between Routes 9 and 30.

**Going West on Route 30.** At the top of the hill, a little over a mile west of the intersection of Routes 128 and 30 and the Massachusetts Turnpike, take the hairpin left onto Oak Street. The street sign at the intersection says "Oak Street to Cliff Road." Follow the road one mile to a stop sign. Go straight through the intersection and 200 yards further on take the first right, onto

Westcliff Road. Follow Westcliff up the hill. Henderson House is on the right at the top.

**Going west on Route 9.** West of Route 128, immediately after Route 9 passes under Route 16, there is a GULF station on the right. Just past the GULF station, take a sharp right to Cliff Road, bearing right at the bottom of the exit ramp. Proceed about 1.2 miles and just past the Weston-Wellesley town line turn left next to the small pond onto Scotch Pine Road. Bear right on the curves and follow the signs to Henderson House which is on Westcliff Road on the left at the top of the hill. ◇

## Abstracts

*How Chemists Become  
Entrepreneurs: Starting Your  
Own Business, Or Should You?*

Myron S. Simon, Chairman,  
Committee on Professional Relations

The October meeting is devoted to the question of starting a business based on a chemical education and career. As more opportunities arise, more chemists are faced with the possibility of setting up their own shop. Since this is largely *terra incognita* to most of us, the Professional Relations Committee has brought together a group of people who can talk from their own experiences and training in a straightforward how-to-do-it way.

The first question that the would-be entrepreneur has to answer is, Is there really a market out there for what I want to sell? To answer that all-important question we will hear from Professor Stanley R. Rich of Venture Resource Associates, "Is There Really a Business Here?" He will focus on do-it-yourself methods of researching the market to find out if the new product or service satisfies a real need at a proper price and what are the potential benefits to the customer.

Beth Duston has built upon her training in chemistry and library science and experience as an information specialist at SUNY, Albany, and Aerodyne Research to found her company, Information Strategists. She had seen a need for specialized technical and marketing literature searches and for helping small research companies set up specialized libraries and data bases and has set out to fill these needs. Her talk is "Finding Your Market Niche".

John Neumeyer recognized a potential market for unique, pharmacologically interesting biochemicals from his vantage point as Professor of Medicinal Chemistry and Chemistry at Northeastern University. In 1980 he set up Research Biochemicals Incorporated to provide such materials to the research communities in pharmacology and neuroscience. He will describe the start and growth of this company which cur-

rently employs 19 people.

Jerome Reid built a successful career at Polaroid Corporation, but in 1985 decided to satisfy his longing to have his own company. The founding of Globalinx, its growth and activities show how one carries over the experiences of an industrial career into one's own business. One lesson he will teach in his presentation is that flexibility and the ability to turn leaden defeats into golden opportunities are essential traits to the would-be entrepreneur. ◇

## Biographies



**Stanley R. Rich** has founded nine companies and sold seven of them. All but one of his companies were based on his own inventions, for which he holds 55 U.S. patents. His book (with David E Gumpert) *Business Plans That Win \$\$\$*, Harper and Row, 1985, has been featured by the MacMillan Book Club, Venture Magazine, Working Woman, the Wall Street Journal and the Harvard Business Review.

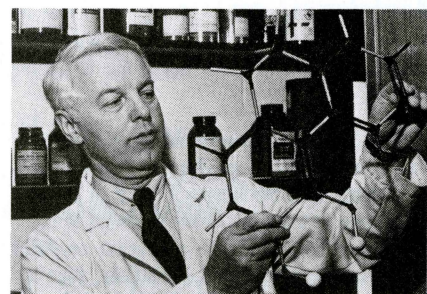
He is co-founder and former chairman of the MIT Enterprise Forum, has been adjunct Gordon Professor at MIT and serves as Adjunct Professor at Babson College. Business aspects of product development is one area in which he is an expert.

Rich and Gumpert are the principals in Venture Resource Associates which assists growing companies to develop the strategies and business plans needed to function efficiently and to attract investment.



**Beth Duston** is President of Information Strategies in Manchester, NH. She received a B.S. degree in chemistry from Simmons, and her M.L.S. in library science from SUNY. She was a bibliographer in the physics department at SUNY, Albany, and then spent 10 years as an information specialist at Aerodyne Research.

