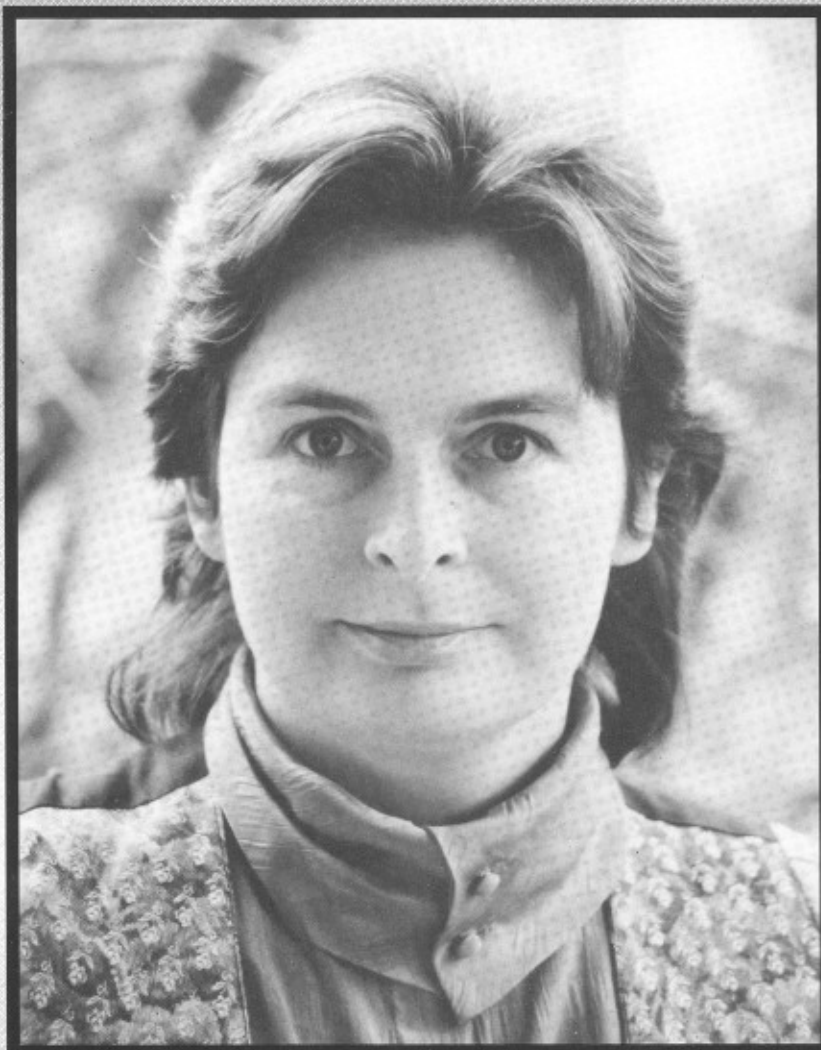


the **Chemist**

American Institute of Chemists, Inc. • January 1993



Dr. Margot O'Toole
1993 Ethics Award Recipient

AIC's 1992 Election Results
AIC Selects Second Ethics Award Recipient
1993 Chemical Pioneers
1993 National Meeting

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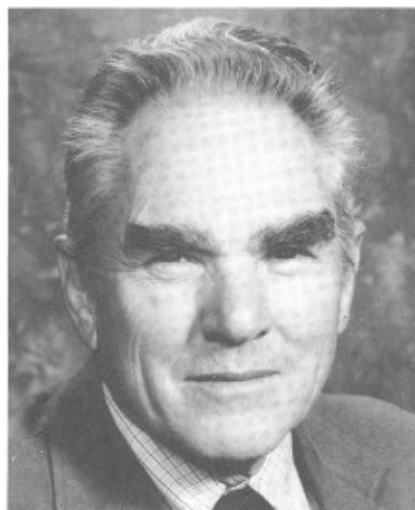
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INSIDE THIS ISSUE:

This issue of *THE CHEMIST* contains additional information on AIC's 70th National Meeting site, program, and particularly, the award recipients and the reason for their nominations. Other points of interest include the 1992 Election Results, New Members since June, 1992 and information of other companies which may be useful to AIC constituents, and much more.

the President speaks



Dr. E. Gerald Meyer
AIC President 1992-93

In this issue of *The Chemist* you will learn the details about the 70th National Meeting. One aspect is the very distinguished group of individuals who will be our 1993 Award winners. These include two Nobel Laureates and two other very distinguished scientists as Chemical Pioneers; and a most deserving Ethics Award winner, Dr. Margot O'Toole. Since each of these individuals will give an award address, those five talks alone will be more than enough to warrant your attendance. The Gold Medalist is yet to be confirmed. In addition there are two days of programming to address the professional interests of all chemical scientists.

By the time you read this the Executive Committee will have met and approved a budget for 1993. As I said in my December essay we have gotten the National Office "lean and friendly."

Thus the Executive Committee will be focussing the Institute's entire effort for 1993 on those programs and activities of interest to you, the AIC members. Your dues money is intended to provide you with two things the AIC uniquely offers: (1) the prestige of belonging to the one association that has as its first priority putting the "chemist" in "chemist"ry, and (2) providing those activities that serve the professional interests of the chemical scientist. We will be highly responsive to any ideas or suggestions you may have to accomplish these two goals.

Finally, on behalf of the AIC officers and staff I wish each of you a great Holiday Season and a healthy, happy New Year.

E. Gerald Meyer, Ph.D., FAIC
President

The AIC ELECTS NEW OFFICERS AND DIRECTORS

The American Institute of Chemists, Inc. (AIC) has elected the following Officers and Directors: Treasurer, Dr. William E. Hanford, Jr., Principal of Elixir, Inc.; Secretary, Dr. Roger R. Festa, Associate Professor of Chemistry, Northeast Missouri State University; five Directors were elected, Dr. Elizabeth A. Nalley, Professor of Chemistry, Cameron University; Dr. Thomas O. Passell, Electric Power Research Institute; Dr. Attila E. Pavlath, U.S. Department of Agriculture; Dr. David W. Riley, Consultant, Plastic Processing; and Dr. Nancy K. Wilson, Chief, Human Exposure Research Branch, U.S. Environmental

Protection Agency. The Officers will serve a two year term, four Directors will serve a three year term, and one Director (replacing Dr. Althuis due to resignation) will serve for one year beginning January, 1993. Dr. Marguerite L. Leng will be vice chair and Dr. Robert M. Milton will continue on as chair of the AIC Board of Directors for 1993.

1993 Board of Directors

Dr. Robert M. Milton, FAIC, Chair '93
Dr. Marguerite L. Leng, FAIC, Vice Chair '93
Dr. E. Gerald Meyer, FAIC, President '93
Dr. Roger P. Maickel, FAIC, President-Elect '93
Dr. William E. Hanford, Jr., FAIC, Treasurer '94
Dr. Roger R. Festa, FAIC, Secretary '94

Directors:

Ms. Carolyn E. Damon, FAIC '93
Mr. Elliott Weinberg, FAIC '93
Dr. Elizabeth Ann Nalley, MAIC '93
Dr. Kenneth Abate, FAIC '94
Dr. Edith M. Flanigen, FAIC '94
Dr. Attila E. Pavlath, FAIC '95
Dr. Nancy K. Wilson, FAIC '95
Mr. Jack E. Benham, FAIC '95
Mr. David W. Riley, FAIC '95
Dr. Thomas O. Passell, FAIC '95

The AIC Board of Directors, Members and Staff would like to sincerely thank the Officers and Directors who went off the Board, as of December 31, 1992. Your interest, support and service to The Institute has been instrumental in the progress we've made in the last few years. It would have been, otherwise, difficult to survive without your intuitiveness. Thank you.

AIC SELECTS 2ND ETHICS AWARD RECIPIENT



The American Institute of Chemists' Ethics Award Committee, chaired by Dr. Attila E. Pavlath selects Dr. Margot O'Toole to receive the 1993 Ethics Award. Dr. O'Toole will be the second individual to receive the award since its inception in 1990. Dr. O'Toole of the Genetics Institute in Cambridge, MA, was chosen for pursuing relentless integrity and truth in science disregarding the effect of her perseverance on her own personal, professional and financial standing. The award will be presented during the 70th National Meeting of The Institute, Friday, March 12, 1993. There will be a reception from 6:30-7:30 PM. Immediately following will be an Ethics Award Banquet and Presentation where Dr. O'Toole will receive a plaque and a \$500 travel allowance.

Dr. O'Toole was a junior scientist at the Massachusetts Institute of Technology and in 1986 she discovered that an important research paper in immunology recently published in the prestigious journal *Cell* was seriously flawed. Even though the senior author of the paper was a Nobel Laureate cell biologist, she did not hesitate to bring the problem to the attention of senior scientists and institutional officers at MIT and Tufts University. While her evidence was straightforward and her arguments clear, unfortunately, the response was an attempt to muzzle her.

Dr. O'Toole was unbending and in the following crisis she lost her job at the laboratory. She had to take leave from science and work as telephone operator to sustain her family. However, she did not quit even after a National Institutes of Health investigation concluded that there was "no evidence of fraud, conscious misrepresentation, or manipulation of data. . .". She recognized that some unpublished, allegedly contemporaneous data produced during the NIH investigation as supportive of the questioned research, had not existed at the time of the earlier institutional investigation. This forced the NIH Office of Scientific Integrity to open up the investigation again and Dr. O'Toole cooperated actively, openly and willingly with the team of investigators. At this time, the

investigative team came to the conclusion, through forensic and statistical analyses, that the supporting unpublished laboratory data were fabricated and after years of struggle finally Dr. O'Toole was vindicated. The paper was retracted and the senior author issued a *pro forma* apology to Dr. O'Toole.

