

THE NUCLEUS

May 1990

Of the Northeastern Section of the American Chemical Society Vol. LXVIII, No. 8

Monthly Meeting

*Education Night
Stephen A. Deutch*

Historical Notes

Fritz Zwicky (Part 2)

Candidates' Statements

*May Election for
1991 Offices*

The Coast is Not Clear

*Boston Harbor and
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16	GC/MS course	Huntington, NY
17	Basic LC course	Rochester, NY
23	Basic LC course	Piscataway, NJ
JUNE		
6	Capillary GC course	Huntington, NY
7	Capillary GC course	Piscataway, NJ
14	Capillary GC course	Syracuse, NY

Date	Course	Location
JUNE		
19	GC/MS course	Paramus, NJ
20	Capillary GC course	Valley Forge, PA
20	Basic LC course	Huntington, NY
21	GC/MS course	Burlington, MA
26	Capillary GC course	Albany, NY
JULY		
24	GC/MS course	Rochester, NY



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Cover: John M. Deutch, MIT

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THE NUCLEUS

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Published monthly from October to May by the Northeastern Section of the American Chemical Society, Inc.



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Historical Notes

by Edward R. Atkinson, Amherst, MA

In the March issue this note began with an account of Fritz Zwicky, a native of Bulgaria, trained in Switzerland, member of the faculty at Cal Tech. 1925-1972, an authority on the physics of crystals, liquids and solids, and the originator of "Zwicky's Morphological Research Method".

Most of the material in the first part can be found in the standard biographical treatises. That which follows (as told to me by John Strong, who was a colleague of Zwicky at Cal Tech) cannot be found in these works.

Fritz Zwicky was an irascible person (the term curmudgeon comes to mind). His debates with Linus Pauling that packed the seminars each gave at Cal Tech are legendary. He had a special antipathy toward his colleagues whose names began with the letter "M", not the least of which was Robert Millikan. After measuring the charge on the electron in his famous oil drop experiment, Millikan went on to devise detente between science and religion. His book on the subject was very popular in the early 1930s, particularly among young student caught between the Scylla of conservative parental upbringing and the Charybdis of liberating college life.

When the foundation for the new laboratory was being dug on the campus someone painted the words "Jesus Saves" on the power shovel. The next night another legend was added: "But Millikan takes all the credit." This so tickled Zwicky that he took a photo of the scene. A few days later the Cal Tech newspaper published a photo of Zwicky taking *his* photo. Zwicky always maintained that this indiscretion cost him at least a couple of years of salary increases.

On one of his frequent trips back to Switzerland Zwicky stopped at Amherst for a visit with Strong who was Five College Professor of Astronomy. Smith College had a fund to support lectures in Astronomy and it was sug-

gested that Zwicky deliver them. Pres. Mendenhall of Smith entertained Zwicky and friends at a luncheon. In the conversation at table a number of names of prominent scientists came up for discussion. Zwicky, however, labelled them as "cadavers." In desperation, to make the conversation more amicable, Mendenhall raised the name of Vannevar Bush, a man widely respected for his contribution to the U.S. war effort and to the establishment of formal post-war support of science by government agencies. "Oh!", said Zwicky, "he was the greatest cadaver of them all!" Zwicky was not asked to deliver the lectures!

Zwicky's reputation was known abroad. While visiting in Switzerland Mrs. Strong had occasion to ask a vice-president of the Federation whether he knew Professor Zwicky. The V.P. replied that there were quite a few Zwickys in Switzerland. When told that the Professor Zwicky in question was at Cal Tech and was having trouble obtaining his security clearance from the U.S. Government, the V.P. replied "Oh! *That* Zwicky! I feel sorry for the U.S. Government."

While reading the first portion of this note in the March issue, Walter Stockmayer was reminded of a Zwicky story told him by a former graduate student who had done his undergraduate work at CalTech during the Zwicky era: Because of his inability to learn students' names Zwicky became the victim of a plot hatched by a former student with the assistance of Zwicky's faculty colleagues. Zwicky handed out copies of an exam in analytical mechanics, left the room and, as expected, did not return until he collected the exam books three hours later. During the interval the student took copies of the exam to members of the faculty who solved the problems. The exam book was handed to Zwicky bearing the name of "Omar Schitzdiik". When Zwicky returned the

graded exams he was anxious to meet Omar who was "the only good student in the class". He was told that Omar was not in class that day because he had a hangover, the result of a party the previous night. A week later Omar was again absent, for the same reason. Zwicky then checked with the Cal-Tech Registrar and found that his good student was mythical.

Fritz Zwicky died on February 8, 1974 in Pasadena and is buried in Mollis, Switzerland. ◇

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Abstract

Observations on U.S. Industrial Productivity

Late in 1986 MIT convened a commission on Industrial Productivity which was charged with addressing a decline in U.S. industrial performance perceived to be so serious as to threaten the nation's economic future.

The Commission spent two years on detailed investigations of eight major manufacturing industries, including the chemical industry. After hundreds of interviews, plant visits on three continents and input from CEO's and labor leaders, the findings were issued last spring in the book *Made in America*, published by the MIT Press.

The Commission concluded that the myriad causes frequently cited for the productivity problem can be condensed into a handful of key recurring weaknesses. The Commission concluded that major changes in the ways Americans learn, produce, work together, compete internationally and provide for the future will be required to insure that future productivity levels will produce a rising standard of living. As the only chemist on the MIT Commission, Dr. Deutch will present his views on the study and its findings and recommendations. ◇

May Meeting

*The 725th Meeting of the
Northeastern Section of the
American Chemical Society*

Education Night

Thursday, May 10, 1990

Simmons College, Main College Building,
300 The Fenway, Boston, Massachusetts

5:30 Social Hour, Special Function Room

6:00 Dinner, The Fens Room

7:15 PRESENTATION OF AWARDS
Presentation of Avery A. Ashdown Chemistry Examination Contest Awards
Presentation of Simmons College Prize
Presentation of the Northeastern Section Award for Excellence in Teaching at the Secondary School Level
Presentation of Lyman C. Newell Grants
Induction of New Members into Aula Laudis
Presentation of James Flack Norris Undergraduate Research Fellowships
Presentation of the Philip L. Levins Memorial Prize
Presentation of Fifty-Year Membership Certificates

8:15 LECTURE, Room C103
"Observations on U.S. Industrial Productivity"
John M. Deutch, Massachusetts Institute of Technology

Refreshments will be served after the program. Free parking behind Main College Building. Enter from Avenue Louis Pasteur. Dinner reservations should be made no later than May 4, 1990. Please call Mrs. Karen Piper at (508) 456-8227 or (800) 872-2054. Reservations not cancelled at least 24 hours in advance will be billed for the dinner price. Members, \$20.00; Non-members, \$22.00; Students and Retirees, \$8.00. THE PUBLIC IS INVITED.

Election of 1991 Officers, Councilors and Committees

The ballot for voting for the 1991 candidates for the various Section positions is enclosed with this mailing. Also enclosed are the special ballot envelope and addressed return envelope. Candidates' biographies and statements are in this issue of the Nucleus beginning on page 12.

BE SURE to vote and return your ballot by the June 1, 1990 deadline.

If you are a Section member and failed to receive the election materials, please call the Section office, 1-800-872-2054 or (617) 456-8227.

Biography

John M. Deutch

Dr. Deutch is currently Provost and Karl Taylor Compton Professor of Chemistry at M.I.T. As Provost, since 1985, he has served as the principal deputy to MIT's President and the Institute's chief academic officer.

Dr. Deutch served as Dean of Science, 1982-1985 and Head of the Chemistry Department, 1976-1977. While on leave from MIT between 1977 and 1980 he served in the U.S. Department of Energy as Director of Energy Research, Assistant Secretary for Energy Technology, and Under Secretary of Energy.

In 1961 he received a B.A. in history and economics from Amherst and an S.B. in chemical engineering from MIT. In 1965 he earned a Ph.D. in physical chemistry from MIT and was a postdoctoral fellow at the National Bureau of Standards in 1966, followed by an appointment as Assistant Professor of Chemistry at Princeton University. In 1970 he returned to MIT as Associate Professor and became a full professor in 1973. In 1980 he was named Arthur C. Cope Professor in 1980 and the Karl Taylor Compton Professor in 1987. His primary research interests have included non-equilibrium statistical mechanics, the structure of fluids, dielectric and magnetic relaxation, light scattering and polymer physical chemistry. He is the author or co-author of over 125 technical articles. He has served on editorial boards of the leading journals and review publications in his field.