She has served as president of the Boston Chapter of Special Libraries Association, and is a board member of the N.H. High Tech Council and the N.H. State Automated Information Systems Board. She was elected a delegate to the first White House Conference on Libraries and Information Science in 1979. She holds membership in Information Industry Association, Special Libraries Association, Business and Industry Association as well as the American Chemical Society. Her paper "Mining the Company Library" appeared in the AMA publication *Growth Strategies* in 1987.



**John L. Neumeyer** is the Scientific Director and Chairman of the Board of Research Biochemicals. He worked as a research chemist after receiving the Ph.D. degree in pharmaceutical and agricultural chemical industries, was at

A.D. Little from 1963-69, and then became professor of medicinal chemistry at Northeastern University where he continues an active research program.

In 1980 he founded his company to provide neurochemicals for the neuroscientific research community. The chemicals are used as reference standards in clinical laboratories, pharmacological tools, biochemical markers, biological precursors, radioreceptor assays and structure-activity studies.



**Jerome Reid** received his B.S. degree in chemistry from City College of New York, and attended the Greater Boston Executive Program of the Sloan School of Management, MIT. He was at Polaroid Corporation for 25 years, retiring with the rank of Research Fellow in 1985. He is an inventor or co-inventor on 16 patents, and has several patents pending.

He founded Globalinx Corporation to provide process and product research and development and technical consulting services in the areas of applied polymer chemistry, thin film coating, hard copy imaging, automated manufacturing. A large component of his interests involves graphic arts and photochromics, optical recording and high resolution photo-imaging.

**Michael Strem** started Strem Chemicals immediately after receiving his Ph.D. degree from the University of Pittsburgh in 1964. He manufactures and markets chemicals for research and development as well as use as pharmaceutical and electronics intermediates. He is currently Chairman-Elect of the Northeastern Section. ◇

## MCG Meeting

### Medicinal Chemistry Group Meeting

**Tuesday, October 11, 1988**

Northeastern University  
Room 129 Hurtig Hall  
Boston, Massachusetts

#### Michael J. Welch, Ph.D.

Professor of Radiation Chemistry  
Mallinckrodt Institute of Radiology  
Washington University  
St. Louis, Missouri

#### Will Speak On:

F-18 Labeling of Biomolecules for Medical Imaging

4:00 p.m. Refreshments

4:30 p.m. Lecture

6:00 p.m. Dinner\* with Professor Welch

\*For dinner reservations, please call Dr. Richard Milius at (508) 651-8151 by October 6, 1988  
Members: \$10.00; Students and retirees: \$6.00

**The Nucleus is looking for an Associate Editor. This is a flexible volunteer position with the possibility of becoming Editor. Any interested member of the section please call the administrative office at 800-872-2054.**

### Medicinal Chemistry Group Officers, 1988:

#### Chairman:

Prof. James Mangold  
University of Connecticut  
School of Pharmacy, U-92  
Storrs, CT 06268  
(203) 486-3451

#### Program Chair:

Dr. Richard Milius  
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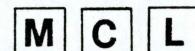
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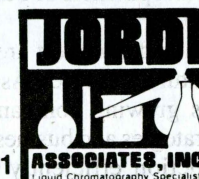
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# Winners of the 30th Annual Avery A. Ashdown High School Chemistry Examination Contest

STUDENT	SCHOOL	TEACHER
<b>First Prize – The Simmons College Award</b>		
Lev Gelb	Brookline High School	Reen Gibb
<b>Second Prize</b>		
Kenneth Frauwrith	Dartmouth High School	Ann-Marie Ladetto
<b>Third Prize (Co-awardee)</b>		
Jonathan Brecher	Lexington High School	Judith Massalem
<b>Third Prize (Co-awardee)</b>		
Leonardo Hsu	Dartmouth High School	Ann-Marie Ladetto
<b>Fifth Prize</b>		
Tal Kubo	Brookline High School	Reen Gibb

## HONORABLE MENTION – FIRST YEAR

Kareem Serageldin	Needham High School	Judith Waldron
Noah Graham	Newton North High School	George Martins
Jimmy Kwon	Needham High School	Judith Waldron
William Tucker	Exeter Area High School	Cary Kilner
Mikhail Elias	Needham High School	Judith Waldron

## HONORABLE MENTION – ADVANCED PLACEMENT

Tim Kokesh	Phillips Academy	Ronn Minné
Layne Bracy	Masconomet Regional High	Richard Souchuk
Peter Edmonston	Newton North High School	D. Montgomery Wells
Andrew Kuan	Wayland High School	Jacqueline Arendt
Yeh-Kai Tung	Lexington High School	David Olney
Tony Lee	Wayland High School	Jacqueline Arendt

# 1988 Ashdown Contributors

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Polaroid Foundation	

# The NESACS Award for Excellence in Teaching of Secondary School Chemistry

Janice Gepner  
The Winsor School  
Shirley J. Klepadlo  
Maynard High School



Shirley J. Klepadlo, Maynard High School, with Irwin A. Tamb, U.S. Army Natick Research Center, chairman of the award committee.



