

# THE NUCLEUS

October 1996

Of the Northeastern Section of the American Chemical Society

Vol. LXXV, No. 2



## Monthly Meeting

*Hill Award, 50-year members  
J. Thackeray on Photoresists*

## Scientists' Ethics?

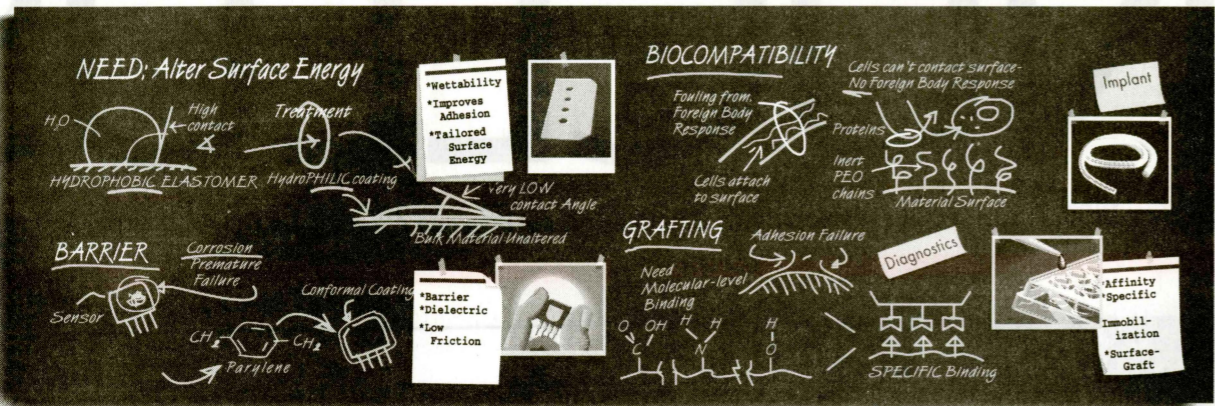
*and the Chemist's Code of Conduct*

## Employment Trends

*and NESACS Employment Services*

## Water Relief Network

*Cooperation of the Chlorine Industry  
and the Red Cross*



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<i>(Photo: Regis College)</i>	
<b>Deadlines: December issue: October 21, 1996</b>	
<b>January issue: November 15, 1996</b>	

# THE NUCLEUS

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# Our 1996 Henry A. Hill Awardee

Alfred Viola

A native of Vienna, Austria, Alfred Viola received a B.A. degree from Johns Hopkins University in 1949 and a Ph.D. in chemistry from the University of Maryland in 1955. After post-doctoral work (organic chemistry) at Boston University he was appointed as Assistant Professor in Chemistry at Northeastern University in 1957. In 1968 he became Professor of Chemistry at Northeastern, his current position.

He has been a visiting professor at the University of Munich, Germany (1977), Monash University, Australia (1984), and has been a Visiting Scholar of Wellesley College since 1982.

He has been active in the Northeastern Section, serving on the Board of Directors for more than 30 years, representing the Section on the Council of the American Chemical Society as Alternate Councilor (1963-68, 1990-91 and 1992-97) and as Councilor (1986-88). In these capacities he has attended most of the national ACS meetings. He served on this Section's Norris Award Committee in 1979-86



Alfred Viola

## The Henry A. Hill Award

*For distinguished service to  
the Northeastern Section*

The Henry A. Hill Award was established in 1980 to honor the memory of Henry A. Hill, long-time member of the Northeastern Section, its Chairman, and a Director of the American Chemical Society and later its President. He died unexpectedly in 1979. ◇

and was its chairman in 1981 and 1985. His greatest contribution to the Section has been his service as chairman of the Continuing Education Committee from 1989 to the present. He has organized two or more contin-

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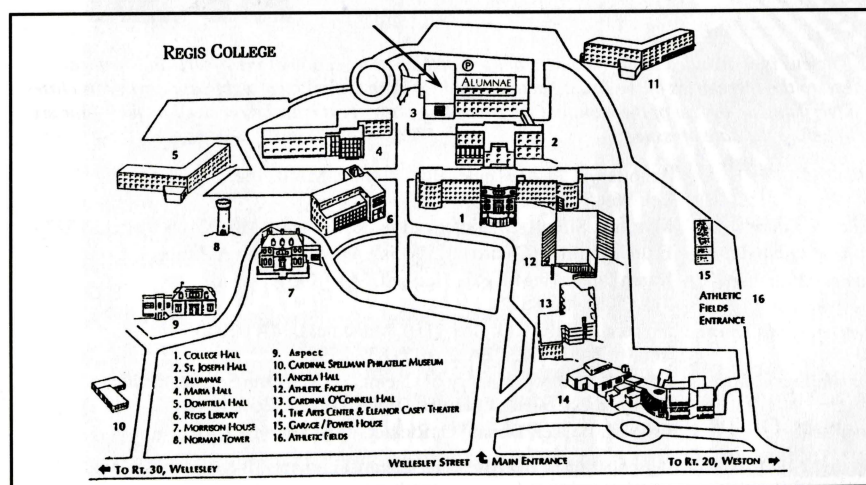
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### Directions to Regis College