Dr. O'Toole suffered in many ways for her determination to stand up for integrity in science. The loss of her job is only one of the many prices she had to pay for her activities. Dr. O'Toole's actions and determination were heroic in many respects. Her fight was the scientific equivalent of the David and Goliath confrontation. Her courageous stand in defense of truth in science which risked her livelihood and career, resulted in a resounding reaffirmation of the vital principle that science must always be conducted honestly and reported truthfully. The scientific community owes a most sincere thanks for her sacrifices.

In 1990 the AIC became the first association of chemists to develop a national ethics award to recognize an individual who has made outstanding contributions to ethics in the chemical field. The award was given to the AIC and is sponsored by Mr. Joseph B. Hyman, FAIC and is member of the New Jersey Institute of Chemists (NJIC). The award was initially planted in the NJIC in 1989. Mr. Hyman sug-

gested at that time that it be a national honor in order to focus wider attention on AIC's commitment to high standards of professional ethics, as exemplified by its unique Code of Ethics. It was determined by the AIC Board of Directors and Mr. Hyman that the award will be presented at the National Meeting.

The award will be given to an individual who:

- Performs duties dictated by ethical considerations in the face of difficulties for the benefit of the public and/or workers in chemistry and chemical engineering;
- Displays leadership in an organization's ethical relationships with the public and/or employees in the chemical field;
- One who teaches, researches, and/or have authorship in professional ethics; or
- Performs effective advocacy of organizational and/or governmental policies relating to chemistry that encourage ethical treatment of individuals.

Anyone may nominate an individual for this award by submitting the nominee with supporting documentation to The AIC, 7315 Wisconsin Avenue, Suite 502E, Bethesda, MD 20814-3209. Nominations for 1994 are open. Contact AIC for more details.

Other AIC Accomplishments

The AIC launched a 1992 Membership Campaign Drive in June/July 1992. There was a new brochure and a more concise new application form designed for the mailing, which accompanied a letter from the President. The annual dues rates for 1993 increased by a very minimal margin and all members who want to continue to receive the Professional Directory must pay a \$5 assessment fee, as approved by the AIC Board of Directors.

Also approved this year was a new member category "Associates." Associ-

ates are individuals who do not qualify for Member status but share AIC interests and goals. As a general rule, associates may have non-scientific occupations in a chemistry-related field. Ultimately, we have made various changes for the convenience in the maintenance of our current members, and professional attractiveness in order to grasp interest of potential members.

Lastly, there has been an AIC sponsor a member program developed for AIC members who may know of colleagues, friends, and/or faculty who may be interested in becoming a member of The Institute. See more details in this issue.

Sponsor members now and get your complimentary membership now or bank it for another time.

Listed below is an updated list of new AIC members—June through November 20, 1992. The AIC Members, Board of Directors, and Staff would like to officially welcome each of you. Welcome and thank you for your support!

New Members since June 4, 1992

Sudhir Agrawal
Merrill P. Anderson-Ashcraft**
Carl J. Abraham*
Burton M. Altura

Continued on page 23

1993 CHEMICAL PIONEERS

Each year The American Institute of Chemists recognizes four prominent innovators in the world of chemical science during its National Meeting. This year members of the AIC will celebrate their 70th National Meeting, March 10-14, 1993 at the Hyatt Regency New Brunswick, New Jersey. At the 1993 Chemical Pioneers Program, moderated by Dr. Frederick J. Karol, Chemical Pioneers Awards Committee chair, each recipient will present a paper reviewing his pioneering work. The program will

be held on Saturday, March 13, from 9 AM-12 Noon. Immediately following the program there will be a Luncheon and Awards Presentation, 12 Noon to 2 PM dedicated solely to the selected Chemical Pioneers. The luncheon guest speaker will be Dr. Roger R. Festa, Professor, Department of Chemistry, Northeast Missouri State University.

The 1993 Chemical Pioneers are: **Dr. Bruce Merrifield**, Professor, The Rockefeller University (Nobel Prize in Chemistry, 1984); **Dr. Derek H. R. Barton**,

Professor, Department of Chemistry, Texas A & M University (Nobel Prize in Chemistry in 1969); **Dr. Jule A. Rabo**, Professor and retired from UOP; and **Dr. George A. Olah**, Director, Loker Hydrocarbon Research Institute, and Loker Distinguished Professor, University of Southern California.

The following is a list of the award recipients and their citation/formal statements of achievement for receiving this honor, along with a brief biographical sketch on each.

Dr. Bruce Merrifield: For his pioneering studies in peptide synthesis which have brought about a revolution in peptide and protein chemistry whereby hundreds of different peptides have now been synthesized.

Dr. Bruce Merrifield is Professor at the Rockefeller University and winner of the 1984 Nobel Prize in Chemistry. He is a biochemist whose research has greatly advanced the field of peptide chemistry and its application to biological problems. In addition to the Nobel Prize, Dr. Merrifield received the Lasker Award for Basic Medical Research, the Nichols Medal, and the Josef Rudinger Award and was elected to membership in the National Academy of Sciences. His publication list is both long and distinguished. Among his most important papers are the ones reporting his method for solid-phase peptide synthesis and its use in the synthesis of the pancreatic ribonuclease. His methodology has greatly stimulated progress in biochemistry, immunology, endocrinology and medicine.



Dr. Jule A. Rabo: For his pioneering work in zeolite catalysis, particularly the discovery of the strong-acid Y zeolite catalyst compositions, which provided the scientific basis for the commercial development of these catalysts in catalytic cracking and hydrocracking processes used throughout the world.

Dr. Jule A. Rabo, recently retired from UOP and formerly of Union Carbide, is the author of 51 scientific papers and 61 U.S. patents. He is the recipient of numerous national and international awards in catalysis, including the ACS 1988 E.V. Murphree Award and the Catalysis Society's 1989 E.J. Houdry Award, to recognize his contributions in zeolite catalysis to industrial and engineering chemistry. He has been a frequent lecturer on catalysis and surface chemistry at national and international conferences and has been an active spokesperson for catalysis research and development on a world-wide basis.



Dr. Derek H. R. Barton: For his pioneering studies in conformational analysis, biogenetic aspects of phenol oxidation, hormone synthesis, deoxygenation of secondary alcohols, new radical chain reactions, and numerous others which have influenced all branches of chemistry including the chemical industry.

Sir Derek Barton is Professor, Department of Chemistry at Texas A&M University. His distinguished services to chemistry through his outstanding and significant contributions both to the original literature and to the training of several generations of chemists have been remarkable. He was awarded the Nobel Prize in Chemistry in 1969. The awards he has received which are too numerous to mention include the 1989 ACS Award in Synthetic Organic Chemistry. His contributions have continued undiminished for five decades and continue to move organic chemistry in new directions.



Dr. George A. Olah: For his pioneering studies in carbocation chemistry, electrophilic chemistry of alkanes, and the use of superacids which have led to numerous applications of useful and significant new synthetic reagents and methods.

Professor George A. Olah is Loker Distinguished Professor of Organic Chemistry and Director of Loker Hydrocarbon Research Institute at the University of Southern California. He has over 950 published scientific papers, 100 patents, and numerous books. George Olah has been recognized with many awards including the ACS Roger Adams Award in Organic Chemistry, the ACS Award for Creative Work in Synthetic Organic Chemistry, and the ACS Award in Petroleum Chemistry. His pioneering chemistry cuts across the conventional boundary of inorganic and organic chemistry and his methods are widely used by everyday working chemists around the world.



The Chemical Pioneers Awards program began in 1966 by the AIC, primarily to add a technical component to its meetings. It has grown since then and has become not only an integral part of the annual gathering of AIC members, but also an important award in U.S. chemical science. The award recognizes chemists, chemical

engineers, or their associates who have made outstanding contributions which have had a major impact on advances in chemical science and industry and/or the chemical profession. In addition to their plaques, recipients are also given one year's complimentary membership as an Institute Fellow.

The award selections are made by the Chemical Pioneers Awards Committee, all of whose members are former Chemical Pioneers Award recipients.

Nominations for 1994 will be announced in an upcoming issue of *THE CHEMIST*.

THE AMERICAN INSTITUTE OF CHEMISTS
70th National Meeting
Hyatt Regency Hotel, New Brunswick, N.J.
March 10-14, 1993

PRELIMINARY PROGRAM

Wednesday, March 10, 1993

9:00 AM - 11:00 AM	Finance Committee meeting
11:00 AM - 12:30 PM	AIC Foundation Trustees meeting
12:30 PM - 2:00 PM	OPEN—LUNCH
2:00 PM - 4:00 PM	Planning Committee meeting
4:00 PM - 7:00 PM	Executive Committee meeting

Thursday, March 11, 1993

9:00 AM - 12:00 Noon	Board of Directors meeting—Session I
12:00 Noon - 2:00 PM	Local Institutes Luncheon meeting
2:00 PM - 5:00 PM	Board of Directors meeting—Session II
5:00 PM - 8:00 PM	Registration
6:30 PM - 7:30 PM	WELCOMING RECEPTION
7:30 PM - 10:00 PM	Board of Directors Dinner