Janice Gepner, The Winsor School, with Tom Coilbert, NESACS chairman.

# 50-Year Members of ACS

Eliot F. Beach  
Frank C. Benner  
John Berg  
John F. Flagg  
Richard W. Forbes  
Harris L. Friedman  
Thomas R. P. Gibb  
Lena A. Hofstetter  
Frank B. Moody  
Glenn C. Williams



The winners of the 1988 Ashdown Chemistry Exam posed with their teachers at the May awards meeting. Standing (left to right) Reen Gibb, Ann-Marie Ladetto, Judith Massalem; seated – Tal Kubo, Lev Gelb, Kenneth Frauwrith, Leonardo Hsu, Jonathan Brecher.

# Aula Laudis Society

## 1987 Inductees:

Reen D. Gibb  
Brookline High School  
Laura Wick Hollowell  
Wellesley High School  
George F. Martins  
Newton North High School  
Ethel L. Schultz  
National Science Foundation  
& Marblehead High School



Winners of the Lyman C. Newell Awards: (left to right) Tom Gilbert, NESACS Chairman; Kenneth Brody; Josephine Parlegreco; Margaret Corbett; Laura Hollowell, Chair of the Newell Awards Committee; Wallace Gleekman, Chairman of the High School Education Committee.

## 1988 Inductees:

Bette Bridges  
Silver Lake Regional High School  
Richard Y. Coombs  
Brookline High School  
Frances Gray  
Manchester West High School  
James E. Johnson  
Falmouth High School  
Neil Soule  
Lexington High School, Retired  
Peter Stackpole  
Lynnfield High School  
Lisa Torres  
Lebanon High School



A number of Aula Landis members attended the May awards meeting: (left to right) George Martin, Ethel Schultz, James Johnson, Frances Gray, Richard Coombs, Betty Bridges, Reen Gibb, Peter Stackpole, Neil Soule, David Olney, Laura Hollowell.

# The 1988 NESACS Planning Workshop

by Mike Strem  
Chairman-Elect

Nearly twenty members of the Board of the Northeastern Local Section participated in a planning workshop held on Saturday, June 18, 1988 at Boston College and conducted by Pamela Ayre, Head of the ACS Department of Member and Professional Services. Special thanks to Professor Joe Billo of Boston College for making the arrangements to use Connolly House on the BC campus. I was the primary force behind holding this workshop because as your Chairman for 1989 I feel I need a more comprehensive view of where our section is heading. The workshop helped give me that view but it is probably a good idea that a session like this be held every year to keep the vision of our section in focus.

Pam Ayre commended the participants for their dedication to local section activities and challenged us to direct the day's discussion to development of a plan to enhance the section program. After a quick brainstorming session to list the overall strengths of the section, several topics were determined to be suitable targets for program enhancement. The topics chosen were the following:

- Promotion of public understanding of chemistry
- Support of science education at the pre-college level
- Topical groups
- Newsletter

The group was divided into subgroups, each of which was charged with determining new or enhanced section activities that could be conducted to improve the section program in the topic area.

## RESULTS FROM GROUP DISCUSSIONS

### I. Promotion of public understanding of chemistry

1. One-day symposium focusing on the scientific and legal issues related to the community right-to-know regulations
2. Waste minimization
  - development of an "experts" roster

3. Public information activities aimed toward improving the scientific literacy of the general public
  - airtime (possible use of local cable or university networks)

### II. Support of science education at the pre-college level (Recognizing possible overlap between this area and the promotion of public understanding, this group chose to limit its discussion to activities aimed toward promoting chemistry as a career.)