**From the North:** Take Rte. 128 to Exit 26, Take Rte. 20 West (right turn where Rte. 20 West and East divide). After 1¼ Mile take School St. south. It becomes Wellesley St. After 1¼ Mi, the Regis College entrance is on your right. Follow signs for parking and the Student Lounge at Alumnae Hall (3).

**From the South:** Take Rte. 128 north to Exit 24 ("I90 and Rte. 30"). Stay straight where the access to Rte. I90 diverges right. Take the following right branch to Rte. 30 West. (\*) After 2 Mi. take Wellesley St. north, ½ Mi. to the Regis College entrance on your left. Follow signs for parking and the student lounge.

**From Boston, Newton:** take the Mass Turnpike Ext. to the Rte. 128/Rte. 30 Exit. Follow the cloverleaf toward Rte. 128 North, but stay right to take the exit to Rte. 30, then left turn to Rte. 30 West. Follow directions above for approach from the south following (\*). ◇



## Monthly Meeting

*The 782nd Meeting of the Northeastern  
Section of the American Chemical Society*

The Henry A. Hill Award  
Honoring 50-year Members

Thursday, October 10, 1996

Regis College, 235 Wellesley St., Weston, MA  
Upper Student Lounge, Alumnae Hall

**5:00-6:15** Information table staffed by the Committee for Employment Services. Consultation available for both employers and those seeking employment: Resume preparation, job searching techniques. ACS literature and videos available. See p. 6

**5:30** Social Hour

**6:30** Dinner

**7:45** Evening Meeting, Patricia L. Samuel, Chairman, presiding  
Presentation of the Henry A. Hill Award to Alfred Viola  
*Henry A. Hill* – Esther A.H. Hopkins  
Introduction of the Award Recipient – Michael J. Hearn  
Presentation of the Award – Patricia L. Samuel  
Presentation of certificates to 50-year members  
Lecture: Dr. James Thackeray, *Shipley Company*: Acid Catalyzed Photoresists Developed for the Manufacture of Computer ICs

Refreshments will be served after the program

Dinner reservations should be made no later than noon, October 3. Please call or fax Marilou Cashman at (800) 872-2054. Reservations not cancelled at least 24 hours in advance must be paid. Members, \$25.00; Non-members, \$28.00; Retirees, \$15.00; Students, \$ 8.00. **THE PUBLIC IS INVITED.** Anyone who needs special services or transportation, please call Marilou Cashman a few days in advance so that suitable arrangements can be made.

Free Parking on campus

*Next meeting on November 14, 1996 at Merrimack College, North Andover, Mass., Murray Lounge, Gildea Hall. The James Flack Norris Award to be presented to Mary Virginia Orna, College of New Rochelle.*  
5:30 Social hour and dinner, 8:00 evening meeting.

## Biography

Dr. Thackeray has a B.S. in Chemistry with honors from Union College, in Schenectady, NY. After Union, he worked at the General Electric Research and Development Center in the area of organic and polymer synthesis for two years. He then went to Cambridge, MA and to work under Prof.

Mark S. Wrighton at M.I.T. He worked extensively on organic conducting microelectronic devices, and in the area of inorganic photoelectrochemistry. After obtaining the Ph.D. in 1985, he accepted a scientific position at Shipley Co., then in Newton Lower Falls, MA. He still works at Shipley, now located in Marlborough, MA, as a principal scientist. Dr. Thackeray's research has been focused in the area of DUV chemically amplified photoresists, which are