Dr. Deutch has served as a member of numerous advisory panels for the NSF, Army, Defense Department, EPA and several presidential oversight committees and science councils.

He has received several Medals, Tributes and honorary doctorates.

From 1986-1989 Professor Deutch served as the lone chemist on the MIT Commission on Industrial Productivity; results of that study will be highlighted in his talk. ◇

MCG Meeting

Medicinal Chemistry Group Meeting

Tuesday, May 8, 1990

Boston College
307 Higgins Hall
Chestnut Hill, Massachusetts

4:00 p.m. Coffee

4:30 p.m. "Protein Crystal Structure Analysis: Transthyretin-Flavone Complexes - Differences between Substrate and Inhibitor Binding"

Vivian Cody, Ph.D.

Medical Foundation of Buffalo, Inc.
6:00 p.m. Dinner
Ming Garden Restaurant
Chestnut Hill

Dinner reservations must be made no later than May 7, 1990. Please call Mrs. Piper at (800) 872-2054 or (508) 456-8227.

Dinner: \$ 10; Students \$ 3
The Public is Invited.

Vivian Cody

Vivian Cody, a Senior Research Scientist at the Medical Foundation of Buffalo, directs research projects involving crystallography and conformational analysis of enzymes and their hormone/drug inhibitor interactions. Dr. Cody received her Ph.D. in chemistry from the University of Cincinnati and had a postdoctoral fellowship at the University of Missouri-St. Louis and an NIH endocrine traineeship at the Medical Foundation



of Buffalo. She is currently Associate editor of the Journal of Molecular Graphics and Endocrine Research; is secretary of the American Crystallographic Association, president of the Buffalo Chapter of Sigma Xi, and treasurer of the Western New York Section of the American Chemical Society. ◇

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Protein Crystal Structure Analysis: Transthyretin-Flavone Complexes — Differences Between Substrate and Inhibitor Binding

X-Ray diffraction data were measured to 2.25Å on a crystal of human transthyretin (TTR; thyroxine-binding prealbumin) co-crystallized with a plant flavonoid derivative, 3',5'-dibromo-4',6'-dihydroxy-3-methylflavone (EMD-21388) which is both a potent competitor of thyroxine binding to transthyretin and a potent inhibitor of iodothyronine deiodinase enzyme activity. The difference Fourier electron density map calculated using the reported native TTR structure as a starting model showed electron density in the hormone binding channel corresponding to the EMD-21388 structure. Interpretation of this density indicates that in its major binding mode the bromophenolic ring lies along the crystallographic two-fold axis running through the binding channel with its 4'-OH within hydrogen bonding distance of two symmetry related Lys-15 residues located near the channel entrance. This orientation is different from that reported for the TTR-thyroxine complex in which the thyroxine 4'-OH is buried deeply within the channel near Ser-117 and the hormone amino acid side chain is near Lys-15 and Glu-54 at the channel entrance. This unusual model may explain the high binding affinity of EMD-21388 for TTR. ◇

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Board of Directors

Condensed Minutes, Meeting of February 8, 1990

by Michael J. Hearn, Secretary

Treasurer's Report: J. Piper provided the status of the current operating fund and itemization for January.

Board of Publications: C. Costello reported that the board is preparing an evaluation of the 1988/89 Directory. Any input from members is welcome. The March issue of the *NUCLEUS* is on schedule, being the first issue set by the new vendor, CIS in Cambridge. Advertising for the special April issue already is \$ 6000 with more yet to come. This issue will be 32 pages with at least 5000 copies to be distributed to registrants at the National ACS Meeting in Boston. There will be informative material for meeting registrants in addition to the usual Section news.

Budget: J. Piper distributed the budget proposal. It was MOVED and VOTED to accept the budget as presented.

Constitution and Bylaws: A. Heyn reported that the amendments voted in December are now in the hands of the national ACS office. Approval is expected in 2-3 months.

Public Service: P. Samuel reported that the following activities are planned: Northeastern Section Day at the State House on April 25, during the National Meeting week; a high school symposium on October 31 (Museum of Science); Science Teaching Day in the fall; a holiday lecture on December 27 (Museum of Science); three public lectures in 1991.

Safety: J. Kaufman introduced Dr. Wagner (Strem Chemical Co.) who joined the Academic Safety Council.

Public Relations: M. Chen stated that plans are being made with the help of D. Bagley to distribute ACS material on careers in chemistry to 200 high schools and advisors.

National Meeting: E. Billo reported

that the planning was complete and the current C&E NEWS lists the preliminary schedule of events. The NESACS social hour, cosponsored by local colleges, will be on April 25.

Old Business: A. Obermayer presented the annual report of the trust funds. He explained the reasoning for the existence of the several accounts. Funds not expended for their designated purpose are invested again to produce additional income.

New Business: W. Gleekman reported on the status of the ticket arrangement for the April 24 Red Sox-California Angels game. He explained that tickets not sold in advance or at the Hospitality Center could be sold easily at local high schools on the day of the game. Although it might be possible to reverse the decision to buy the block of 500 tickets, it was MOVED and VOTED not to rescind the purchase. ◇

Condensed Minutes, Meeting of March 8, 1990

by Michael J. Hearn, Secretary

Treasurer: J. Piper reported on the status of the operating fund. With receipt of the ACS allocation the bank account has a positive balance.

Trustees: P.A. Brauner presented a graphical representation of the flow of money into and out of the several trust funds and their income accounts. She and G.R. Handrick were thanked by J. Billo for this clarification.

Publications: C. Costello described the contents of the 32-page special April issue. 6000 extra copies are to be available for registrants at the ACS Spring meeting in Boston. Advertising income for this issue has been \$10,000.

Budget Committee: M. Strem suggested that centralization of the solicitations of outside funds could be achieved if the Treasurer were kept informed.

Membership: A straw vote indicated a preference for all members being invited to the October 11 meeting devoted to Membership. The 50-year members will also be invited.

Nominating Committee: One candi-

date for Chairman-elect has resigned, leaving only one candidate. It was MOVED and VOTED to request the committee to find a second candidate for the ballot. It was pointed out that the Nominating Committee is not obliged to provide an additional candidate and that it would be difficult to do so at this late time. It was also MOVED and VOTED that incumbent office holders not be identified as such on the ballots.

Public Relations: Plans for publicity for the Esselen Award Meeting are in place.

Continuing Education: A. Viola stated that new volunteers with fresh ideas for the program are sought. A. Rosner suggested a presentation on chemical information services which is likely to be received enthusiastically.

Public Service: V. Wilcox and J. Bell will be giving demonstrations at the Section's Statehouse program on April 25.

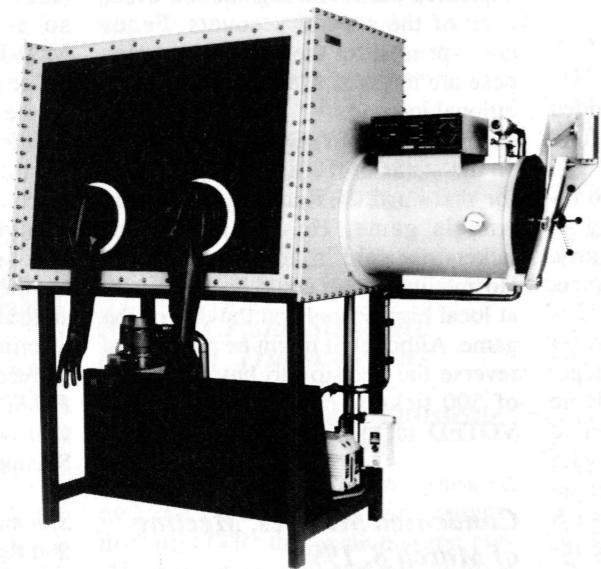
Summerthing: M. Chen announced that the Salve Regina campus in Newport, RI will be the site for Summerthing for the weekend of August 3.

National Meeting: Plans are in place. NESACS, together with 13 colleges and universities will host a social hour during meeting week. Prof. N. Allinger will be the recipient of the ACS James Flack Norris Award in Physical Organic Chemistry at the Spring meeting.