1. Expansion of the Speakers Bureau to include people who will go into the schools. Contacts to use in the development of this activity include: school science coordinators and the New England Association of Chemistry Teachers. [A related idea: don't forget the Girl and Boy Scouts and Local Explorers Posts.]
2. Continuation of the annual Holiday Lecture. This activity was identified as an excellent opportunity for bringing people together; however, to firmly establish it as an ongoing program, it needs a solid financial base.
3. "Chemistry for Mommies and Daddies," a model program targeted at the pre-high school audience and involving parents in workshop presentations and at-home follow-up activities.

### 4. Facilitation of science fair projects

- Presentation of kitchen chemistry demonstrations, perhaps set up at the PTA meetings so that parents can take the ideas back to kids (a program related to "Chemistry for Mommies and Daddies"). [The need for safety review of any demonstrations was emphasized.]
- Distribution of *WonderScience*.

### III. Topical Groups

1. Increased interaction with other technical societies, e.g., Electrochemical Society, SAS, mass

spec. group (ASMS?), to enhance topical group programs

### 2. Retired Chemists

- Underutilized source of volunteer help in organizing and maintaining section activities
- Need to contact a random sample of members with retired and emeritus status to determine whether they have any interest in meeting as a group or sponsoring and conducting group activities, such as providing assistance to area schools (an activity modeled after the Delaware Section's ChemVet program)

### 3. Younger Chemists

These members were identified as a possible target for topical group status; however, it was concluded that more information about the demographics of members in the under 35 age bracket was required to determine whether as a group *per se* these members had specific needs.

It was agreed that, irrespective of the decision about topical group status, more attention should be directed toward involving younger chemists in the governance and leadership core of the section.

Throughout the discussion of topical groups, the existence of a "medical group" was mentioned repeatedly although no one present possessed much information about the organization or activities of this group. It was clear, however, that the "medical group" was responsible for the program of one of the monthly section meetings; and it was recognized that there was insufficient coordination between the section program chairman and this group.

[Perhaps some discussion about the purpose of section topical groups should take place prior to any decision about the creation of additional groups. It

*Continued on page 12.*

# Exponential Dilutions Revisited

by Arno Heyn

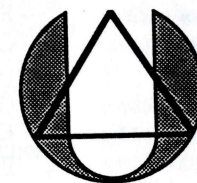
Last year, when the *NUCLEUS* published the series of articles<sup>1</sup> on an old article by E. Heintz<sup>2</sup>, titled "Physical Effects of Highly Dilute Exponential Solutions of Substances", we had no idea how prescient we were: Recently, *Nature* published an article by J. Benveniste et al.<sup>3</sup> titled "Human basophil degranulation triggered by very dilute antiserum against IgE." In this paper the authors claimed that the observable biological effect of the antiserum persists after many steps of tenfold, or in a parallel series, of hundredfold dilution carried out in a manner similar to those in the Heintz paper. In fact, Heintz carried out his investigation to dilutions of 1:10<sup>30</sup> while Benveniste went as far as dilutions to 1:10<sup>120</sup> and still claimed to observe the degranulation effect typical for the antiserum. Perhaps significantly, both Heintz and Benveniste claimed periodic variations in response. A lack of a reference to Heintz's work indicates that Ben-

veniste's group was unaware of the earlier work. Understandably, the editors of *Nature* showed appropriate skepticism, as they pointed out in a lead story in the issue, titled "When to believe the unbelievable" (p. 787), but other biomedical researchers at respectable laboratories repeated the experiments with supposedly similar results and were thus named as co-authors, bringing their number to 12 in addition to the senior author, J. Benveniste of the Université Paris-Sud in Clamart, France. To explain their results the authors speculate that perhaps the arrangement of water molecules is affected by the presence of the antiserum such that this "imprint" is retained through many steps of tenfold, or hundredfold dilution and has the same effect as the biological species which gave its imprint. The authors state, that because of the known concentration of the original antiserum, there would be less than one molecule present in the assay when the dilution is 1:10<sup>14</sup>. The

further dilution by a factor of 10<sup>106</sup> (total 1:10<sup>120</sup>) is truly astronomical. For comparison, this number exceeds by many powers of ten the estimated total number of atoms in the known universe.

The question can be posed in either of two ways: If the results of Benveniste et al. are spurious, what explanation can be offered for the fact that a number of independent investigators arrived at similar results? On the other hand, if the results are experimentally sound, what adjustments do we have to make in our concepts to allow for such effects? Heintz concluded in his 1942 follow-up paper<sup>4</sup> that his earlier results had been spurious in that he had grossly overestimated the reproducibility of results obtained with his, by present standards, rather crude equipment.