Friday, March 12, 1993

8:00 AM - 5:00 PM	Registration
9:00 AM - 5:00 PM	CONCURRENT SESSIONS: Symposium A "Innovations in Pharmaceutical Packaging I" Symposium B "Chemicals, The Environment, and The Pharmaceutical Industry"
9:00 AM - 12:00 Noon	Symposium A " Innovations in Pharmaceutical Packaging I " Moderator: Prof. Hugh Lockhart, Ph.D. , Michigan State University
9:00 AM - 9:45 AM	"Shelf Life of Pharmaceutical Products" Prof. Seymour G. Gilbert, Ph.D. Dept. of Packaging Engineering, Rutgers University
9:45 AM - 10:30 AM	"Physical Chemical Qualification of Unique Pharmaceutical Containers and Components" Bernard L. Williams, Ph.D. , R.W. Johnson Pharmaceutical Research Institute, Raritan, NJ
10:30 AM - 10:45 AM	Break
10:45 AM - 11:30 AM	"Determination of Off-odor or Potential Migrants in Pharmaceutical Packaging by Short Path Thermal Desorption" Mr. John Jay Manura , Scientific Instrument Services, Ringoes, NJ Thomas G. Hartman, Ph.D. , Center for Advanced Food Technology, Rutgers University
11:30 AM - 12:15 PM	"FTIR Microscopy and UV Spectroscopy in the Study of Pharmaceutical Packaging and Formulations Interactions" James B. Johnson, Ph.D. , T. Roshdy, Ph.D. , and J. Spingler , Hoffman-La Roche, Nutley, NJ
9:00 AM - 12:00 Noon	Symposium B " Chemicals, The Environment, and The Pharmaceutical Industry I " Invited Speakers: Larry Adrian , Schering-Plough Research Ken Semel , Hoffmann-La Roche, Inc. Dorothy Bowers , Merck, Sharp & Dohme
12:15 PM - 2:00 PM	Luncheon
1:15 PM - 2:00 PM	Luncheon Speaker: Ms. Hollie Shaner, R.N., CGH Environmental Strategies, Inc., Burlington, VT "Disposal and Recycling of Medical and Pharmaceutical Packaging"

Friday, March 12, 1993 (cont't)

- 12:00 Noon - 2:00 PM New Jersey Institute of Chemists Luncheon
- 12:00 Noon - 2:00 PM AIC Standing Committees Luncheon meetings
- 2:00 PM - 5:00 PM **CONCURRENT SESSIONS: Symposia A & B (cont'd)**
- 2:00 PM - 5:15 PM Symposium A **"Innovations in Pharmaceutical Packaging II"**
- 2:00 PM - 2:45 PM On Tamper Proof Packaging (Title to be announced)
Prof. Hugh Lockhart, Ph.D., School of Packaging, Michigan State University
- 2:45 PM - 3:30 PM "Analytical Technique for Drug Packaging Materials"
Mrs. Heasook Kim-Kang, Xenobiotic Laboratories, Inc., Princeton, NJ
- 3:30 PM - 3:45 PM BREAK
- 3:45 PM - 4:30 PM "Material Aspects of Medical Packaging"
Lecon Woo, Ph.D., Applied Sciences, Baxter Healthcare, Round Lake, IL
- 4:30 PM - 5:15 PM "Radiation Stability of Plastics for Medical Packaging"
Mr. Elliott L. Weinberg, Technical Information Exchange, East Brunswick, NJ
- 2:00 PM - 5:00 PM Symposium B **"Chemicals, The Environment, and The Pharmaceutical Industry II"**
- Invited Speakers:
Usha Wright, CIBA-GEIGY Corporation
Mark H. Dorfman, INFORM
Edward G. Remmers, American Council on Science and Health
- 6:30 PM - 7:30 PM **ETHICS AWARD RECEPTION**
- 7:30 PM - 10:00 PM **ETHICS AWARD BANQUET AND PRESENTATION**
Black Tie Optional
- Moderator: **Dr. Attila E. Pavlath**
Chair, Ethics Award Committee
- Introduction: To Be Determined
- "Collegiality Among Scientists"
Dr. Margot O'Toole,
Genetics Institute, Cambridge, MA

Saturday, March 13, 1993

- 8:00 AM - 2:00 PM **Registration**
- 9:00 AM - 12:00 Noon **CHEMICAL PIONEERS PROGRAM**
- Moderator: **Dr. Frederick J. Karol**, Chair
Chemical Pioneers Committee
- Chemical Pioneers:**
- "The Invention of Chemical Reactions"
***Dr. Derek H. R. Barton**, Professor,
Dept. of Chemistry, Texas A & M University
- *Nobel Laureate
- "Solid Phase Peptide Synthesis and Its Application to Biological Problems"
***Dr. Bruce Merrifield**, Professor,
The Rockefeller University
- "Superacids, Carbocations and New Hydrocarbon Chemistry"
Dr. George A. Olah, Professor, Correct Organic Chemistry and Director,
Loker Hydrocarbon Research Institute, University of Southern California
- Dr. Jule A. Rabo**, Retired, UOP
- 12:00 Noon - 2:00 PM **CHEMICAL PIONEERS LUNCHEON AND AWARDS PRESENTATION**
- AIC Annual Forum: **Dr. E. Gerald Meyer**
AIC President, 1992-1993
- Presentation of Awards

Saturday, March 13, 1993 (cont'd)

Guest Speaker: **Dr. Roger R. Festa**
Northeast Missouri State University

2:00 PM - 5:00 PM	CONCURRENT SESSIONS: Symposium C "Alternate Careers for Chemist" Symposium D "The Toxicology of Asbestos"
2:00 PM - 5:00 PM	Symposium C "Alternate Careers for Chemist" Symposium D "The Toxicology of Asbestos"
2:00 PM - 2:30 PM	"The Toxicology of Serpentine and Amphibole Asbestos" Dr. Brook Mossman, M.D. , University of Maine
2:30 PM - 2:55 PM	"Toxicology of Asbestos and Cigarette Smoking" G. H. Miller, Ph.D. , Director, Studies on Smoking
3:00 PM - 3:30 PM	BREAK
3:30 PM - 3:55 PM	"The Legal Aspects of the Toxicology of Asbestos and Lung Cancer" Edward Houff, ESQ. , Church & Houff
4:00 PM - 4:25 PM	"The Legal Aspects of the Toxicology of Asbestos and Methothelioma" John Fitzpatrick, ESQ. , Wright, Robinson, McCammon, Osthimer & Tatum
6:30 PM - 7:30 PM	GOLD MEDAL RECEPTION
7:30 PM - 10:00 PM	GOLD MEDAL BANQUET AND AWARDS PRESENTATION <i>Black Tie Optional</i>

Sunday, March 14, 1993

12:00 Noon - 3:00 PM	Registration
12:30 PM - 2:30 PM	Student Poster Session
3:00 PM - 6:00 PM	NJIC 42nd Annual Honor Scroll Presentation and Student Awards Banquet

AIR TRANSPORTATION

The AIC has made arrangements with two air carriers to ensure its members and participants get the most efficient, cost-effective travel to its March 10-14, 1993 National Meeting as possible. The Irvine Travel Service in West Lafayette, Indiana will arrange air and ground transportation for AIC's attendees from the Newark Airport. Irvine Travel Service has secured a special conference discount with Trans World Airlines (TWA) beginning March 8 thru March 16. The discount reflects an additional 5% off all coach and most discounted fares. You must meet all restrictions for the fares that are in effect on the date of ticketing (many super-saver rates need to be purchased at least 14 days in advance and require a stay over a Saturday night.) Irvine Travel Service would like to remind all travellers that fares are not guaranteed until actually ticketed.

*******It is imperative that you book your reservations early for the**

least expensive fares.***** For those areas not served by TWA and for international attendees, Irvine Travel will be happy to arrange the most economical airfare possible. Irvine Travel will also arrange your ground transportation from the Newark Airport to the Hyatt Regency New Brunswick with ICS Limo Service. The one way rate is \$19.00 and \$38.00 round trip. Advance reservations must be made and tickets are purchased at time of bus departure. Simply tell the ICS driver you are attending the AIC National Meeting at the Hyatt Regency New Brunswick.

Please contact Cathy Mellady or Kate Korte regarding this travel program. Call Irvine Travel Service Toll-free at 800-467-4777 between the hours of 9 AM to 5 PM Eastern Time. You may also contact them via FAX: 317-743-2123 or telex 4950449. Or write: Irvine Travel Service, 127 Northwestern Avenue, West Lafayette, IN 47905.

USAir

USAir has been designated as the other official carrier for AIC attendees during the National Meeting in New Brunswick, New Jersey. USAir/USAir Express currently offers over 80 flights daily into the Newark International Airport. Of course, USAir Frequent Traveler members will earn a minimum of 750 Frequent Traveler miles when flying on USAir to the meeting. Travel is valid on USAir between March 8-16, 1993.

To obtain the most current flight and fare information, call the USAir Meeting and Convention Reservation Office at 800-334-8644, 8:00 AM-9:00 PM, Eastern Time. Once your reservations are confirmed, USAir will mail the tickets to you or suggest several other convenient methods of purchase. If you normally use the services of a travel agent or corporate travel department, please have them place the call for you **REFER TO GOLD FILE NUMBER 19300040.**

THE AMERICAN INSTITUTE OF CHEMISTS, INC.
70TH NATIONAL MEETING
MARCH 10-14, 1993

HYATT REGENCY HOTEL —NEW BRUNSWICK, NEW JERSEY

REGISTRATION FORM

Registration is necessary for admission to all meeting sessions and social functions. All registrants must wear their badges for entrance to any AIC function.

Name _____
(Please print name as you wish it to appear on badge.)

Professional Affiliation _____

Address _____

City _____ State _____ Zip Code _____

Phone: Office _____ Home _____

Spouse/Guest _____
(Please print name as you wish it to appear on badge.)

REGISTRATION FEES (Check appropriate category):

	Early Bird	After February 18	Write-In Total
___ AIC member	\$75.00	\$100.00	_____
___ Non-member	\$95.00	\$125.00	_____
___ Retired/Emeritus member	\$40.00	\$ 50.00	_____
___ AIC Student Associate	\$12.00	\$ 15.00	_____
___ Other Students	\$15.00	\$ 20.00	_____
___ Daily AIC member	\$50.00	\$ 60.00*	_____
___ (Circle 1: WED, THURS, FRI, SAT)			_____
___ Daily Non-member	\$60.00	\$ 70.00*	_____
___ (Circle 1: WED, THURS, FRI, SAT)			_____
___ Advisor w/2-4 Students	\$55.00	\$ 60.00	_____
___ Advisor w/5-9 Students	\$60.00	\$ 70.00	_____
___ Advisor w/10 or more Students	\$70.00	\$ 80.00	_____
___ Spouse/Guest	\$15.00	\$ 20.00	_____

All participants registering on a Daily basis must circle the day you are planning to attend. *To be Paid on-site.