Old Business: M. Chen and W. Gleekman will secure funds from the Corporation Associates for distributing 1000 booklets on careers in chemistry to high school guidance officers and science departments. It was suggested that it would be more effective to make the copies available to science department chairmen or chemistry teachers, rather than to guidance councilors or principals.

New Business: E. Hopkins discussed the role of the National ACS Committee reviewing a proposed statement to Congress outlining the ACS position on conflict of interest of scientists receiving federal funds. D. Bagley urged that students should be specifically invited to attend the ACS President's plenary session on the supply of scientists for the 21st century. ◇

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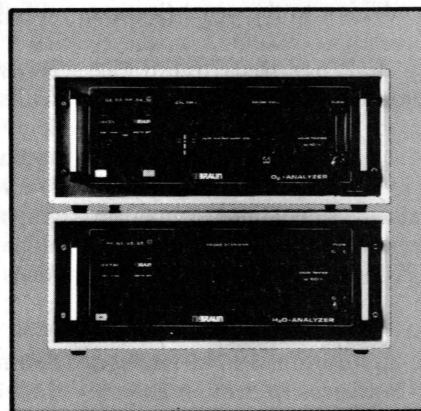
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Northeastern Section Budget

Annual Account	#	1989 Actual	1990 Requested General	1990 Requested Offsetting	From Acct.
National Allotment	10	15,549.00	15,635.00		
Travel Grants	11	2,064.81		1,000.00	
Local Dues	12	18,971.00	20,500.00		
New-member Commission	13	42.50	30.00		
Contributions	14	1,818.00	8,844.35		
Ashdown Awards	15	430.00		400.00	
Continuing Education	16	150.00		2,000.00	
Hospitality	17	3,590.00		4,000.00	
Savings Interest	18	449.04	400.00		
Miscellaneous	19	3,511.00			
Trustees: Cons. Acct.	20	237.75		275.00	
Perm. Inc. Acct.	21	17,212.79		20,750.00	
Norris Inc. Acct.	22	20,566.60		20,260.00	
Richards Inc. Acct.	23	100.00		16,000.0	
Publ.Inc.Acct.	24	5,263.81		450.00	
Hill Award	25	368.28		1,400.00	
Esselen Award	26	8,107.20		9,000.00	
Levins Award	27			700.00	
NERM	28	653.03			
Summer Programs	29	614.00		1,000.00	
Advertising	30	24,311.47		20,260.00	
INCOME TOTALS		124,010.28	45,409.35	97,495.00	
Chairman	50	3,147.28	500.00		
Business Office	51	2,712.79	2,700.00		
Treasurer	52	5,037.25	250.00	6,000.00	21
Archivist	53	7.00	500.00		
Publication	54	8,623.25			
Nucleus	55	39,939.09	17,635.00	20,260.00	30
Directory Maint. Program	56	15.62		450.00	24
Ballots	57	888.03	1,000.00		
Public Relations	58	1,410.81	1,450.00		
Education	59	778.68	2,350.00		
Newell Awards	60	253.66	300.00		
Ashdown Awards	61	375.90		400.00	21
Continuing Education	62	2,014.12	1,600.00	400.00	15
Hospitality	63	100.34		2,000.00	16
Hill Award	64	6,167.61	1,000.00	4,000.00	17
Norris Award	65	197.45		1,400.00	25
Speakers Bureau	66	8,321.65		12,000.00	22
Summer Scholars	67	421.97		460.00	22
Richards Medal	68	7,770.83		7,800.00	22
Esselen Award	69	100.00		11,000.00	23
Sec. School Award	70	8,562.71		9,000.00	26
Aula Laudis	71	2,235.16		2,250.00	21
Trustees	72	161.81		200.00	21
Safety Committee	73	433.62		275.00	20
High School Group	74	267.06		1,900.00	21
Chairman-elect	75	0.00			
Membership Committee	76	414.00	500.00		
Public Service	77	151.13	1,350.00		
Retired Chemists	78	9,498.92		5,000.00	23
Summer Programs	79	2.09	250.00		
Travel Grants	80	429.26		1,000.00	29
Adm. Secretary	81	6,860.78	3,000.00	1,000.00	11
Miscellaneous	82	9,240.00	10,584.00	5,000.00	21
1990 Meeting	83	50.00		5,000.00	21
Levins Award	84	59.65	440.35		
	85	18.41		700.00	27
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Trustees' Report

11 January 1990

Prepared by G.R. Handrick

Market Value of NE Section Trust Fund Assets (stocks, bonds)

	on 12-31-89	on 12-31-88
Endowment Funds		
Consolidated Account	\$ 790,948	\$636,856
Esselen Award	143,407	127,753
	934,355	764,609
Income Accounts		
Richards Trust	52,584	
Norris Awards	17,660	
Publications Trust	5,187	
Permanent Trust	24,989	
Hill Awards	-0-	
	100,420	110,345
	1,034,775	874,954
Cash Balances - 1 January 1990		
Consolidated Account	\$ 6,650	
Esselen Award	1,374	8,024
Richards Trust	22,233	
Norris Awards	2,212	
Publications Trust	2,015	
Permanent Trust	5,765	
Hill Awards	5,612	
	37,837	45,861

Thus, if all accounts were liquidated by sales of the stocks and bonds, we could realize \$1,080,637, at current prices.

Cash Flow in 1989

Income - earned income from investments, available for Section expenses

Consolidated Account	\$ 50,654	
Esselen Award	9,322	59,976
Richards Trust	4,607	
Norris Awards	2,490	
Publications Trust	785	
Permanent Trust	3,506	
Hill Awards	450	
	11,838	
	\$ 71,814	
	(\$ 69,900 anticipated for 1990)	

NEACT

Central District Meeting

The N.E.A.C.T. (New England Association of Chemistry Teachers) Central District Meeting will be held on Saturday, May 5th, at the Massachusetts College of Pharmacy and Allied Health Sciences. The program "Drug Design and Delivery", includes "Interactions of Drugs in the Body", "Chemotherapy of Parasitic Diseases", and "Laser Dyes Across the Spectrum." Registration is at 8:30 in Room 212 of the White Building. Lunch will be at Simmons College. If you plan to attend, contact Dr. Judith Kelley by Saturday, April 28th: (617) 862-5469; 185 Burlington Street, Lexington, MA 02173. ◇

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Election of Candidates for 1991

In the interest of providing maximum information and expression of opinions by the candidates for election in 1990, 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. Except in cases where editing was necessary to meet space requirements, these statements have been reproduced without change. An official ballot along with a ballot envelope and a 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 on the ballot was determined by lot. Comments regarding the election or election process may be addressed to the Nominating Committee Chair, Michael E. Strem.

BALLOT DIRECTIONS: Vote for the candidate(s) of your choice, insert your ballot into the ballot envelope, insert the ballot envelope into the return envelope, sign your name on the return envelope only, affix postage, and mail.

THE BALLOT MUST BE RECEIVED BY JUNE 1, 1990.

Chairman-Elect

Katie Stygall

It is a great honor for me to be nominated for the position of chair of the Northeastern Section of the American Chemical Society. I am excited and enthusiastic about the prospect of working with you in that capacity. I have been active in the section since I arrived in New England five years ago—having been enticed into joining a committee by a very persuasive colleague. (Had I known what joining a committee really meant, I might not so readily have done so!) I have served on three committees—public relations, hospitality, and public services. This is my second year as chair of public relations, a time consuming, interesting and sometimes frustrating responsibility. I believe that my work with these committees has prepared me well for working with you as chair.

If elected, I have three major goals for our section—1. To increase our contribution to science education at all levels. I am especially concerned about science teaching at the elementary and middle schools and hope to support teacher in-service training and create an organization so that our members can go to middle schools and do demonstrations and hands-on activities with the children. I should also like to continue the excellent work the public services committee does in educating the general public about environmental issues. 2. I should like to make our section more inclusive—it seems to me to be very important to attract new, active members and we need to find effective ways of achieving this goal. 3. I should like to continue and expand the work we are doing to decrease “chemistry phobia” among students and members of the general public. Our society has urgent environmental problems to solve. We shall not be able to solve these problems without this work being supported by the general public. I am worried, as many of us are, about the decreasing number of students entering scientific disciplines and about the growing gap between the supply and demand of chemists. I believe the reasons for our poor public image are many and complex and will not be easily solved, but I should like our society to do what we can to improve this situation. I should also like to strengthen the link between legislators and the section and would like to see members of our society playing an active role in

legislative hearings that involve chemistry.