The editor of *Nature* proceeded to double-check the authors' work by having a team of three specialists visit Dr. Benveniste's laboratory and observing the investigator repeat the experiment on a "blind" basis. As reported in the



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July 28 issue<sup>5</sup> ("High-dilution" experiments a delusion"), the team consisted of John Maddox, on the editorial staff of *Nature* with a background in theoretical physics, James Randi, a professional magician, well known for his unmasking of tricks by claimed clairvoyants and Walter W. Stewart who has concerned himself during a number of years with studying errors and inconsistencies in the scientific literature. Regrettably none of the group had expertise in biomedical techniques or trace analysis. This team also had access to the original notebooks in which the work had been recorded. This team discovered that the dilution experiments do not always "work", in fact there had been periods of several months during which highly dilute solutions failed to degranulate basophils. Benveniste's group speculated that these failures might be due to possible contaminants in the distilled water used. The discussion with Benveniste's group concerning the original data showed

that no statistical treatment to the data was given, observations had been omitted for insufficient reasons, and whole series of runs, when the experiments did not give results consistent with expectations, had been omitted. In the "blind" experiments carried out in presence of the three observers no degranulation effect was observed for the highly dilute solutions but normal degranulation was observed at the usual maximum for the degranulation effect at 1:10<sup>2</sup> to 10<sup>3</sup> dilution. The investigators conclude that the original experiments had not been carried out with the degree of care needed to support the extraordinary claims, that the results obtained are not sufficiently reproducible to justify the claims, that systematic errors including observer bias may have vitiated the results and that insufficient attention was paid to statistical evaluation of the errors of the observations. The group was unable to corroborate the work done at the other three laboratories of coauthors because of their in-

ability to contact the investigators in Toronto, Israel and Milan in time for the follow-up article.

In a one-page response<sup>6</sup> Dr. J. Benveniste criticises the investigating group for their lack of expertise and the feeling of hysteria surrounding the work done before these observers. He claims that their report is full of inaccuracies and distortions and he compared the investigating team's conduct with "Salem witchhunts or McCarthy-like prosecutions [which] will kill science".

In the same issue seven letters in response to the Davenas and Benveniste article are published on pages 285-6, ranging from general philosophical comments to a very pertinent one concerning counting techniques and associated errors in this type of work<sup>7</sup>. I too, had written a letter to *Nature*, but unfortunately mine was too late to be included. I voiced the guess, based on the peculiar periodic increases and decreases in response both in Heintz's

*continued on page 14.*

## Planning Workshop

*continued from page 10.*

would also be useful to reach some agreement about ground rules for their operation, specifically, what part the groups should play in section activities, what reporting requirements, what interactions, etc.]

### IV. Newsletter

1. Increase membership involvement in newsletter content and production
  - Solicit volunteers to write articles
  - Solicit volunteers to edit and proof copy
2. Content
  - Professionalism should be maximized
  - Technical articles should be included
  - Articles of newsworthiness should also be included
3. Timeliness
  - Some discussion about methods of production ensued; and questions about desktop publishing

were raised, i.e., would such equipment facilitate more timely and efficient production of camera-ready copy. No conclusion was reached.

After each subgroup presented its recommendations, it was agreed that more discussion was needed to decide which activities should be pursued.

A brief discussion of fiscal management revealed that a review of the various trust agreements was in order to determine how much flexibility the section had regarding the use of the income from these funds. The section historian agreed to do some research and report the results of her findings to the Chairman.

### HOW TO MOTIVATE YOUR MEMBERSHIP

Ideas for motivating the membership, developed by the group, are as follows:

- *Just Ask*
- Recognize the workers and their work
- Provide a good cause to generate

interest and get members involved

- Offer good examples
- Play on their guilt (peer pressure)
- Consider time and distance (rotate meeting and program sites)
- Establish a network of contact people in key employment centers (liaisons)
- Offer opportunities for networking
- Plan a good marketing campaign to promote section activities to current potential members
- Increase industrial involvement
- Increase academic/industrial interaction
- Set up carpools

The workshop was concluded with a challenge to continue the planning effort and direct attention to the formulation of an action plan to implement the suggestions of this workshop. The Chairman-Elect presented another challenge by stating that one of his goals for the section in 1989 was to win the ACS Award for Outstanding Performance by a Local Section. ♦

## Historical Notes

As has been our custom during the past few years we devote this and a subsequent issue of the Notes to brief biographies of chemists and chemical engineers whose deaths have been reported during the past 12 months. Contributions to the Historical Notes column by readers other than its editor have been few and far between. Please help us to broaden the scope by sending your contributions to the undersigned at 163 Gray Street, Amherst, MA 01002.