## Abstract

The development of photoresists requires a diverse technological convergence of chemistry, physics and engineering. From a chemical standpoint, synthesis of unique high performance, thermally stable polymers is required. Also, photoactive materials are necessary that generate strong acid at the wavelength of interest. These materials are combined in formulations that coat as Newtonian liquids, and that, when the film is exposed, a huge solubility differential between exposed and unexposed resist is created. Current high resolution resists are capable of sub-200 nm resolution at an exposing wavelength of 248 nm. In order to resolve below the wavelength of exposure, extremely high selectivity is required and diffusion of acid must be restricted. The delineation of fine patterns at 200 nm size in 800 nm resist requires excellent exposure equipment (called steppers or scanners), state-of-the-art process equipment (resist thickness controlled to  $\leq 20 \text{ \AA}$ , 3s), and high speed, high resolution resist materials. We have developed high speed, high resolution positive- and negative-tone resist materials based on the chemical amplification concept. These resists are acid catalyzed for high speed, and they possess high resolution, as well. Finally, since the patterned photoresist is not included in a typical device, it must withstand aggressive etch chemistries in order to pattern transfer into the device substrate layer. Although not included in the actual

*continued on page 6*

used by leading semiconductor manufacturers such as IBM, Intel, and also Far Eastern electronic conglomerates. Dr. Thackeray's primary goal has been to make useful new products that are capable of sub-250 nm linewidths. His work has led to a succession of new materials which are now in production at Shipley Co. Dr. Thackeray has generated many leading publications in his field and has 15 U.S. Patents issued, with many more pending. ◇

## 1996 Fifty-Year Members

### Northeastern Section

The following members of the American Chemical Society have been members for 50 years. They will be honored at the October 10, 1996 meeting at Regis College, Weston, MA

Dr. Mary O. Amdur  
 Mr. R. Stuart Armstrong  
 Mr. Joseph D. Averbach  
 Dr. Henry Brown  
 Dr. John F. Codrington  
 Mr. Jerome T. Coe  
 Dr. Robert C. Countryman  
 Dr. Charles F. Davis, Jr.  
 Dr. Marshall E. Deutsch  
 Mrs. Anna A. Ferguson  
 Dr. Edwin F. Fricke  
 Dr. Orrie M. Friedman  
 Dr. Gershon M. Goldberg  
 Dr. Samuel A. Goldblith  
 Dr. David M. Howell  
 Mr. Harold E. Killam  
 Dr. Yutaka Kobayashi  
 Mr. Herbert R. Levine  
 Mrs. Joan R. Moor  
 Mr. Ashley D. Nevers  
 Dr. Charles O. Parker  
 Mr. Peter L. Paull  
 Mr. Kenneth E. Perry  
 Ms. Grace L. Priest  
 Dr. Arthur D. Quackenbush, Jr.  
 Dr. Leon E. Rubin  
 Dr. James J. Ryan  
 Dr. Carlos M. Samour  
 Dr. Myron S. Simon  
 Dr. James F. Somers  
 Mr. Clarence D. Turner  
 Dr. Harry Wechsler  
 Mr. Angus F. Wilson  
 Dr. Richard W. Young ◇

## Abstract

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device, the photoresist material is used up to 40 times for patterning and pattern transfer in order to build today's most advanced DRAMs and microprocessors. Once again, chemistry is at the center of one of America's most critical businesses, the semiconductor industry.

## Employment Services

The Northeastern Section Employment Services Committee has the following aids to both Employers and Applicants:

### A. Videos

Career Transitions  
 Formulas for Success: Turning Job Leads into Gold  
 Developing the Right Picture: Résumé Preparation

*These videos are available on loan for a one-week period*

### B. Brochures

1996 Directory of Experience Opportunities: (For the new chemist)  
 Employment Outlook (Reprint from *C&E News*, Oct. 23, 1995)  
 Targeting the Job Market  
 Resources for Career Management (Resources for conducting a chemistry related job search)  
 Current Trends in Chemical Technology, Business and Employment  
 The Interview Handbook  
 Tips on Résumé Preparation

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### C. Listings

Employer Mailing Lists – A list of employers in the USA, by states, who have used ACS employment services  
 The list of positions available from the National Meeting in Orlando, Fla., including several from New England  
 A list of employers registered at the National Meeting in Orlando

*The above may be consulted at the home of Truman and Arlene Light. Information about all of the above may be obtained by calling Truman or Arlene Light at 617-862-3048 or by e-mail: tslight@aol.com. ◇*

## Nominations

### Gustavus John Esselen Award

The Esselen Award for Chemistry in the Public Interest is one of the most prestigious honors provided by the Northeastern Section of the American Chemical Society. The award annually recognizes a chemist whose scientific and technical work has contributed to the public well-being and has thereby communicated positive values of the chemical profession. The significance of this work should have become apparent within five years preceding nomination and the Awardee shall be a living resident of the United States or Canada at the time of nomination.

There is no limitation to the field within chemistry: Thus, past awardees have worked in environmental chemistry, radiochemistry, steroid chemistry, ecological chemistry, biochemistry and medicinal chemistry.