For those of you who are interested in my background: both my degrees—in biochemistry—were obtained at University College, London (noted for its preserved founder who still sits in a glass box in the hall). I came to this country ten years ago as a postdoctoral research fellow at Caltech. Whilst there, I decided that though I enjoyed designing experiments, my ability to perform them was about as great as my ability to sing on key and that what I really loved doing was teaching. I have been teaching ever since—both at the high school and college level. I am an assistant professor at Bradford College where I feel very much at home because it is an institution that supports and encourages innovative teaching techniques. In my “spare time” I do chemistry demonstrations for local elementary schools and high schools and help organize symposia for high school and college chemistry faculty. I am currently working on a one-day workshop entitled “The Travelling Chemistry Demonstration Presentation” that will run during the Eleventh Biennial Conference on Chemical Education, to be held in Atlanta, Georgia in August.

If elected, I shall do my best to be innovative, energetic, receptive to your constructive criticism and to retain my sense of humor! One last note—if elected I shall also feel a little daunted, I would have several very hard acts to follow!

Judith Kelley

Candidacy withdrawn



Treasurer

James U. Piper

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

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 Activities: 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, the National ACS, and state and federal agencies. The Section currently operates with a budget of \$130,000 of which 45% comes from Trust Funds and 25% from local and national dues. About 35% of all expenditures are related to the presentation of awards at all levels, from high school students to professional chemists. Administrative expenses constitute 20% of expenditures with the remaining 45% used for services to the membership such as the NUCLEUS, monthly programs, special programs and workshops, safety programs, and professional and public relations. The quality of these programs is high, and the major budgetary problems involve setting priorities among them.

Trustee

James A. Kaufman

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

Professional Background: Instr., W.P.I., 1966-69; Res. Assoc., Holy Cross, 1970-71; Sr. Res. Chemist, Dow Chemical, 1973-77; Assoc. Prof., Curry College, 1977-82; Prof., Curry College, 1982-; Dir., Lab Safety Workshop, 1981-; Lab Safety Consultant.

ACS Activities: Member, Council Committee on Chemical Safety, 1979-88; Division of Chemical Health and Safety, 13 yrs; Division newsletter editor, 1 year; Membership comm., 6 years, Chairman 1986; Division Chairman, 1988; Developed letter on lab safety from ACS President to college presidents. Northeastern Section: Councilor, 1982-87; Alternate Councilor, 1981, 1988-90; Auditor, 1981; Chairman, Health and Safety Comm., 1978-; Editor, Nucleus safety column, 2 years; Chairman, Safety Symposium for NERM-8; Safety Symposia for Mass Safety Council Annual Meeting, 1978, 1981, 1988; Moderator, Hazardous Waste Symposium, Simmons College, 1984; Nominating Committee, 1985; Workplace Chemicals Conference, May 1986.

Statement: Over the past 12 years, I've had the opportunity by serving on the Board of Directors to learn much about the operation and direction of our section. I am honored to have been invited to be a candidate for Trustee of the Section. If elected, I would work to maintain the sound financial status of the Section. I would endorse activities and expenditures which serve the members and the public.

James D. Morrison

Associate Vice President for Research and Professor of Chemistry, University of New Hampshire. Ph.D. 1963, Northwestern; NSF Postdoctoral Fellow 1962-3, Stanford. As a research administrator, I have experience with budget procedures, financial statements, fund accounting and related elements associated with the management of resources. As a teacher, researcher, consultant, entrepreneur, author and editor, I have had experience with many aspects of the chemistry profession. Sound financial management skills, a love for the profession and a desire to see the Section play an aggressive role in expanding public awareness about the importance of chemistry are the qualities I would offer the membership as a Trustee.

Phyllis A. Brauner

When the Nominating Committee asked whether I wished to be renominated for a second term as Trustee I declined for what appeared to be good and sufficient reasons. When circumstances changed, it was suggested that I be nominated by petition. Surprisingly enough, I think that I know how to operate the business of the trustees. It didn't come easily: Our treasurer Jim Piper spent several hours with me, our consultant Dick Handrick did the same, and also the immediate past chairman of the Trustees, Art Obermayer—I thank them all. As a result of all their efforts we have been able to present a simple but, I believe, intelligible report and pictograph to help ourselves and the Board of Directors to understand the flow of monies in the endowment and the various trust accounts and thus the source and extent of our available cash. I would hope to continue to increase the available cash for operating expenses by judicious selections for our portfolio combined with other selections for continued growth of the endowment and the trust funds.

Councilor/Alternate Councilor

Ernest I. Becker:

ACS Member '41. Northeastern Section: Member of 1st Safety Committee, Chmn. '69-'72; Chmn. '72-'73, Councilor '69-'77; Board of Directors '81-'85 (?); Chmn. Northeast Regional Meeting (NERM 8) '78. NY Sect.: BD '63-'65; Councilor '57-'65; Alt. Councilor '54-'56; Metropolitan Long Island Subsection; Chmn. '61-'62; Org. Disc. Group Chmn. '60-'61. Natl. Offices: Council Policy Committee '73-'78 (voting, elective position); '64-'66 (non-voting); several additional CPC Subcommittees; Comm on Chemical Safety '63-'73; Chmn. '70-'72; Committee on Technician Activities '71-'75; Comm. Chem. Ed. '60-'65, Chmn. '64-'65; Rep. to NFPA Comm. on Chem. Labs. '68-'73. Divisions: DIVCHAS; Secy-Treas '77-'78; Councilor '81-'83. AIC: Member '48; Northeast Region 1982. NYAS: Fellow, Chmn. Organometallic Chemistry Division '66-'67. Consultancies: Hexagon Labs.; GAF; Anasco; Air Force; NSF Ed. Div.; expert witness.

Statement: I am challenged by the responsibilities of Councilor.

1. Bringing the thoughts of the NES to National and bringing back actions of Council to the NES.

Ernest I. Becker (continued)

2. I am intrigued by the educational initiative for the Society as a whole as stated by Pres. Gassman and will work towards ways to expand the NES's already impressive effort in this area.

3. Working with units of the public is a daunting task, but I believe more can be done in this area as well. I wish to be elected so that I may work towards these goals for the NES.

4. As Convenor of the Retired Chemists Association, I am already contributing to the professional life of senior chemists and will continue to do this.

Michaeline F. Chen

Education: Clarke College B.A.; Boston College M.S.

Experience: Currently serving as Research Chemist in Materials Science Branch of the Emerging Materials Div., Army Materials Technology Laboratory, Watertown, MA. During the previous 10 years, consisted of work in Surface Science, Environmental Chemistry, toxic Waste Analysis, Laboratory Quality Control, Solid State Science.

ACS Activities: (1) Elected Councilor of NEACS 1987-90. ACS member since 1976. (2) Member on both Economic Status Committee and Council Committee on Public Relations of the National American Chemical Society. (3) Chairman of the Hospitality Committee NEACS 1984-87 and also of the IUPAC meeting in Boston, August, 1987. (4) Member of the Nominating Committee, 1988. (5) Chairman of the Public Relations Committee 1988 and 1990 National Meeting. (6) Chairman of Summerthing 1990. (7) Member of the organizing and planning committee for the April 1990 National Meeting in Boston. (8) Member of the Board of Directors NEACS 1984-present.

Statement: As an active councilor of NEACS for the past three years, I have taken my duties and responsibilities very seriously. If elected, I shall continue to extend our Section's influence on national policy decisions, to increase the interaction between our Section and The National Society, to promote new and interesting programs at the Section meetings and to increase the involvement of the membership in its activities. I would sincerely appreciate your support and your vote that I may continue to serve you as a Councilor.

Arno H.A. Heyn

B.S., Ph.D. (1944) U. of Michigan, Analytical Chemistry. Chemistry Prof. emer., Boston U.