Students are required to show school identification. If you wish to join AIC and pay the member rate, please complete the application form included in this issue and mail with registration form. If you are registering students please attach list of names.

Social functions are an additional fee as identified below. Please indicate number of tickets desired.

	#		Total
Local Institutes Luncheon, March 11	_____	\$15.00	_____
Welcoming Reception, March 11	_____	\$ 7.00	_____
Ethics Award Banquet, March 12	_____	\$37.00	_____
Chemical Pioneers Luncheon, March 13	_____	\$18.00	_____
Gold Medal Banquet, March 13	_____	\$42.00	_____

Cancellations: All cancellations made in writing by **February 25, 1993** will be reimbursed in full. All cancellations between **February 25 - March 3, 1993** will be reimbursed at 50%. There will be no reimbursements after **March 3, 1993**.

- My check payable to: AIC National Meeting is enclosed.
 Please charge on my (check one): VISA or MasterCard

Card # _____ Print name as it appears on charge card _____

Expire Date _____ Signature _____

Please return Registration Form with remittance to:
 The American Institute of Chemists
 7315 Wisconsin Avenue, Suite 502E
 Bethesda, MD 20814-3202
 Phone: (301) 652-2447
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The Forensic Chemist As An Expert Witness

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Chemists working in forensic laboratories frequently spend a substantial amount of time testifying in court as an expert witness or preparing to testify in cases which are about to be tried. However, few, if any, chemistry majors receive any training for this task or are even apprised of the possibility that they might have to be involved in such activities during their professional life.

An expert witness is an individual who by virtue of his education and experience:

1. Can supply the court with information, relative to the case in question, which would not generally be expected to be within the knowledge of the trier of fact.

and

2. Has been declared by the presiding judge to be qualified as an expert in a particular field or limited area of knowledge.

An expert differs from a fact witness, i.e., someone who has firsthand knowledge of facts in the case, in that he is allowed to express his opinion based on facts which have previously been presented as evidence.

In order to be declared an expert witness the individual's qualifications must be pertinent to the subject under consideration in the case being tried. In a recent case in Federal Court a defendant was charged with interstate transportation of 1200 pounds of marijuana. The prosecution called as a witness a drug chemist who had performed analyses to positively identify the material as marijuana. The defense presented as a potential witness a very respected Ph.D. biologist who had an extensive curriculum vitae, was a member of a number of professional societies, and had published numerous articles; none of this with any relation to controlled substances.

The proposed defense witness had dried several samples randomly selected from the evidence and had calculated that on a dry weight basis the evidence would weigh less than 800 pounds, which would have resulted in a lesser penalty under Federal Statutes. After listening to the presentation of the proposed witness' credentials, and subsequent cross examination by the prosecuting attorney which showed that he had no experience with controlled substances, the judge ruled that he would not be accepted as an expert, and would not be allowed to testify.

The key to successful testimony is

education and experience, attention to detail, and preparation.

I. Education and experience

The chemist must have, and be able to demonstrate that she has, the appropriate formal knowledge and training which qualify her to perform the analyses in question and to interpret the results. A forensic chemist, in addition to her formal schooling, will generally have worked under the supervision of an experienced forensic chemist, and will have demonstrated her capability in the particular area(s) in which she is to work. She will have demonstrated proficiency in performing the laboratory functions as well as a working knowledge of the pertinent literature. She will also have reworked cases completed by more experienced chemists or worked cases in parallel with these mentors.

An additional aspect of forensic training is continuing education and participation in seminars and professional societies. Peer reviewed publication of articles relative to her work or developments is desirable as one measure of her acceptance in the field.

The chemist should compile a curriculum vitae organized in such a way as to permit the attorney who is presenting her as an expert to emphasize those details which are relative to the case in question. This should include schooling, training, work history, length of service, publications and presentations, various types of courts and approximate number of times she has testified, and any other features which will demonstrate her expertise.

II. Attention to detail

Maintain an intact chain-of-custody: It is essential to be able to document everyone who had possession of any physical evidence, why they had possession of it, when and from whom it was received and when and to whom it was transferred, and where and how it was stored from the time of being received from the accused until the appearance in court and subsequent disposition of it. If there is any missing link in this chain-of-custody (COC) then there can be a legitimate question as to whether the evidence presented to the court is in fact the evidence received from the accused. If this question is serious enough, the case may be lost for that reason alone. The chemist is part of this COC and has responsibility to assure that it is intact through his receipt, possession and transfer of the evidence, including that

which may have been consumed in analysis. He cannot be responsible for the COC before and after his possession; however, he must be meticulous in preserving that part of it over which he has control.

Of particular concern is the unequivocal identification of the evidence. This may be accomplished through a description of its unique features, unique markings placed on it, or if it is in a container, sealing with a tamperproof seal, such as evidence tape, and dating and signing or initialing across the seal in a manner which would indicate any tampering. At trial this evidence may be handed to the expert witness for identification, and he must be able to do so.

Choice of methods of analysis: In order to assure that an accused is not unjustly brought to trial through an analytical deficiency, and to be able to adequately support their testimony at trial, the chemist must be certain that the results are beyond question. In analyzing controlled substances, for example, they may choose to perform one or more screening tests, e.g., color tests or thin layer chromatography; however, they must be aware that these are not definitive and should only be used to eliminate negative samples or to provide information for a presumptive positive. As a final analysis a method which provides molecular structural information, usually mass spectrometry or infra-red spectroscopy, is required for confirmation. In addition they must have sufficient knowledge and skill to describe to the lay people of the jury what they have done and the significance of it in terms which the jury can readily understand.

If the chemist has been judicious in their choice of method, and their performance of the analysis they will establish a reputation for reliability, and will not frequently receive serious challenges to their conclusions. However, they must not be lulled into a sense of false security, as one instance in which they are shown to be in error can damage that which takes many years to build.

When possible, it is desirable not to consume all of the evidence in analysis. An accused in some cases may choose to have independent analyses performed. If all of the evidence is consumed then this should be recorded.

Detailed records: The term "forensic" is derived from the Latin "forum" and today means suitable for, or susceptible to, use in courts of law or public disclo-

sure and/or debate. The forensic chemist must keep in mind that any evidence on which he works may subsequently lead to an appearance in court. This may be within days or weeks or it may not be for years. He obviously cannot and cannot be expected to remember the details of the work he may have done relative to that evidence. It is therefore imperative that he develop and religiously maintain a system of recording information which will allow him to reconstruct the events which lead him to his conclusions. Chain-of-custody has been mentioned; however, his case file must include any and all chromatograms, spectra, photographs, worksheets and notes upon which he has relied. This file must be maintained in a manner which will not only allow him to justify his conclusions, but must be such that a qualified independent examiner may review and understand it. This may be requested by the accused and ordered by the court.

If corrections are made they should be lined through so that the original entry is readable, and then the correction must be signed or initialed and dated. A note as to why the correction was required is frequently necessary. No erasures or obliteration of original entries are acceptable.

III. Preparation

Any forensic chemist who has not prepared for trial should be considered derelict in his duty. This preparation has several aspects.

First, he must thoroughly review his file so that he is familiar with all aspects of it. He does not want any surprises on the witness stand, and he does not want to make errors which may detract from his appearance of competence. It is preferable, if possible, to testify without reference to notes. Any materials which the chemist uses during testimony are subject to examination by opposing council. This should not result in any embarrassment for the witness if he has properly maintained and reviewed his file; however, it provides the attorney the opportunity to ask a myriad of questions about details which may have little relevance to the testimony, but can create a distraction from the thrust of it, i.e., a smoke screen to cloud the jurors' understanding.

Second, the expert should attempt to be certain that the attorney who has called him understands what he has done, why, and the significance. He should also be advised of areas which are not pertinent and should perhaps be avoided to minimize confusion of the jurors. The expert and attorney should be operating on the same wavelength. In some instances it is important to ascertain how the expert's testimony fits with other evidence or testimony in order to pursue the case in an orderly and effective fashion.

A third aspect of preparation frequently is to ascertain who might be cross

examining the expert and what might be expected from him as to demeanor and tactics. This is a part of mental preparation. The opposing council may request a pre-trial conference with the expert. It is the expert's choice whether or not to participate; however, it is frequently a good idea so that he may get a feel for the approach which might be taken, and demonstrate to the attorney that his work supports his conclusions and that he is not an advocate. If a pre-trial conference is held, it is the expert's right to have a witness present, to take notes, and to examine the opposing council's notes.

The expert must be both physically and mentally prepared. He should dress neatly and conservatively to present the appearance of the professional which he should be. He should speak clearly and firmly, and make eye-contact with, and address his answers to, the jury. They are the ones to whom he is trying to convey information—not the attorneys.

Mental preparation requires discipline and practice. The expert should keep in mind that he is not an advocate; it is not his duty, function, or prerogative to be concerned with guilt or innocence. He is there to provide information which may help the jury make an appropriate decision. He should also refrain from volunteering information. While he is sworn to tell "the truth, the whole truth, and nothing but the truth" that doesn't mean that he will necessarily be allowed to present all the information he may have. The expert should listen to the questions asked of him, be certain that he understands them, and then answer only those questions as concisely and clearly as possible. If he attempts to interject additional information one of the attorneys may object, or the judge may preclude him from doing so. It is good practice for the witness to hesitate prior to answering a question to allow time for an objection to be made. In addition, he should never answer a question he does not thoroughly understand. It is his right to ask that the question be clarified or that a multiple part question be divided prior to his answering.

On cross examination an attorney may try to confuse, infuriate, or intimidate the witness; or he may try to lead him into an area beyond his experience or the scope of the work he has done. It is the expert's duty to remain calm, even under difficult circumstances, and to keep in mind that these are tactics and not necessarily attacks on him personally. If the questions address areas beyond his expertise or would require speculation, he should never be hesitant to say "I don't know" or "I cannot answer that question."