**Charles M. Apt**, 64, a long-time employee and vice president of Arthur D. Little, Inc. died on April 8, 1988. He was an internationally recognized expert and consultant in the technology of flat-panel displays and color CRT systems, and in the chemical aspects of electronics manufacturing.

Charlie was a graduate of Brooklyn's Erasmus Hall High School. During World War II he was a forward observer with the field artillery of the First and Third Armies and was among the first to reach the infamous Dachau concentration camp in 1945, an experience that left an indelible mark. While awaiting transportation home he elected to attend Oxford University for a semester. When he was invited to matriculate he remained to obtain a degree in 1949. He then obtained a Ph.D. in physical chemistry under James Beattie at M.I.T. in 1952.

After teaching at Amherst College for two years Charlie came to A.D. Little for the remainder of his professional career, except for brief interludes with United-Carr and Gillette.

Until becoming involved with electronic systems work he was a member of the food and flavor section of A.D. Little's life sciences division and made contributions to food technology. His knowledge and ready wit made him a much esteemed colleague. He was a valued consultant to many A.D. Little clients.

**Leon D. Cerankowski**, 47, a research scientist for Polaroid Corporation since 1969, died on January 9, 1988. He was a 1963 graduate of the Drexel Institute of Technology and received the Ph.D. in

physical chemistry from Princeton in 1968. At Polaroid he was a coinventor of several processes used in instant photography, including the SX-70 Instant Integral System. He was also a coinventor of Polacure, a non-carcinogenic replacement for the epoxy catalyst MOCA.

**Morris A. Cynkin**, 56, professor of biochemistry at Tufts University School of Medicine since 1961, died on September 10, 1987. He was a graduate of City College of New York and received the Ph.D. from Cornell University where he was a Martin Gibbs Fellow.

**Arnold William Doyle**, 60, died on July 13, 1988. Until his recent retirement he was director of research and vice president of Koch Membrane Systems. After receiving the bachelor's degree in chemical engineering at M.I.T. in 1950 he served as a captain of the U.S. Army during the Korean War. He then spent 10 years at A.D. Little, Inc. pursuing environmental research and development before joining Koch in 1968. Arnold was active in community affairs, serving as chairman of Schools for Children, Inc., which sponsors schools for emotionally disturbed children in Arlington. He did volunteer work for the Roxbury-Weston Preschool.

**Percy Ehrlich**, 72, professor of chemistry at the Massachusetts Bay Community College in Wellesley, died on November 21, 1987. After secondary education at Winthrop High School he attended M.I.T. and received the S.B. (1935) and M.S. (1936) degrees in chemistry. For 25 years he was employed as a research chemist in the metallurgical field before joining the faculty at Mass. Bay where he taught chemistry, mathematics, and environmental science. Perc was an active member of the New England Association of Chemistry Teachers and served on the editorial board of its journal. He was a president of the Buxton branch of the American Begonia Society and a member of the Hemerocallis Society. He also served as president of Temple Beth Israel in Waltham.

Walter Stockmayer writes that Perce was "a truly gentle and rational man."

**Paul M. Fye**, 75, director of the Woods Hole Oceanographic Institution from 1958 to 1977, died on March 11, 1988. He was a native of Johnstown, Pa. and did his undergraduate work at Albright College in Reading, Pa. (1935). The Ph.D. was awarded at Columbia University in 1939. He began his professional career as a faculty member at Hofstra University. During World War II he directed research at the Underwater Explosives Research Laboratory, then became a staff member at the Naval Ordnance Laboratory for 10 years.

During his term as director at Woods Hole the budget and endowment had significant increases. Research facilities expanded and came to include the Quisset campus and the Clark Laboratory. A joint Woods Hole-M.I.T. graduate program was inaugurated and since 1968 has awarded more than 200 doctoral degrees in marine sciences. In 1983 a chemistry laboratory at Woods Hole was named in honor of Paul Fye.