Service in ACS: Member since 1940. Served on many committees of the Northeastern Section, Chairman 1969. Councilor 1967-. Council Policy Committee, 1986-, Vice Chairman, 1987-8, Subcommittee on Constitution and Bylaws; Council Committee on Constitution and Bylaws 1980-85, chairman 1983-5; Council Committee on Memb. Affairs, 1968-72, 1974-9, Secretary 1970-2, 1974-9. Currently chairman of the NESACS Committee on Const. and Bylaws, Editor of the NUCLEUS since July 1989.

Statement: Councilors are the representatives of the members to the National Society and serve as the link between members in Local Sections and Divisions and the national officers and staff. The ACS performs many functions: Scientific publications, advising Congress and other governmental bodies on legislation and rules which involve chemistry or the chemical profession,

promoting interchange of information via meetings, such as the 1990 Spring Meeting in Boston, promoting good science teaching at all levels, to name just a few. As a councilor, and especially as a member of the Council Policy Committee, the steering Committee of the Council, I shall promote effective action by the council. The two positions, Editor of the NUCLEUS and councilor mutually reinforce each other: As councilor I gain a better understanding of the current concerns of the ACS and as editor I will be in a better position to make these concerns known to the members of the Section.

Martin Idelson

Ph.D. 1955, Children's Cancer Research Foundation 1954-7, Polaroid Corp. 1957-85, Shipley Co, 1985-; Fellow, Society of Photographic Scientists and Engineers. The ACS local Section provides several important functions:

1. It maintains a liaison with high schools to expose students to aspects of the chemical field they could not get readily. This is important to attract people into chemistry as a livelihood. I strongly support this activity.

2. The monthly meetings bring excellent speakers. The members can learn more about their own fields and can broaden their knowledge. The level of these meetings is high and I would strive to maintain or improve their quality.

3. The special meetings that honor researchers and teachers must be continued.

4. Chemistry and chemicals are regarded as polluting and dangerous menaces to everything from food to the air we breathe. While there has been some basis for these perceptions, it is extremely important that they be corrected, and the beneficial aspects of chemistry be widely publicized. The local section should try to establish strong ties to the press to enhance the public's image of chemistry.

Doris I. Lewis

B.S., Duke University, 1965; Ph.D., Tufts University, 1972. Academic appointments: Newton College of the Sacred Heart, 1970-75; Suffolk University, 1975-present; currently Professor of Chemistry. ACS member since 1965; member AAAS, AOAC, NEACT, NSTA/SCST, Sigma Xi. NESACS activities: Continuing Education Committee, 1979-81; Student Affiliate coordinator, 1978-present; Chemical Education Committee 1978-present; 1990 National Meeting Committee.

Attending meetings of the Board of Directors as Student Affiliate Coordinator, I have come to have an appreciation of the work of the Northeastern Section and how I might make a contribution. The Holiday Lectures and the high school forensic science presentations during Chemistry Week have been enormously successful, and serve as a model for other sections of how a positive view of chemistry can be communicated to all ages. Mike Strem as chairman this past year made a ground-breaking effort to include college-age students in Section activities like the Statehouse reception for legislators with Clayton Callis. If the chemical profession is to remain healthy in the years to come, activities like these which foster the next generation of scientists should continue to have high priority. Work still remains to be done in involving the Section membership more broadly in its activities. As councilor I would work with the Board and within committees to do so, as well as seeing that the views of the membership are adequately represented on the national level.

John L. Neumeyer

Education: B.S. Columbia University (1952); Ph.D. (Medicinal Chemistry) (1961) University of Wisconsin

Professional Experience: Research Chemist, Ethicon (Div. of Johnson & Johnson) 1952-57; FMC Corp., Sr. Research Chemist 1962-63; Arthur D. Little, Inc., Sr. Staff Scientist (1963-69); Professor of Medicinal Chemistry and Chemistry, Northeastern University 1969-present; Visiting Professor of Chemistry, University of Konstanz, W. Germany, 1975-76; Visiting Scientist, McLean Hospital, Harvard Medical School, 1985-86; Scientific Director and Chairman, Research Biochemicals, Inc. 1980-present.

ACS Activities: Founder and Chairman, Medicinal Chemistry Group, N.E. Section 1964-5; Division of Medicinal Chemistry—Councilor, Executive Committee 1971-81, Vice Chairman 1981, Chairman 1982, Councilor 1983-87; N.E. Section—Councilor 1988-present, Trustee 1989-present.

Statement: Having served the American Chemical Society in a variety of functions over the past 26 years, most recently as Councilor and Trustee of the Northeastern Section, I have become keenly aware of the problems and concerns of its members both on the local and National scene. If elected, I will continue to devote my energies and experience in furthering the objectives of the Society and its members.

Donald O. Rickter

Education: University of California, Davis, AB and MS; Michigan State University, Ph.D.

Experience: 2 years as U.S. Navy Hospital Corpsman; 3 years H.S. and college teaching; Polaroid Research (Scientist since 1964; Information Scientist since 1978).

ACS Activities: Member since 1953; Congressional Science Counselor (8th District, Mass.) since 1974; Liaison between the Northeastern Section and Polaroid since 1974; Program Committee 1981; Board of Publications 1983-85; Alternate Councilor 1985-present.

Statement: Each of us needs to work on communicating better. We can solve many problems as chemists and as citizens when we share our abilities. The public has some negative impressions of chemistry that will not go away if we are silent, neglecting our responsibilities to inform people. One of my concerns is the future of Chemical Abstracts Service. It is moving away from the understanding and "user-friendliness" of working chemists. Its powerful tools should be more useful than they are now. The Northeastern Section is unusually rich in talented chemists who need opportunities to interact socially and professionally. They can make their society and their local section great by active participation.

Myron S. Simon

Education: Harvard University, Ph.D. **Professional Experience:** Scientist to Associate Director of Organic Chemistry to Research Fellow, Polaroid Corporation, 1949-88. President, Image-Ination Associates, 1989-present.

ACS Activities: Northeastern Section Chairman, 1985; Acting Trustee, 1987; General Interest Program Chairman, ACS Boston Meeting, 1990. Committees: Professional Relations, Chairman, 1987-present; Budget, 1985-88; Program Chairman, 1984;

Nominating Chairman, 1986; Long Range Planning, 1985-87; Esselen Award, 1986-present, Chairman, 1986-88. Associate Editor, NUCLEUS, 1989-present. Alternate Councilor, 1984-6, 1988-present.

Statement: We have tried to improve the image of chemistry by using the Esselen Family grant to set up and administer an award to show the public the good side of chemistry. This work continues. We are trying to improve the NUCLEUS with better articles and photographs. This work continues. By reactivating the Professional Relations Committee I have worked to help the members of this Section with problems related to professional employment such as job loss, early retirement options, pension plans. I hope to be re-elected in order to continue this work by representing the members of the Section at the national ACS level.

Nominating Committee

Iclal S. Hartman

Professor and Chairwoman of the Chemistry Department, Simmons College; Chair of the Membership Committee of the Northeastern Section.

David M. Howell

B.S., 1945, Univ. of Calif.; M.S., 1947, Ph.D., 1952, Univ. of Michigan. Have been Chair: Hospitality, High School Exam., Public Relations, Board of Publications, Budget Committee; Editor of the Nucleus, Section Treasurer, Councilor, and most recently, Secretary.

Richard Milius

Richard Milius received his undergraduate degree at Marquette University (B.S., 1972) and was employed as a research chemist at Miles Laboratories and New England Nuclear Corp. He received the Ph.D. in organic chemistry from Northeastern University in 1981. From 1981 to 1984 Dr. Milius was a Research Associate in Radiation Therapy at Harvard Medical School. Since 1984, he has been Technical Director at Research Biochemicals Inc. of Natick, MA. He has been chairman of the Northeastern Section's Medicinal Chemistry group and organized the group's symposium on the Chemistry of Learning and Memory in January, 1989. He was a member of the organizing committee for the national ACS meeting in Boston. Dr. Milius also teaches undergraduate Organic Chemistry in Northeastern University's part-time division, University College.

Michael E. Strem

President, Strem Chemicals, Inc. **Education:** A.B. Brown University (1958), M.S., Ph.D. University of Pittsburgh (1961, 1964). Current ACS activities: Councilor, Division of Small Chemical Businesses; Chairman, Subcommittee on Ethics, Committee on Professional Relations. Northeastern Section activities: Chairman, 1989.