It is also necessary for him to realize that jurors generally will not be familiar with some of the technical concepts or language he might frequently be inclined to use. It is essential to attempt to communicate with them in terms which they understand, without seeming to "talk

down" to them. In many instances the use of analogies and examples related to commonly encountered situations, items or procedures is very effective.

In conclusion, the expert should be thoroughly prepared and objective. He should conduct himself in a professional manner, and above all tell the truth to the best of his ability, without speculation. This can be achieved through knowledge, discipline and experience.

"Fellow members: we would like to publish similar articles concerning career choices for chemical scientists. If you like this idea please suggest or submit an article on your career."

Hyatt Regency New Brunswick

The Hyatt Regency New Brunswick is the meeting facility of The American Institute of Chemists' 70th National Meeting, March 10-14, 1993. AIC members and participants have a special room rate of \$88.00 single/double occupancy. Reservations will be held until 6 PM on arrival date unless accompanied by a deposit or an accepted credit card number and signature. NOTE: All reservations must be received by **February 15, 1993**. To make your accommodations for the AIC National Meeting, please contact the hotel for reservations at: **Hyatt Regency New Brunswick, Two Albany Street, New Brunswick, New Jersey 08901 or call direct at 908-873-1234 or Telex 833092.**

AIC participants are encouraged to arrive in New Brunswick at least one day prior to the meeting to enjoy shopping and sightseeing. While you may be searching for a building or a storefront—look no further. The minute you cross the intersection of George and Albany Streets you are in City Market, and for a twenty square block stretch in New Brunswick's downtown you'll discover some of the most unique shops, restaurants and businesses in the state.

City Market incorporated is a non-profit organization of more than 200 retailers, land and business owners, restaurateurs, cultural entities and community leaders who have agreed to tax themselves to finance essential activities to promote downtown New Brunswick. These activities include special sales and street fairs, additional maintenance and business attraction.

Come discover what City Market has to offer. You get to City Market on the "E Bus" which travels back and forth between the College Avenue campus and the Douglass/Cook campuses along George Street.

Bower Business Award Given to Dr. Arnold Beckman, Scientist, Entrepreneur, And Philanthropist

Dr. James L. Powell, president of the Franklin Institute has announced that Dr. Denis Burkitt and Dr. Arnold Beckman will be recipients of the 1992 Bower Awards for Science and Business. These awards established as part of the Benjamin Franklin National Memorial Awards program, are presented each year to a distinguished scientist of any nationality for outstanding work in the life or physical sciences and to an American executive who has demonstrated outstanding leadership in business and industry.

Dr. Beckman, 1992 Bower Award recipient for Business Leadership, founded Beckman Instruments, Inc. in 1939 to manufacture the pH meter he had invented while on the faculty of Caltech. In 1940, he invented the spectrophotometer. These two instruments improved the precision, speed, and sensitivity of scientific measurement and revolutionized the chemical laboratory. For over 50 years, Beckman Instruments has been a leader in the invention and manufacture of state-of-the-art scientific instruments. In 1982, Dr. Beckman merged his company with SmithKline, the Philadelphia



pharmaceuticals company, and found a second career as a philanthropist. Through the Arnold and Mabel Beckman Foundation, he has used his fortune to become one of the leading private patrons of science. In the past 10 years, he had given over \$170 million, mostly in multimillion-dollar grants, to leading research universities to establish institutes for interdisciplinary scientific research.

Dr. Dennis Burkitt, a surgeon and leading cancer researcher, is the recipient of the Bower Award and Prize in Science. This year the award, the richest American prize in science, includes a \$373,000 cash payment.

On January 14, 1993, a convocation ceremony will be held at the Franklin Institute. Dr. Burkitt will receive the cash prize and both Dr. Burkitt and

Dr. Beckman will receive gold medals.

The Bower Award and Prize in Science and the Bower Award for Business Leadership were made possible by a \$7.5 million bequest to The Franklin Institute by Henry Bower (1896-1988) a Philadelphia chemical manufacturer.

Dr. Beckman joined The Institute in 1957 and is currently an Honorary Fellow. Listed below is the citation of the Bower Award for Business Leadership to Dr. Arnold O. Beckman, Founder of Beckman Instrument, Inc. and Chairman, Arnold & Mabel Beckman Foundation.

Citation for the Award: For a notable career combining scientific discovery, the innovation of invaluable scientific instrumentation, and creative business leadership, including the reestablishment of Beckman Instruments as a thriving company (undertaken at a point in his career when most individuals would have retired). For his philanthropic commitment to ensuring the role of the private sector and academic institutions in the future of basic scientific research and development.

NCC Survey Results

by Dr. Connie Hendrickson,
FAIC, CPC

Results of a 1991 survey of all Certified Professional Chemists and Chemical Engineers are now available, and have provided us with some interesting thoughts. Answers to the question "Why do you like being certified?" included

- status in job and court testimony
- measure of credibility
- professional recognition
- indication of current level of training
- public and client recognition
- assessment of professional activity
- convenient way of communicating ... expertise to others
- excellent for consulting and expert witness work

Average number of years certified for those responding was 8 years. Out of 55 narrative responses, more than half mentioned professional recognition as an important part of being certified. "Professional recognition" was also the most frequent answer to *Why did you become certified in the first place?*

Economic reasons for certification included

	%
Expert witness work	36
Promotional opportunity	20
Peer pressure	10
New regulations	7
Government requirement	6
Other	21

Most respondents (58%) felt that competency exams should not be a part of certification, mainly due to difficulty and cost of administration. Examinations to demonstrate specialty were also viewed negatively (52% felt we should not have them).

Most of those responding felt that NCCCChE should cooperate with other professional societies such as the American Institute of Chemical Engineers, and the National Society of Professional Engineers, and clinical chemists, but NOT with loosely connected professions such as certified public accountants and patent lawyers.

Any suggestions on how to improve

the certification program? elicited longer and more detailed answers than any other question requiring a narrative response! Two recommendations—providing a wallet-sized card for certificatees and re-writing the instruction brochure for clarity—have already been approved and enacted by the Commissioners. Publicity outside the AIC for visibility and promotion of the certification program was suggested by several respondents, and is also underway; we are obtaining mailing lists outside the AIC, and aggressively distributing articles on certification and its advantages to newsletters of organizations in related fields. Don't hesitate to contact Macey Elliott or myself if you have an idea of a contact for a newsletter article. The National Certification program is one of the most valuable contributions of the AIC to the chemical-related professions, and we are dedicated to making it grow.

For information on the National Certification Program, contact the AIC National Office.

Government Ethics Code Mum On Associations

by Dr. Fred Ordway, FAIC

The director of the U.S. Office of Government Ethics, Stephen Potts, spoke on the work of his office at a meeting of the Professional Society Ethics Group, sponsored by the American Association for the Advancement of Science, on November 6. He reported that the proposed regulations restricting federal employees' participation in professional associations had been dropped from the Executive Branch standards of conduct, which were issued in August 1992.

The preliminary publication of the regulations produced over 800 written comments to the OGE and a storm of protests from technical societies, fearful that their members employed by the government would be precluded from taking leadership roles in their associations. Potts disclaimed any intention to restrict participation in professional activities such as organizing and participating in technical meetings. He cautioned, however, that business activities of any outside organization, including professional societies, might be incompatible with full-time government employment.

After the furor it aroused in the pre-

liminary publication, the controversial section 8.06 of the regulations was deleted in the final issuance, but reserved for possible inclusion in a future revision. The present situation regarding employees' professional associations was not considered to involve abuses requiring regulations other than the more general rules stated elsewhere in the standards of conduct.

The participation of government scientists, engineers, and other professionals in their various technical societies plays an important role in national and international communication, which the government agencies generally wish to support. For the employee, it provides the main avenue to recognition and advancement in the profession, as distinguished from the administrative hierarchy of his organization. Agency managers are wary of involvements that can, under inspection by the ignorant or unfriendly, be criticized as diversion of public resources to private interest. To walk the line between proper support of technical progress and improper use of public resources will clearly require continuous attention by agencies and

employees to ethical aspects of the relationships involved.

This aspect of the regulations was a minor part of the task of codifying more than 100 separate standards that had been developed by various agencies. The OGE began the task before Potts was appointed director, and will continue to consider possible needs for revision in the future.

In addition to issuing regulations on ethical conduct, the OGE is responsible for reviewing problems of conflict of interest, acceptance of gifts, and the like. The new regulations specify that gifts worth less than \$20 from an outsider, totaling less than \$50 in a year, or less than \$10 from another employee, are considered *de minimis*; these limits would appear to make the legendary lobbyists' entertainment a thing of the past.

The OGE director was appointed by President Bush for a statutory five-year term. He and his staff of 70 will undoubtedly be fully occupied in 1993, with the examination of conflict statements from new appointees of the Clinton administration added to the usual incidence of ethical indiscretions requiring investigation.

AIC Display Booth: Chemistry Day 1992

Reported by Ms. Carolyn R. Damon, FAIC

Chemistry Day in Chicago is sponsored each year by the Chicago Section of the American Chemical Society. It is held on the first Saturday in November, and the day is filled with demonstrations, activities, and talks related to chemistry. An exhibition is an integral part of the event.

In 1991, AIC member Stanley Seilig, active in the local ACS, suggested having an AIC informational booth in the Chemistry Day exhibit area. I borrowed the AIC portable display, but found that its height exceeded that of the exhibit hall. Unable to assemble the display, AIC member Aurora Miller and I staffed an AIC table at Chemistry Day in 1991.

This year, I was contacted directly by the ACS Chemistry Day coordinating committee and asked if I would be responsible for an AIC booth at the 1992 exhibition. I learned from Macey Elliott in August that AIC had a banner, and arrangements were made to provide me with both the banner and promotional materials.

This year's Chemistry Day was held at the Adler Planetarium in Chicago. The exhibit hall consisted of a large, open space within a permanent Planetarium display area. The Planetarium would only permit displays by nonprofit organizations. Therefore, the number of exhibitors this year (about 20 in all) was approximately half that of last year. These consisted of local colleges and universities and national organizations such as the AIC.