**Mary M. Holleran**, 85, a retired research chemist at the Boston University School of Medicine, died on June 8, 1988. She was a 1924 graduate of Emmanuel College. She was the author of several publications in ACS journals.

**Howard C. Haas**, 66, a research manager at the Polaroid Corporation, died on September 3, 1987. He was a native New Yorker and received the B.S. at City College in 1941. He was employed briefly at General Foods but then entered military service to carry out analysis of food products. He later served in the Oahu, Hawaii, laboratory of the Chemical Warfare Service. After the war he obtained the Ph.D. at the Polytechnic Institute of Brooklyn, then joined Polaroid in 1949, where he directed research on a wide spectrum of problems in polymer chemistry and imaging technology.

**James Rhyne Killian**, 83, died on January 29, 1988. Extensive biographies of Jim appeared in the Boston

## RIGHT TO KNOW CONFERENCE

The Public Service Committee of the Northeastern Section of the American Chemical Society together with Framingham State College is sponsoring a RIGHT TO KNOW CONFERENCE to help all members of the northeast region—academic, industrial, and residential—understand the latest regulations of the Superfund Amendment and Reauthorization Act, "SARA". All High School, College, and Industrial Safety Officers as well as community SARA coordinators and other community leaders will be invited.

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Globe on January 31, 1988 and in the New York Times. It may surprise some to learn that the great President of M.I.T., whose service to education and to national affairs are so well-known, was at once time a member of the Northeastern Section, ACS. During his years as editor of the Technology Review (1930–1939) he provided much needed advice to our Board of Publications. In 1939 he became an assistant to President Karl Compton at M.I.T. and what happened thereafter "is history."

**Richard Stetson Morse**, 76, founder of the National Research Corporation and former Assistant Secretary of the Army in both the Eisenhower and Kennedy administrations, died on July 1, 1988.

Dick was a member of the M.I.T. class of 1933, of which he was president at the time of his death. Following graduate work at the Technische Hochschule in Munich he joined Eastman Kodak Co. in 1935 where he studied high vacuum technology under the legendary K.C.D. Hickman. Dick returned to Boston in 1940 and founded National Research in a walkup lab on Brookline Avenue not far from Fenway Park; I recall visiting him there during the

early 1940s to get advice on the construction and operation of a molecular still I needed in my research.

National Research hit the jackpot when high vacuum technology became important for the metallurgy of magnesium during the war. After 1945 high vacuum technics were applied to a host of industrial processes. Minute Maid frozen citrus fruit concentrate was introduced by a subsidiary of National Research, which by then occupied a fine laboratory on Memorial Drive in Cambridge. Upon leaving National Research Dick became director of R and D for the Army, and later became Assistant Secretary. In 1961 he came to M.I.T. as a senior lecturer in the Sloan School of Management where he was involved in developing an experimental base for the launching of new enterprises. He retired from M.I.T. and from the M.I.T. Development Foundation in 1977. Dick Morse was a member of the National Academy of Engineering and a director of the Boston Museum of Science and the Woods Hole Oceanographic Institute.

Edward R. Atkinson  
Amherst, Mass.

## Exponential Dilutions

*continued from page 12.*

work and that of Benveniste et al., that the supposed effect may be due to adsorption or similar carry-over effects so that the actual concentrations present were essentially independent of the supposed dilution factor, but depended on the order in which given pieces of equipment were used. I suggested in the letter that it would be useful to have an experimenter with broad experience in trace analysis methods repeat the work. Such scientists would be sensitive to the possible errors introduced by trace contamination, adsorption effects and the efficacy of cleaning methods used.

The editor of *Nature* thinks that the matter had been resolved. Benveniste is not satisfied that his work has been

invalidated, and others, no doubt, will jump into the fray. It will be interesting whether the issue dies or whether there will be future flurries of reports of the magical effects of highly dilute solutions. ♦

### References

- <sup>1</sup>*The Nucleus*, 65(7), 10–11 (April 1987); (8), 8–9 (May 1987); 66(1) 12–13 (October 1987).
- <sup>2</sup>Heintz, *Die Naturwissenschaften*, 29(48) 713–725 (1941); *C.A.*, 37, 4954<sup>5</sup> (1943).
- <sup>3</sup>E. Davenas, others and J. Benveniste, *Nature*, 333, 816–818 (1988).
- <sup>4</sup>E. Heintz, *Die Naturwissenschaften*, 30, 642(1942); *C.A.*, 38, 3537<sup>4</sup>(1944).
- <sup>5</sup>John Maddox, James Randi and Walter W. Stewart, *Nature*, 334, 287–290 (July 28, 1988).
- <sup>6</sup>Benveniste, *ibid.* p. 291.
- <sup>7</sup>I. Lasters and M. Bardiaux, *ibid.*, 285–6.