Norris Award Committee

Elmer E. Jones

Education: University of Chicago, Ph.B. (1948), S.B. (1950); Washington University (St. Louis), Ph.D. (1957).

Experience: Museum of Science and Industry (Chicago), Technical Demonstrator (44, 46-50); Washington University (St. Louis) Teaching/Research Assistant (50-55); The Thannhauser Laboratory of the Boston Dispensary, Tufts University, Research Associate (55-58); Northeastern University, Assistant Prof. (58-62), Associate Prof. (62-90); Chelsea College, The University of London (80). Books (5). Speaker: Dept. of Education Activities, ACS (74-87); James Flack Norris Speaker, NESACS (73-87). Reviewer: various publishers and J. Chem. Ed. Before retirement, taught organic, general, and biochemistry.

Peter Pappas

Boston University Ph.D. Chemistry Department, University of Massachusetts Boston.

Jayant N. Sane

I received my Ph.D. (1973) from the Mass. College of Pharmacy, majoring in medicinal chemistry. After post-doctoral work (1973-5) at Northeastern University, I joined the Gillette Co., where I am presently a Program Chemist. I have teaching experience of over seven years and industrial experience of fifteen years. I have published ten scientific papers and one patent. I am also a member of the ACS since 1973.

Marco H. Scheer

B.S., Biochem, Tufts University, 1940; M.Ed., University of N.H., 1949. Coordinator of Science (retired), Nashua, N.H. schools; former Summer School Lecturer in Chemistry, Tufts University. Nashua Board of Education, 1977-83, President, 1981-83. Chair, Board of Publications, NESACS, 1959. President, N.E. Association of Chemistry Teachers, 1955-57, Trustee, 1977 to date. Recipient General Electric Science Fellowship, 1946; Elizabeth Thompson Award of the American Academy of Arts and Sciences, 1956; John A. Timm Award of the N.E. Association of Chemistry Teachers, 1976. Assistant to the Director, Chemical Bond Approach Project, 1961-63, and Contributor to CHEMICAL SYSTEMS.

Summerthing 1990

Newport Revisited 100 Years Later

sponsored by the Northeastern Section of the American Chemical Society & the New England Division of the American Institute of Chemists.

Where: Newport Rhode Island

When: August 3,4,5 1990

Background: It was just exactly 100 years ago that the American Chemical Society met at Newport, Rhode Island at which time they authorized the formation of the local sections of the ACS. It was for this reason that the Summerthing Committee decided to revisit Newport to pay homage to our roots. It will be a very exciting time for those of you who were at that meeting to revisit Newport to see how much and how little Newport has changed in the intervening years.

Program

Accommodations: Rooms with bath at Salve Regina College on a first reserved basis. When these accommodations are filled up, the overflow will be assigned to dormitory type facilities.

continued on page 19

Richards Medal Award Address

Chemical Reaction Rates—Theory and Experiment

by Ikuo Koyasu*

Interaction between theory and experiment plays an important role in chemistry, said Professor Rudolph A. Marcus as he accepted the 31st Theodore William Richards Medal for Conspicuous Achievement in Chemistry on March 8, 1990.

He said he was impressed by the importance of experimental results in developing a theoretical area. "How rich nature seems to be in comparison with many of us theoreticians!" he said. He spoke to an audience of about 80 at Harvard University's Science Center.

Citing many examples from his work, he declared that experiments provide a rich base of phenomena for the development of theories, and that theories help experiments by inter-

preting and predicting experimental results.

Marcus added two other factors that influence scientific work: chance and the role of other people. He discussed in some detail how he accomplished his work, including the RRKM theory and the electron transfer theory.

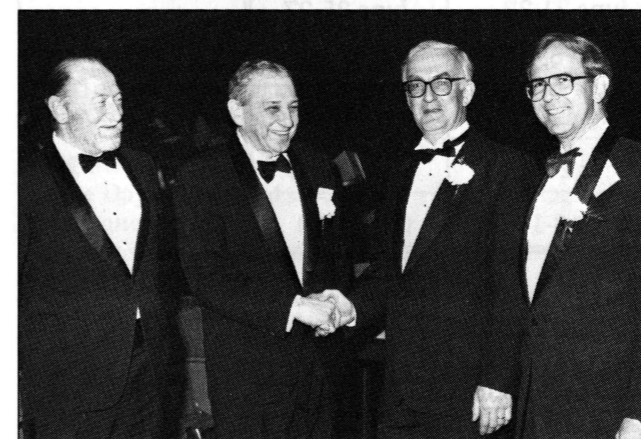
Prof. Marcus is a native of Canada. Since 1978 he has been an Arthur Amos Noyes Professor of Chemistry at the California Institute of Technology.

He is known for his work in many fields of theoretical chemical kinetics. He is one of the contributors to the RRKM (Rice, Ramsperger, Kassel, Marcus) theory, which is known as a standard, highly successful, statistical

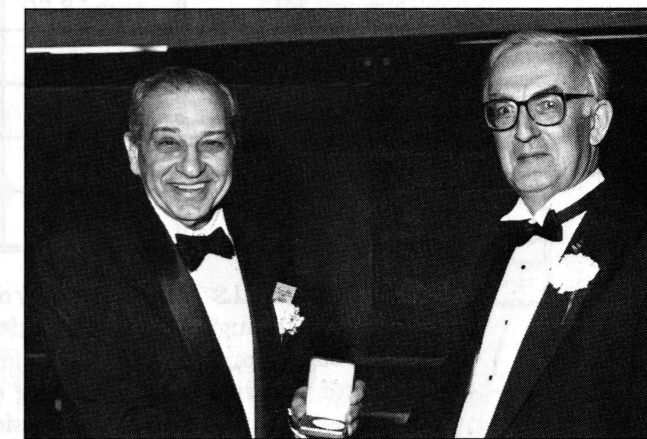
theory of unimolecular reactions. His other work includes theories of electron transfer reactions, electrode reactions, and various other transfer reactions; the semiclassical theory of collisions and of bound states, and collision coordinates.

The Richards Medal has been awarded by the Northeastern Section of ACS every other year since 1932. It is named after Theodore William Richards who was a Nobel Prize laureate and a professor of physical chemistry at Harvard. ◇

* Ikuo Koyasu is a student in the Program for Reporting in Science and Medicine at Boston University, a master degree program in the School of Communications, Adrienne Dey, coordinator.



L. to r.: Dietmar Seyferth, Rudolph A. Marcus, E. Joseph Billo and Roy G. Gordon at the Richards Medal Award Meeting.



Prof. Rudolph A. Marcus receives the Richards Medal from Chairman E. Joseph Billo. (Photos: A. Fingland)

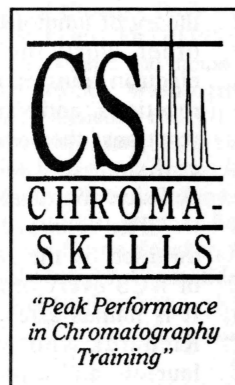
NEACT Annual Summer Conference

The New England Association of Chemistry Teachers is proud to announce its Fifty-Second Annual Summer Conference on August 13-17th at Fairfield University. The theme for this year's conference is

Chemical Instrumentation

Theme speaker will be Dr. Theodore Williams of Wooster College, Wooster, Ohio. Dr. Williams' expertise has been recognized by many, including the Award for Excellence in Teaching which is cosponsored by the ACS Division of Analytical Chemistry and the DuPont Company.

Dr. John MacDonald of Fairfield University is chairing the program of speakers. Registrations are being handled by James Harris, 50 Dover Street, Keene, NH 03431.



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Summerthing 1990

continued from page 16

Schedule of Events

Friday 3 August 1990
Start: 12:00 noon Drop your bags at Salve Regina. Check in time is 3:00 PM. We will move your bags to your room as they become available.
12:00-1:00 Lunch Salve Regina
1:30 PM Trolley Tour of Historic Newport.
3:30-5:30 Free time.
5:30-6:30 A Wine and Cheese Tasting or Beer and Pretzel Tasting or Both.
6:30-8:00 Dinner
8:00-9:00 Talk Either "Winemaking or "Entrepreneurship in the Beer Industry"

Saturday 4 August 1990
Breakfast
9:00 Technical Sessions: (Speakers followed by open discussion)
9:00-10:30 The Chemist and Environmental Issues
10:30-12:00 Perestroika/Glasnost/Gorbachev and the US Chemical Industry
10:00-11:00 Spouse Session - Dahlias
12:00 Lunch
2:00-4:00 Newport by Sea
6:00 - Clambake (with Lobster!!)