The location of the AIC booth was ideal, on the side of the exhibit hall leading to the Planetarium's only cafe. The AIC banner provided an excellent drape for the table, topped by the AIC tee shirts and promotional materials.

Unlike last year when there were too many participants early in the day and few later on, there was a steady flow of visitors all day with fewer present at any given time. Booth visitors consisted of high school and college chemistry students with their teachers, parents and other family, and the general

public (some were probably visiting the Planetarium, unaware of Chemistry Day).

Almost without exception, the tee shirts attracted favorable attention, and 11 of the 15 were sold. Most visitors were genuinely interested in learning about the AIC and read the promotional materials with interest. Those with particular interest took membership materials or signed the attendance sheet for additional information. Several women students showed interest in my professional experiences as a chemist.

In my opinion, displays such as this are an excellent way of informing the public, and chemistry students in particular, about the AIC. I have very much enjoyed promoting the AIC at Chemistry Day for the last two years and appreciate the support and assistance of the National Office in this regard.

Those members who may be interested in exhibition of the AIC should contact the National Office for details.

1993 Sustaining Members and Fellows

Sustaining Members and Fellows are those who commit to a higher level of dues as specified by the AIC Board of Directors. They are issued a special certificate of recognition and are entitled to a special listing in The Institute's Professional Directory. Sustaining dues is a special voluntary optional category offered annually to AIC members @ \$300. When this amount is paid, all other items listed are automatically paid, i.e., national dues, local dues, and assessments, thus individuals are granted special recognition. Any additional funds are solely a contribution to The Institute. The following are individuals who have committed to the 1993 Sustaining Members and Fellows circle of contributors:

Mr. Donald Alstadt, FAIC
Mr. Shabbir U. Alvi, FAIC
Mr. Ibriham Bedros, MAIC
Mr. Raymond Bentele, FAIC
Mr. James Clark, MAIC
Mr. Bruce Collins, FAIC
Mr. Ed Dimitroff, FAIC
Ms. Cherry L. Emerson, FAIC*
Dr. Edith M. Flanigen, FAIC
Dr. Edmund T. Funk, FAIC
Mr. Thomas Gardeski, FAIC
Mr. Larry Gatlin, FAIC*
Mr. Joseph Gregg, MAIC
Mr. A. George Holstein, FAIC
Mr. Ronald Hull, FAIC**
Mr. Joseph B. Hyman, FAIC
Dr. Joseph Jacobs, FAIC
Dr. Emerson Kampen, HonAIC
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Mr. Gary Westberg, FAIC
Mr. Michael Wilson, FAIC
Dr. Kin Ping Wong, FAIC

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**1992-1993 Sustaining Members

Congratulations and thank you for your unselfish financial support of The American Institute of Chemists and its professional programs. We greatly appreciate your good support.

AIC MEMBERSHIP REPORT

November 11, 1992

CURRENT MEMBERS

CATEGORY	08/20/92	11/11/92
Fellow @ \$96	1370	1378
Member @ \$72	598	627
Retired @ \$36 & \$48	96	107
Associate @ \$99	1	2
Emeritus Fellow	903	893
Honorary Fellow	33	32
Life Fellow	308	305
Student Associate @ \$18	198	216
Total in Good Standing	3507	3560

MEMBERS WHO HAVE PAID THEIR 1993 DUES:

CATEGORY	11/11/92
Fellow	392
Member	187
Retired	41
Student Associates	46
Total	666

MEMBERS WHO HAVE NOT PAID THEIR 1992 DUES:

CATEGORY	08/20/92	11/11/92
Fellow	191	191
Member	167	166
Retired	16	15
Student Associates	47	46
Total not in Good Standing	421	418

**Total Number of 1992 Student Awardees is 655.

TOTAL # OF DUES PAYING MEMBERS

Fellow	1378
Member	627
Retired Member	107
Associate	2
Student Associates	216
TOTAL	2330

TOTAL # DUES EXEMPT MEMBERS

Emeritus Member	893
Honorary Fellow	32
Life Fellow	305
TOTAL	1230

1993 Sustaining Members: 38

Chemical Industry Recovery: Slow but Steady

by Kenneth Abate, Ph.D., FAIC

Standard and Poor's analyst Richard O'Reilly stated in the latest forecast that the chemical industry is in for a "less than robust" business recovery. "The domestic economic recovery has been more modest than historical rebounds, and foreign economies have now also slowed, reducing export demand for chemicals and, consequently, the industry's trade surplus. Key end markets for the chemical industry are in slow growth phases, while selling prices also remain a problem. Thus, the benefits of restructuring and cost reduction actions taken by many companies in 1991 have yet to become fully apparent."

Based on S&P Stock Price index-adjusted earnings, the projections for 1993 of \$13.51 are up from the 1992 projections of \$10.15. The 1991 stock price index was \$7.48.

"Key end markets for the chemical industry—housing, automobiles and manufacturing—are generally moving sideways." Housing starts should strengthen but commercial construction should remain weak.

Automobile sales are generally flat with truck sales being up. Projections are for higher 1993 sales than 1992/1991.

"The manufacturing sector is also projected to continue to advance in 1992 and 1993. This side of the economy accounts

for about two-thirds of the demand for chemical product." A 3.6% gain is forecast in the Federal Reserve Board's Industrial Production Index in 1993 over the 1.3% rise in 1992.

Operating rates are expected to be up after declining the past two years due primarily to capacity additions. "It would appear . . . that the industry is focusing more on productivity and cost reduction programs than on major new capacity expansions." Pollution control and environmental spending continue to be spending issues.

Selling prices should continue to strengthen in 1993 but in an erratic pattern based on product.

As an aside, it appears that the bright note is in the area of quality. After taking a beating over the last several years because of poor quality, American industry in general has turned the corner. Major efforts to implement various quality programs is starting to pay off with demonstrable improvements in quality. The chemical industry in general is leading the way in quality improvement and in being a responsible industry by initiating self-regulation in the areas of environment issues, health and safety, and in employee welfare.

Membership Recruitment Contest PRIZES FOR THE 1994 ANNUAL MEETING

1st Place and Ties	(20 members or more) 5 days hotel room at the Convention Hotel and AIC Meeting Registration
2nd Place and Ties	(10 members or more) 5 days hotel room at the Convention Hotel
3rd Place and Ties	(5 members or more) AIC Annual Meeting Registration
4th Place and Ties	(4 members) 1 year AIC Annual Dues (free)
5th Place and Ties	(3 members) Free AIC T-Shirt (specify size)
6th Place and Ties	(2 members) AIC Lapel pin
7th Place and Ties	(1 member) Honorable mention

Note:

- Only AIC members who nominate members and are approved by the Q&A Committee can be counted.
- All winners will be published in the Winning Contest List in a 1994 issue of *The Chemists*.
- All prizes will be presented during the 1994 Annual Meeting. The AIC T-Shirts and AIC Pins will be mailed to the winners by February 28, 1994.
- The one member who signs up the most members will be an honored guest at the 1994 Local Institutes Luncheon.

Contest Dates: 30 days before the 1994 Annual Meeting.



Albert Thurman, Executive Director of Association of Energy Engineers (AEE) announced that **Mr. Milton Meckler**, President, Meckler Group, Consulting Engineers, Encino, California, has been chosen by its Honors and Awards Committee to receive its prestigious 1992 Environmental Professional of the Year Award. AEE confers prestigious awards each year to individuals and companies that have achieved national and international prominence in promoting the practices and principles of energy engineering and energy management.

Mr. Meckler, an engineering and construction consultant listed in the 1992 Who's Who Environmental Registry and Charter Member of Environmental Engineers and Managers Institute of AEE. He taught environmental science for several years as Adjunct Professor of Mechanical and Chemical Engineering, at California State University, Northridge, School of Engineering and Computer Science. His firm has been actively involved in environmental design for many years.

BOOK REVIEW

A Review of Enlightenment Science in the Romantic Era, E. M. Malhado and T. Frangsmyr (Eds), Cambridge University Press, New York, NY (pp. 246), 1992.

The book *Enlightenment Science in the Romantic Era* gives a dynamic portrait of Berzelius and his contributions to chemistry from a cultural perspective. Even though the book has been divided into nine sections it is not clear whether there is any logical sequence between these sections. Earlier chapters are more philosophical than later chapters where the relationship between Berzelius and his belief in classical approaches to the chemical sciences emerges. It seems that the book attempts to portray collectively how Berzelius' approaches to chemistry were different, yet unique in purpose, and might challenge or influence not only chemists but also scientists and non-scientists. While chapter three portrays Berzelius' affinity for classical atomism, chapter four relates him to instrumentalism. Also contrary to "popular" belief about chemists, the book shows how vulnerable at times Berzelius was like any other human being in his beliefs. For example, in chapter three, he had doubts (though temporary) about the

Elias J. Corey, professor at Harvard University since 1959 was nominated to receive the Roger Adams Award in Organic Chemistry. The award is to be presented during the 33rd National Organic Chemistry Symposium in Bozeman, Mont., June, 1993. The purpose of the award is to recognize and encourage outstanding contributions to research inorganic chemistry defined in its broadest sense.

His colleague describes him as "the world's undisputed leader in synthetic organic chemistry. He has literally changed the way people think about the problem of creating organic architecture. No one individual, now living, has had such a profound impact on this field."

His interest in research includes the logic of chemical synthesis; new methods of synthesis; synthesis of complex bioactive molecules; theoretical organic chemistry; organometallic chemistry; bioorganic and enzyme chemistry; the application of computers to organic chemical problems, and particularly to retrosynthetic analysis.

Corey has been recipient of several other prestigious awards, such as the Nobel Prize in Chemistry, 1990, the Japan Prize in Medicinal Sciences, 1989, and the Wolf Prize in Chemistry, 1986.