## Chemistry Out of this World

"Chemistry Out of this World"—a symposium presented by the Public Service Committee of the Northeastern Section of the American Chemical Society and the Boston Museum of Science funded by the Lowell Institute of Boston.

The Symposium will be held at the Boston Museum of Science, Science Park, Boston on Tuesday, November 1, 1988 at 9:00 a.m. The program is as follows:

- 9:00 "Getting Into Space"—rocket chemistry.  
Jerry A. Bell, Simmons College, Program Moderator
- 10:00 "Earthly Preparations for Space"—designing and preparing experiments.  
Debra Wilfong, 3M Company, St. Paul, Minnesota
- 11:00 "Heavenly Experiments"—doing them in space.  
Jay Apt, Payload Specialist Astronaut, NASA
- 12:00 Lunch
- 1:00 "Spinoffs from Space"—neat stuff resulting from the Space effort!  
Leonard Ault, NASA

The Symposium is open to High School Teachers accompanied by selected High School Students. It is free, but tickets must be obtained prior to the event. Because these symposia are generally very popular and space is limited, it is suggested that you send your request as early as possible to avoid disappointment.

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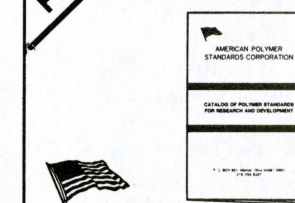
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# Calendar

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## Monday, October 10

Dr. Gautam Desiraju (E.I. Dupont,  
Delaware)  
“C-H...O Interaction and the Design  
of Organic Crystal Structures”  
Brandeis University  
Gerstenzang 122 at 4:00 p.m.

## Wednesday, October 12

Professor Garry A. Rechnitz (Unidel  
Professor, U. of Delaware)  
HAROLD A. IDDLES LECTURER  
“Biosensors: Asking Questions of  
Nature”  
University of New Hampshire  
Parsons Hall, Room L1 at 4:00 p.m.

## Thursday, October 13

Professor Garry A. Rechnitz (Unidel  
Professor, U. of Delaware)  
HAROLD A. IDDLES LECTURER  
“Molecular Recognition Elements for  
Biosensor Design”  
University of New Hampshire  
Parsons Hall, Room L103 at 11:00 a.m.

Professor D. Max Roundhill (Tulane)  
HAROLD A. IDDLES LECTURER  
“Thermo and Photochemistry of  
Binuclear Platinum Complexes”  
University of New Hampshire  
Parsons Hall, Room L1 at 4:00 p.m.

## Monday, October 17

Professor Dudley R. Herschbach  
(Harvard University)  
“Electronic Structure in Strange  
Dimensions”  
Brandeis University  
Gerstenzang 122 at 4:00 p.m.

## Tuesday, October 18

Professor R. Stolow (Tufts)  
“Computer Assisted Instruction in  
Organic Synthesis with LHASA”  
University of New Hampshire  
Parsons Hall, Room L103 at 11:00 a.m.

## Saturday, October 22

A ONE DAY SYMPOSIUM  
Michael R. Detty (Eastman Kodak, Co.)  
Richard H. Clarke (Boston University)  
Irene E. Kochevar (Harvard Medical  
School)  
Beauford W. Atwater (The BOC Group  
Technical Center)  
“Photochemistry and Spectroscopy in  
Medicine”

A Poster Session on “Topics in  
Photochemistry and Spectroscopy”  
Worcester Polytechnic Institute  
Salisbury Laboratory, Room 104 at 8:30  
Registration Requested

## Monday, October 24

Professor Stephan Isied (Rutgers  
University)  
“New Horizons in Long Range  
Biological Electron Transfer Reactions”  
Brandeis University  
Gerstenzang 122 at 4:00 p.m.

Notices for the NUCLEUS Calendar  
should be sent to:

Cynthia B. McGowan  
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Wellesley College  
Wellesley, MA 02181  
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