Sunday 5 August 1990
Breakfast
10:00-12:00 Mansion tour
12:00 Checkout time and Fond Farewells

Registration and Fees

Three Days: Room, Meals, Events - **The WORKS!! - \$145 (Double Occupancy)**

(If you insist on living alone, add \$50.00)

Saturday Only: Meals and Events - \$50

Please complete the attached form and mail to Karen Piper prior to 15 June 1990. Reservations are on a first-come-first-served basis. Prime accommodations are limited. The overflow will be assigned to dormitory accommodations (Salve Regina style and that's not bad!!)

Notes:

1. The Summerthing Committee expects attendees to find their own roommates.
2. The rooms with bath will be filled on a first-come-first-served basis. The Committee recommends that attendees get their reservations in early.
3. There will be a children's program(s) available — tailored to age groups when we find out who, what ages, and how many.
4. In the unlikely event that there are not enough participants to meet the minimum requirements (and that has yet to happen), your registration fee will be returned the day after the deadline for receipt of registration.
5. The Committee regrets having to urge you to meet the deadline; but as you can see from the agenda there is much to be done once we have received your commitment.
6. The Committee notes that the "quality" of the Newport Revisited 100 Years Later meets or exceeds that demanded for the Gordon Research Conferences. Indeed they will be moving a conference out as we move in and moving one in as we move out.
7. For further information please contact Ms. Karen Piper.

Summerthing 1990 Registration

Name(s): _____

(*If children, indicate age. A separate program will be available)

Address: _____

City State Zip

Phone: _____

3-day Option: \$ 145 per person:
Room, meals, events. How Many?

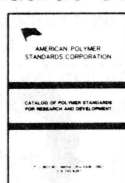
1-day Option (Saturday): \$50/person:
Meals, events. How Many?

*Children under 18: *a la carte*, pay on arrival but reserve now.

Enclosed is a check for \$ _____
to cover the above reservations.

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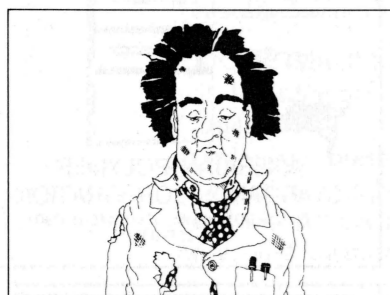
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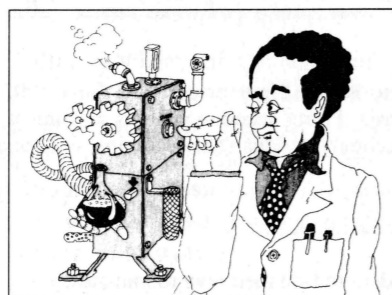
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Member News

by Katie Stygall and Phyllis Brauner

We have some very happy news: *Bette Bridges* of Silverlake High School in Plymouth was married on February 18th to Ken Brody of Brockton High School. Bette has recently been trained as a "lead teacher" for an ACS project aimed at improving chemistry teaching. With the aid of an ACS-produced laser disc — "Doing Chemistry", Bette will be training new teachers in the art of teaching chemistry. We are sorry to be saying goodbye to *Tom Greenbowe* of Southeastern Massachusetts University who will be joining the chemistry department at Iowa State University in Ames in September. Before leaving us he will be running two events for middle and high school science and mathematics teachers. On May 15 and 16 at SMU, there will be workshops for science and mathematics teachers, respectively. The morning sessions will be devoted to speakers from industry and the afternoon session to presentations from presidential awardees in science and mathematics. In July Tom will be organizing a Summer Institute for middle school science teachers sponsored by the National Science Foundation and the National Science Teachers Association. The institute will run from July 8 to July 27. Successful applicants will receive three graduate credits and a stipend of \$700. For information on either of these events, please call Tom Greenbowe at (508) 999-8245. *Dorothy Stumpf* of Middlesex Community College organized a two year-college chemistry conference that was held on April 20 and 21. *Laurence McGowan* who heads the highly praised Grandteacher program in Marlborough and Hudson spoke at the mini-conference held at Boston University on March 5 on the Grand Teacher Program which uses retired science teachers to inspire elementary school classes. Larry McGowan was at the State House on Chemistry Day, April 25. He showed his demonstrations to a small class of elementary school children with their teacher. ◇

The Coast is Not Clear

The study and regulation of coastal water pollution in Massachusetts

by Adrienne S. Dey

All is not well under that beautiful ocean surface so many of us enjoy in Massachusetts. From my house in Onset I have had a perch on a cove of Buzzards Bay for the past five years and to my distress I have noticed changes in that period of time: on breezy days the whole shore is now lined with a layer of whitish to brown foam which looks to me like something that should be in my washing machine and not in the cove; large quantities of a green seaweed that looks like fiberglass when dried wash up on the beach with the tide; eel grass stands (which grow below the low tide line) appear to be decreasing and huge masses of dead eel grass wash up on the beach daily, choking the cord grass which grows in the intertidal zone and which actually keeps the beach from washing away.

I was very interested therefore to learn of the Fifth Annual Boston Harbor & Massachusetts Bay Symposium sponsored by the Massachusetts Bay Marine Studies Consortium to be held on January 25-26, 1990 at the New England Aquarium. The first day of the symposium was to be devoted to reports on recent research in physical oceanography, biological and chemical processes, public and ecosystem health, and policy sciences. The second day would feature a status report on Boston Harbor and Massachusetts Bay followed by a discussion of issues for the future, especially how clean the harbor will—or should—be.

I was only able to attend the morning session on the first day but I learned a lot nevertheless. I was especially impressed to see such a large gathering of scientists and regulators talking together in the same room. It was also heartening to see a new generation of enthusiastic and articulate graduate students involved in the truly

interdisciplinary field of marine environmental science.

The Massachusetts Bays Program

The waters of Massachusetts and Cape Cod Bays are the end of the line for sewage, street runoff, and hazardous materials poured into household and industrial drains. Pollution gets around: once in the water, it spreads over hundreds of miles of shoreline belonging to different communities, sometimes across state lines.

One source of help is a new state and federal effort known as "The Massachusetts Bays Program" which was started in 1989. This is a cooperative program of the Mass. Office of Coastal Zone Management (CZM) and the U.S. Environmental Protection Agency (EPA).

The purposes of the program are to:
— examine the cause and effects of bay pollution, then
— design a regional management plan for the waters and land areas that affect them.

Funding for the program comes from a trust fund established after the settlement of a lawsuit between local communities, the EPA, and the Commonwealth over pollution of Boston Harbor. The program has \$1.6 million available to fund initial activities. It is hoped that this money will serve as seed money for an extended effort within the National Estuarine Program (an EPA program to promote prudent management of nationally significant bays). Marine science research projects are presently funded at U. Mass./Boston, the N.E. Aquarium, Woods Hole Oceanographic Institution, and the University of New Hampshire.

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The Coast Is Not Clear

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I cannot help but marvel at the cynicism of President Bush who during the campaign made much hay with his foray onto Boston Harbor with his "sewage meter" but who has, at this writing, once again eliminated funds for the harbor cleanup from the federal budget. The Massachusetts congressional delegation will once again have to do battle to restore these funds. In case they should fail, we should probably consider building an outfall pipeline all the way to the White House!

The MWRA's Harbor Studies Department

The Massachusetts Water Resources Authority (MWRA) has created its new department of Harbor Studies to undertake a scientific analysis of exactly how the harbor has suffered and to document any im-

provements in the quality of harbor life during the planned cleanup. Harbor Studies works together with university scientists and regulatory agencies to identify gaps in our understanding of the harbor and Bay, and supports and participates in research to fill in those missing pieces. The MWRA should then be able to plan its pollution control projects to maximize environmental benefit at the lowest cost.