He received his Ph.D. degree in 1950 from Massachusetts Institute of Tech-

nology, where his contributions to organic and medicinal chemistry began. After receiving his degree, Roger Adams then at the University of Illinois, Champaign appointed Corey to the chemistry faculty.

He has published more than 700 publications in scientific journals and has held over 100 lectures. He is a Fellow of the AIC, the Royal Society of Chemistry, and the National Academy of Sciences, among others. He was elected membership in the AIC in 1989 and is currently a Life Fellow.

J. Stephen Duerr, Ph.D., P.E., CPC, president of Metuchen Analytical, Inc., Edison, NJ, was elected to the Board of Directors of the American Council of Independent Laboratories (ACIL). He will serve as board representative for ACIL's eastern division, beginning Sept. 21.

Duerr is a founder of Metuchen Analytical, which specializes in research chemistry and Microbiology for the plastics, pharmaceutical, and household products industries. He earned his B.S., M.S., and Ph.D. degrees in metallurgy from the Massachusetts Institute of Technology and is a registered professional engineer and a certified professional chemist of AIC's National Certification Program. He is a member of numerous other professional societies.

NOTICE TO AUTHORS

THE CHEMIST is interested in receiving original submissions from authors on topics of pertinent professional interest to chemists and chemical engineers. It does not publish papers on scientific or technical matters, except as they may represent an address by a major award recipient or technical articles on timely topics of current general interest to chemists. Submissions should not have been published or committed for publication elsewhere without the knowledge of the editors of THE CHEMIST or other such publications.

All submissions will be promptly acknowledged. They will be subject to review by the Editorial Board which, with the editor, reserves the right to alter manuscripts for style and/or space purposes. The right to reject manuscripts without reason is reserved.

Papers should be brief and desirably no longer than 800-1,000 words. Authors' names, addresses, and professional affiliations must be clearly indicated. The manuscript should be submitted in double-space, typewritten format. All illustrations and photographs must be of reproducible quality. Literature references should be included, though they may not appear in final publication if the manuscript is accepted.

Each issue of THE CHEMIST is independently copyrighted. The American Institute of Chemists, which owns THE CHEMIST, states that it does not necessarily endorse any of the facts or opinions in articles which appear therein.

Other Companies

National Collegiate Invention Competition Call for Entries

The BFGoodrich Collegiate Inventors Program wants to reward students who are engaged in research projects that may lead to patentable inventions. This national competition recognizes and rewards scientific and technical achievement by full-time college and university students in the United States. Deadline for entering the 1993 competition is February 16, 1993. For applications and further information, call Rose Heintz (216) 762-4463, or write: The BFGoodrich Collegiate Inventors Program, 80 W. Bowery, Suite 201, Akron, OH 44308.

Consortium on Laboratory Automation Creates New Program for Small Businesses

Small businesses will be able to influence the future of laboratory automation through a newly created program of the Consortium on Automated Analytical Laboratory System.

The consortium, also known as CAALS, is a partnership of government agencies and private-sector firms, whose goal is to advance automation in analytical chemistry. It is managed by the National Institute of Standards and

Technology in Gaithersburg, MD. The new program is called CAALS Associates.

The CAALS Associates Program allows small businesses to help devise specifications and standards for laboratory automation. For a \$5,000 annual fee, CAALS Associates participate in the consortium's quarterly workshops and receive relevant CAALS reports and newsletters.

The CAALS Associates Program is open to small businesses, as well as individuals, not-for-profit organizations, universities and trade associations. For more information, contact CAALS, A343 Chemistry Building, National Institute of Standards and Technology, Gaithersburg, MD 20899, (301) 975-4142.

Papers Invited for Fourth ASTM Symposium on Building Seals and Sealants

Papers are invited for a Symposium on Science and Technology of Building Seals and Sealants, to be held February 2-3, 1994 in Fort Lauderdale, FL. This symposium is sponsored by ASTM standards-writing Committee C-24 on Building Seals and Sealants and will be held in conjunction with that committee's standards development meetings on January 31 through February 1, 1994. For more information contact the symposium chairman, David Nicastro, Law Engineering, 5500 Guhn Rd., Houston, TX 77040, (713) 939-7161.

Obituaries

Howard D. Hartough, former vice president in charge of chemicals, Richardson-Merrell, Inc., New York, NY, (now Merrell-Vick), died October 7, 1992 at his home in Highland Beach, Florida. He was 79. According to the family, the cause of death was a massive stroke.

Mr. Hartough was Fellow of AIC and belonged to numerous other societies.

Horace S. Isbell, 93, a research chemist at American University and former official of the National Bureau of Standards who was a leading authority on carbohydrates, died of congestive heart failure July 1 at his home in Washington.

Dr. Isbell joined the staff of the National Bureau of Standards in 1926. He became chief of its organic chemistry section. He was notable for his work for the development under the sponsorship of the Old Atomic Energy Commission of Radioactive labels for carbohydrates. These "tagged" sugars were used to study chemical processes in living organisms.

In 1967, Dr. Isbell retired from the bureau and joined the faculty of American University as a research professor. He continued his work there under grants from the National Science Foundation. He published more than 200 papers in professional journals and books, and he held a number of patents. He was elected as a Fellow of the Institute in 1968.

Mr. Emmett Carmichael passed away on September 1, 1992. He was an AIC Life Fellow and was elected in 1951.

Dr. Joseph Jordon passed away in August, 1992. He was an AIC Emeritus Fellow and elected to membership in 1969.

Mr. Russell Bowen passed away in August, 1992 in Arlington, VA. He was an AIC Fellow and elected to membership in 1969.

Mark your calendars now for the 71st National Meeting of The Institute, March 2-6, 1994. The meeting will be held at the Indianapolis Hilton Hotel, IN. The AIC room rate is \$85.00 single or double occupancy.

1992 NCIC Student Awardee Heads to England for Year of Study

For the tenth time since the program's inception in 1959, a Duke student has won a prestigious scholarship for a year's graduate study at Cambridge University's Churchill College.

Malisa V. Troutman's selection came as no surprise to Peter Smith, the Cambridge alumnus who for 10 years has coordinated the Churchill Scholarship program on the Duke campus. "I just had a feeling she was going to be a winner," said Smith, a Duke chemistry professor. Smith recalled the footnote that the Winston Churchill Foundation's New York-based executive director penned on Troutman's application letter.

As Smith remembers it, the note read: "Your applicant seems to be about as good as your basketball team." Troutman, a senior with a "3.9 something" grade point average who is currently at the top of her class at Trinity College, will study organic chemistry during her year at Cambridge. She should leave England with the degree of master of philosophy in national science. She has already arranged what she will do after that, having won a National Science Foundation graduate fellowship that will provide \$14,000 a year and tuition for three years of studies, perhaps at MIT. An Alabamian from Dothan, she attributed her success in part to her mother Rebekah, who is project director of the local Head Start program.

"She taught me to read at an early age," Troutman said. "My mother's degree was in early childhood educa-

tion. I think she knew what she was doing." One early literary influence, which Troutman recalls reading early in grade school, changed her life. Entitled "The I Hate Mathematics Book," it was designed for children who hated boring arithmetic drills. What she learned from it were concepts like pi, probability, infinity and prime numbers, which stoked a budding fascination with math.

"I like mathematical puzzles," she said. "I like thinking analytically." Recognizing her precociousness, elementary school teachers gave her special instructions in subjects like long division. And by the time she was a teenager, she was detouring some mornings to the George C. Wallace State Community College to take calculus and other courses that were unavailable at Dothan's Northview High School.

She had attended Duke on Barry Goldwater, Robert C. Byrd and National Merit scholarships. She is a member of four honor societies, including Phi Beta Kappa, and has been a teaching assistant for Duke's Office of Minority Affairs and the treasurer for the campus Baptist Student Union.

In her junior year at Duke, she began working in the laboratory of James B. Duke Professor Bertram O. Fraser-Reid, where she helps synthesize certain compounds known to attach to cell membranes. "She is obviously very brilliant," said Fraser-Reid. She is also a very astute researcher. She is not afraid to tackle a problem. She is not flustered when things don't go right."

Her scholarship to Cambridge is funded

by the Churchill Foundation of the United States. The foundation also has a fellowship program to enable U.S. professors to do research at Churchill College.

Like the foundation, Churchill College was itself founded in 1959 in honor of the former British prime minister. Its academic program concentrates on science and technology, although about one third of its students study social science or the humanities.

Ms. Troutman was a 1992 AICF Student Awardee, Department of Chemistry, Duke University, North Carolina. As noted by Dr. Adrian Cubberley, FAIC and NCIC President "Malisa did in fact graduate at the top of her class at Duke first—not only of chemistry, but of the entire graduating class. She is now studying organic chemistry at Cambridge. Note that she worked in the laboratory of Professor Bertram O. Fraser-Reid, an accomplished and noted professor who is also a Fellow of AIC."

The AIC published a brief article for its members to encourage sponsorship of potential AIC members in the January issue of THE CHEMIST with an application form included. Please note: When submitting a nominee please remember to send either as a packet with a cover note or include your name and ID# on the application form(s) to ensure that you get full credit/recognition.

The American Institute of Chemists Foundation congratulates all 1992 Student Awards Recipients. The AICF would again like to extend its gratitude to all participating colleges and universities and the AIC Local Institutes in assisting in the implementation of this very special program. Listed below are student awardees from the Virginia, Minnesota, Michigan, South Carolina, and St. Louis Institutes of Chemists.