Monitoring projects have been established in three areas:
— Combined Sewer Overflows (CSO): combined sewers carry both sewage and stormwater and will overflow into the harbor and tributary rivers during heavy rains. I became painfully aware of this phenomenon some years ago because the Wellesley Extension Sewer (which carries waste from Wellesley and beyond all the way to the harbor) was close to my previous house in Needham. Work to replace the undersized pipe of this line with a much larger one is now blasting its way through Dedham and Need-

ham. I will never forget the time we went canoeing on the Charles River in a section off Winding River Rd. in Wellesley to inspect a flood on the river and found ourselves in the midst of a gushing stream of sewage!

— Sludge Abatement: sludge is the solid matter which settles out in the treatment tanks of the sewage treatment plants and it is presently discharged into the harbor with the outgoing tide at President Roads. It is planned that by 1991 this sludge will be used instead to make fertilizer, leading to a significant improvement in the quality of the harbor. Sludge presently in the harbor is being studied in a point effort of the N.E. Aquarium, the Mass. Audubon Society, and several universities and public agencies.

— Outfall: this is the effluent which remains after the sludge settles out and floatable pollution is skimmed off. By 1995 it is planned that the outfall will be discharged through a nine-mile long pipe into water 120 feet deep in Massachusetts Bay. The present program is designed to provide information about the conditions at the proposed outfall site so that the impact of effluent discharges can be determined.

Contaminated sediment research: toxic contaminants are introduced by poorly treated sewage, sludge discharges, and CSOs and tend to stick to particles which eventually sink to the harbor floor. The ultimate fate of these toxins is not well understood. A grant of \$500,000 to Harbor Studies from EPA supports research in this area. Whether contaminants will be released back into the water column or stay put in the sediment once harbor water becomes cleaner is a most interesting question.

Reports on Current Research

Studies on inorganic species were presented at the symposium by graduate students from the laboratory of Gordon Wallace at U. Mass./Boston. Since it is necessary first of all to understand the distribution of trace metals in relatively unpolluted areas, a

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The Coast Is Not Clear

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site in the Gulf of Maine was studied to a depth of 140m. The data obtained from the vertical water column are comparable to some previously reported for the western North Atlantic. The effect on trace metal concentrations of a layer of biological material containing chlorophyll which appears in the spring and is located at a depth of 20m is striking: Zn, Fe, and to some extent Cd concentrations all show minima in this area. The isotope ²³⁴Th also follows the same pattern. Maxima are observed in the deepest samples and may be explained in terms of resuspension and/or advective processes. Less than ten percent of Cu, Cd and Ni exist in the particulate state. Most of the Pb and Zn are also in the dissolved state while most of the Fe is present in particles.

Sampling inside Boston Harbor at two different locations (one in a shallow cove near a CSO and the other 1.5km from the Nut Island treatment plant) showed significantly higher concentrations of metals and marked seasonal variations over 22 months. Ni, Zn, and Cd tended to show increased concentrations in the winter when there is no removal mediated by biological particles and when there may be release from sediments stirred up by storms. Pb and Cu in most cases showed increased concentrations in the summer, perhaps because of more efficient removal by sediment in the winter. Studies continue on all these complicated equilibria.

Serial dilutions of primary treated sewage with Mass. Bay water showed that a large percentage of particulate sewage bound copper desorbed upon equilibration in the solution. Furthermore, Cu seemed to accumulate at the air-sea interface as a complex with surfactants. Calculations show that the proposed sewage outfall line may lead to an increase of 150-250% in copper concentrations in the surface waters of Mass. Bay. Since the sea surface microlayer serves as a habitat for

abundant forms of flora and fauna, including the larvae and eggs of commercial fish, shellfish, and crustaceans, such a change is likely to have a very adverse impact.

A detailed study of the Merrimack River is also in progress. While upstream locations agree with background data for metal concentrations, downstream locations often exceed water quality criteria. Since the Merrimack Estuary supports commercial shellfish beds and commercial and sport fishing, significant loading of metals in these areas could have very detrimental effects. It is also important to determine whether the river is an important contributor of metals to the waters of Mass. Bay.

Conclusion

Space does not permit a summary of the many other papers presented at the symposium. Anyone interested in attending the next one should call the Mass. Bay Marine Studies Consortium at 617-282-6540.

Buzzards Bay is under the wing of the Buzzards Bay Project which is funded by EPA and is run out of the Lloyd center for Environmental Studies, 430 Potomska Rd., P.O. Box 7037, S. Dartmouth, MA 02748. Call them at 508-990-0505 to join and receive their calendar and informative newsletter in the Buzzards Bay Project.

If all proceeds as planned, we may indeed have a much healthier coastal environment by the year 2000. I think that it is also very important to put more effort into the environmental education of shorefront property owners and the boating public because an awful lot of pollution occurs simply because of a lack of knowledge. Let us give those ospreys, just recently off the endangered species list in Massachusetts, a really swell place to fish in and we will all be better off for it. ◇

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Harvard University (Chemistry) (617) 495-5333
Northeastern University (617) 437-2822
Tufts University Health Sciences Campus (617) 956-7000
University of New Hampshire (603) 862-1550
University of Lowell (Polymer Series) (508) 934-3687

Tuesday, May 1

Professor Peter Kelly (University of California, Davis)
"Spectroscopy and Dynamics of Free Radicals"
Northeastern University
Hurtig Hall room 129 at 4:00 pm

Dr. Joan Rudderman (Harvard Medical School)
Title to be Announced
Tufts University Health Sciences Campus
De Blois Auditorium A at 4:00 pm

Thursday, May 3

Professor Rama Bansil (Boston University)
"Diffusion in Gels"
University of Lowell
Olney 428 at 3:30 pm

Thomas Verhoeven (Merck)
Title to be Announced
Dartmouth College
107 Steele at 10:30 am

Monday, May 7

Professor Dudley Williams (Cambridge)
"Molecular Recognition by Peptides"
Harvard University
Mb-23 at 4:16 pm

Professor Anatol M. Zhabotinsky (National Institute for Hematology, USSR)
"Chemical Oscillation and Waves. History and Problems"
Brandeis University
Gerstenzang 122 at 4:00 pm

Tuesday, May 8

Dr. Beverly Teicher (Dana Farber Cancer Center)
"Platinum Complexes as Therapeutic Agents for the Treatment of Solid Tumors"
Northeastern University
Hurtig Hall room 129 at 4:00 pm

Professor Norman L. Allinger (University of Georgia)
"Recent Work in Molecular Mechanics"
University of New Hampshire
Iddles Auditorium Parsons Hall room L-103 at 11:00 am

Dr. Stephen Benkovic (Pennsylvania State University)
Title to be Announced
Tufts University Health Sciences Campus
De Blois Auditorium B at 4:00 pm

Dr. Dudley Williams (University of Cambridge, UK)
"Molecular Recognition by Peptides"
Brandeis University
Gerstenzang 122 at 4:00 pm

Thursday, May 10

Dr. Nathan Schneider (Materials Technology Laboratory)
"Diffusion and Relaxation in Elastomer"
University of Lowell
Olney 428 at 3:30 pm

Friday, May 11

Bruno Zimm (UCSD)
Title to be Announced
Dartmouth College
106 Steele at 2:30 pm

Thursday, May 17

Paul Lahti (UMass)
Title to be Announced
Dartmouth College
107 Steele at 10:30 am

Monday, May 21

Professor Stuart Schreiber (Harvard University)

"Immunoorganic Chemistry: The T Cell Arm"
Brandeis University
Gerstenzang 122 at 4:00 pm

May 21, 22

Dr. Leo A. Paquette (Ohio State University)
Northeastern University
Hurtig Hall room 129

"Carbonyl Functionality Regeneration with Structural Emblishment. Applications to Natural Product Synthesis." May 21, 4:30

"How Cyclooctatetraenes do Their Things. Insight into the Structural Changes Adopted During Dynamic Ring Inversion and Bond Shifting" May 21, 6:30

"Synthesis of Potential Tumor Promoters and Tumor Inhibitors" May 22, 4:30

Wednesday, May 23

Professor John Knox (University of Edinburgh, UK)
"Capillary Electroseparation — Analog of Capillary GC for Liquids"
Brandeis University
Gerstenzang 122 at 4:00 pm

Thursday, May 24

Dinshaw Patel (Columbia)
Title to be Announced
Dartmouth College
107 Steele at 10:30 am

Thursday, May 31

William Dailey (Penn)
Title to be Announced
Dartmouth College
107 Steele at 10:30 am

Notices for the Nucleus Calendar should be sent to:

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