Student Awardees

VAIC Student Award Recipients

Amer Wahid Akhras
Lori R. Brock
James David Burgess
James Wise Culclasure
John L. Darby, III
Mark G. David
J. Sloan Downey
Carla R. Edge
David V. Greely
Celia Margaret Henry
Celeste P. Jamison
Tracy V. Johnson
Teresa Jones
Eric C. Markow
Benjamin D. McConnell

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James Madison University
Longwood College
Emory and Henry College
Virginia Military Institute
Hampton University
Virginia Polytechnic University
Hampton University
University of Virginia
University of Richmond
Hampton University
Hampton University
Sweet Briar College
Virginia Polytechnic University
Roanoke College

Student Awardees—Continued

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Shahreyar Sayyar
Morgan E. Warner
Kelly Gene Willis
Jonathan Wong

College/University

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Old Dominion University
Washington & Lee University
University of Virginia, Clinch Valley
Virginia Commonwealth University

MNIC Student Award Recipients

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Wade C. Eckhoff
Donna Frisvold
David Giesen
Chevan Goonetilleke
Brian R. Johnson
Steven J. Lange
Matthew L. Maunu
Melissa Medina
Seth A. Miller
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Joy M. Nielsen
Gordon C. Savelle
William E. Smith
Annette G. Trowbridge
Mark F. Vitha
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St. Cloud State University
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Bethel College and Seminary
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Augsburg College
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Andrew J. McKinley
Steven Miljour
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Kathleen M. Neuman
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Scott A. Shippy
Patrick A. Walker, III

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Hillsdale College
Northern Michigan University
Michigan State University
University of Detroit
Calvin College
Michigan Technological University
Central Michigan University
University of Michigan, Flint
University of Michigan
Western Michigan University
Wayne State University
Albion College
Eastern Michigan University
Grand Valley State University
Andrews University
Michigan Technological University
Wayne State University
Hope College
Lawrence Technological University

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Lynn Davis
John Andrew Deas
Jeffrey M. Eckert
James David Joseph
Thao Van Phan
Elizabeth Perry Putnam
Julie Stinecipher

University of South Carolina
Erskine College
Bob Jones University
Furman University
Clemson University
University of South Carolina
Francis Marion College
Clemson University

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Lance E. Ballard
Jamal M. Baker
Jeremy Eli Bailey
Kalyani Banerjee
Eugene G. Barron
Mark Edward Bohnert
Lynn Maureen Bormann

Southeast Missouri State University
Eastern Illinois University
Chicago State University
University of Missouri, Columbia
Northeastern Illinois University
University of Missouri, Rolla
University of Missouri, Columbia
Northeast Missouri State University

Continued on page 23



Taking Stock of Mutual Funds

by William Sullivan

Merrill Lynch

With interest rates for CDs and other savings accounts declining, people in search of an investment with the potential for higher returns may be smart to look into mutual funds.

In order to invest wisely, it's important to understand what mutual funds are and how they work. Many people have the misconception that mutual funds work as if they were a single stock. Instead, mutual funds are large pools of stocks, bonds or other securities that are chosen and managed by the fund manager. You get a piece of each company in the portfolio. Because you are buying into a "basket" of securities, your investment represents a wider segment of the economy than any single investment could.

Why Invest in Mutual Funds?

There are some characteristics of mutual funds that make this type of investment appealing. These include professional management, diversification, and liquidity.

- **Professional management.** Managing your investments can be a demanding job. As economic and political climates continue to shift at a moment's notice, investing today requires the watchful eye of a professional manager. When investing in mutual funds, you benefit from the expertise of the professional manager, who is able to monitor worldwide events affecting portfolio holdings.
- **Diversification.** Because mutual funds pool your money with the funds of other investors with similar objectives, they enable you to indirectly own a greater number of issues. And, because you are investing in a pool of securities of different issuers, the risk of owning individual securities directly can be minimized. Declines in one or more holdings may be balanced by gains in other issues in the portfolio. Most people do not have the financial resources to achieve adequate diversification on their own.
- **Liquidity.** Mutual funds provide investors with a high degree of liquidity. The price of a fund's shares is based upon the value of the underlying securities, called the net asset value. Because fund shares are redeemable, investors are able to liquidate their positions at the current net asset value at any time. Of course, because the market price fluctuates, the fund's net

asset value may be higher or lower than your original investment.

The Right Choice

Finding the right funds to meet your goals can be a formidable task: there are close to 5,000 funds from which to choose. They range from the most conservative to the most aggressive. They may, for example, invest in long-term corporate and municipal bonds, large blue-chip stocks, small growth stocks, or in cash equivalent instruments such as Treasury securities, among others. A fund's prospectus, which explains the fund's investment objectives, outlines fees and shareholder services and discloses risk factors.

In order to choose, you need to define and prioritize your investment goals and assess your tolerance for risk. What are your primary concerns: safety, current income, growth of capital, or some combination thereof?

If safety is key, a money market fund investing in short-term U.S. government securities provides income and a high degree of safety. For those willing to take a greater risk, funds offering more aggressive strategies—such as investing in high tech, growth stock or foreign stocks—may be preferable.

The return on a mutual fund investment, as well as the value of the portfolio securities, tends to fluctuate. And, as with any investment, generally the higher the yield, the greater the risk. But keep in mind there is no sure way of predicting a fund's future returns; past performance is no guarantee of future results.

One option is to invest in a "family of funds," which is a group of mutual funds offered by a particular investment manager. In most instances, you would have the option of exchanging between one fund and another as the economic climate or your investment needs change. There is usually no charge for such exchanges, although there may be tax implications, or limits on the number of exchanges you can make in any given year.

Management and Certain Other Fees

The fees associated with any mutual fund you are considering should be clearly explained in the prospectus. A portfolio manager, for example, generally will be paid in management or advisory

fee.

Some mutual funds are sold through a financial consultant, who can help you match the right fund to your objectives, and track its performance. In return, the consultant receives a commission. If the fee is paid when shares are purchased, it is referred to as a front-end load. Back-end load funds do not impose a sales charge when shares are purchased but typically are subject to an ongoing distribution fee known as a "12b-1 fee," named after an SEC rule. Some funds may have a contingent deferred sales load for several years after the shares are first sold; the fee decreases each year until it reaches zero. Some funds also charge a redemption fee if fund shares are redeemed within the first few years after purchase.

A no-load fund is one in which the investor buys shares directly from the fund company without a broker. These funds carry no sales charge, but generally have management or advisory fees.

Types of Funds

There are basically two types of funds: closed-end and open-end funds. Mutual funds are "open-end" funds, which allow an investor to buy into a fund and redeem shares at any time at the then current net asset value.

"Closed-end" funds, however, are traded like stocks, and in many instances are listed on a securities exchange. As a traded security, prices do not necessarily reflect the value of the underlying securities. In fact, depending on market demand, closed-end funds frequently sell either at a premium or a discount to the net asset value of the underlying securities.

Before investing in any fund, it's important that you carefully read the fund's prospectus and seek the recommendations of a qualified financial consultant, who can help you match your investment objectives with the fund or funds most appropriate for your unique situation. Don't let the language of mutual funds intimidate you—they can be a valuable part of your financial future.

William Sullivan is Senior Vice President and Director, Individual Financial Services at Merrill Lynch Private Client Group.

ATTENTION: AIC MEMBERS

Now AIC Members can sponsor/nominate colleagues, co-workers, and friends alike to become members of The Institute. Those members who nominate 4 individuals for membership will receive one year's membership dues complimentary (it is up to you to inform the AIC National Office of the year which you wish to be comp). Once the applications have been reviewed and approved by the Qualifications and Admissions Committee you will be notified and listed in THE CHEMIST, along with the members which were initially nominated and approved as new AIC Members. Attached below is an AIC Membership Application and Professional Directory form for completion. This offer is good from November 1, 1992 through December 31, 1993. Please make copies of this form as necessary for your nominations or contact the AIC National Office for more information.

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I hereby apply for membership in The American Institute of Chemists; I understand that my application will be reviewed by the Qualifications and Admissions Committee; should my membership be denied I will receive a full refund; should it be accepted I agree to abide by the Institute's Code of Ethics, governing documents, and other official policies.

Signature _____ Date _____

**This information is used for statistical purposes only.*

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The American Institute of Chemists, is a professional association, supporting the social, economic and career objectives of the individual scientist. The AIC has now designed a T-shirt to sell to its constituents. A T-shirt was designed particularly with the AIC in mind, so that all have a silent voice in promotion of and assume a professional identity for support of the organization which represent chemists; to wear with pride. The T-shirt is 100% prewashed cotton, with the logo of the AIC and its new motto "The AIC emphasizes The *Chemist in Chemistry*." The AIC T-shirt would be a great gift for friends, colleagues, family and/or ideal for students in the chemical sciences.

AIC is offering its new T-shirt to members @ \$7.50 medium and large and to non-members @ \$10.00 and X-large to members @ \$8.50 and to non-members @ \$11.50. If you are interested in purchasing a T-shirt, please complete and mail this form to: **The AIC T-Shirt, 7315 Wisconsin Avenue, Suite 502E, Bethesda, MD 20814-3209** or call 301-652-2447 now while supplies last.

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Jennifer Lynn Horney
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Continued from page 4

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*** Associate

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The American Institute of Chemists, Inc. offers a broad array of direct member services. As you know, The Institute provides to each member *THE CHEMIST*, its newsletter published 11 times a year and the Professional Directory (\$5. Directory Assessment and \$55. to all others) a comprehensive listing of membership published annually. Aside from these, there are a host of other benefits included which may enhance your professional, personal, and social growth. Some are absolutely free and others you may acquire at lower costs through AIC than elsewhere. Listed below are other direct member services offered by AIC. Check (✓) as appropriate.

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- Apply for the National Certification Program at a reduced fee
- On Line Career Fair: a free computerized employment service
- Term Life Insurance Plan up to \$300,000
- High-Limit Accident Insurance Plan: Accidental death and dismemberment insured up to \$500,000
- Disability Income Insurance Plan monthly benefits to \$1,600
- International Travel Medical Insurance to \$100,000
- Hertz Rental Car discount program
- *AIC Credit Card Program at no cost for the first year
- High-Yield Investment Program: Money Market and Certificate of Deposit

*There is a specific AIC credit card program available for Student Associates.

If you would like to receive information on any of the services listed please contact: AIC, 7315 Wisconsin Avenue, Bethesda, MD 20814-3209.



The American Institute of Chemists, Inc.

Emphasizes *The Chemist In Chemistry*