The Award, consisting of a bronze medal and a sum of \$5,000. Travel expenses incidental to the conferring of this award will be reimbursed. The award is normally given in Cambridge, Massachusetts at the April meeting of the Northeastern Section. The Awardee will deliver an address on the subject of the work for which the honor is being conferred, or for work in progress which is also directed to chemistry in the public interest.

**To Nominate** a candidate please provide the names of two co-sponsors as well as a biography of the candidate, a description of the work which has been recognized as communicating the positive values of the chemistry profession, and copies of pertinent articles. Popular news and feature articles should be included as an indication of the public interest.

**The Nomination deadline is November 1, 1996.** Nominations and inquiries should be directed to Dr. Myron S. Simon, 20 Somerset Rd., West Newton, MA 02165. Joint nominations are acceptable. The award recipient will be notified by February 1, 1997. ◇

## Symposium

### 2nd Annual Pediatric-Chemotherapy Drug Development Symposium

Thursday, November 21, 1996  
 At the Dana-Farber Cancer Institute

Speakers: Peter Houghton, *St. Jude Children's Research Hospital*: "A New Paradigm for Developing Agents for Treatment of Childhood Solid Tumors."; Steven Weitman, *Univ. of Texas Health Science Center, San Antonio*: "New Approaches to Anti-cancer Drug Development for Children with Cancer."; Ken Bair, *Sandoz Pharmaceuticals*: "New Paradigms of Cancer Treatment Targeting Specific Cancer Molecules."

This Symposium is sponsored jointly by the Andrew H. Weinberg Memorial Fund, the Northeastern Section, and its Medicinal Group. Program details and abstracts will be in the November issue. ◇

## Conference

### Ninth international conference on High Temperature Materials Chemistry

Penn State Conference Center  
 May 19-23, 1997

Papers are invited on understanding and predicting the chemistry of processing, fabrication, behavior and properties of high temperature gaseous and condensed materials.

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**For registration:** (800) 778-8632 or: <http://www.cde.psu.edu/C&I/HTMC-IX/> ◇

## Employment Trends in Chemistry

Condensed from a bulletin by Dave Montgomery, Department of Career Services, ACS

Data for this article were obtained from two surveys, conducted by the ACS each year: The Starting Salary Survey (SSS) which goes to chemists and chemical engineers who have received their degrees within the previous year, and the Comprehensive Salary and Employment Status Survey (CSESS) which is conducted annually on a sample of ACS members at or below age 70 and who have neither student-, emeritus- or retired membership status, but is conducted for the entire membership every 5 years.

Years Since Highest Degree	Chemical Engineering		Chemistry	
	Bachelors	Ph.D.	Bachelors	Ph.D.
0-1	0.0%	6.5%	8.7%	6.6%
2-4	4.4%	1.6%	2.5%	2.2%
5 or more	2.9%	2.5%	2.6%	2.1%
All years	3.0%	2.5%	2.9%	2.3%

(excluding those not seeking employment)

Consistent with these decreases, other employment categories, such as part-time employment and postdoc/fellowships showed an increase. Also, in 1995 2.6% of unemployed chemists were not seeking employment, increasing from 2.0% in 1994. For chemical engineers these figures were 2.5% in 1994, 3.2% in 1995. Thus, this

improvement in unemployment rate was accompanied by shifts from full-time jobs to alternative categories, including not participating in the market. Figure 1 shows the unemployment rates graphically for 1971-1995. Similarly, Figure 2 shows the percentage of new Ph.D. graduates taking postdoctoral positions for 1975-1995.

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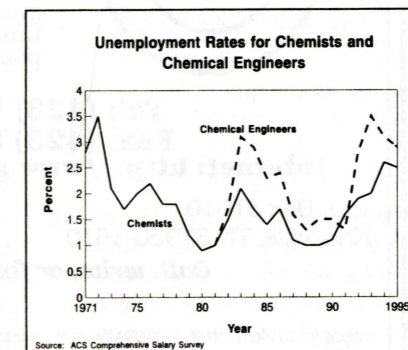


Figure 1

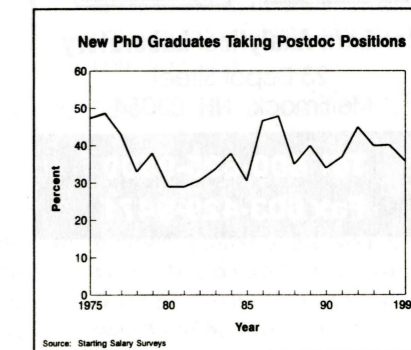


Figure 2

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Years Since Highest Degree	Chemical Engineering		Chemistry	
	Bachelors	Ph.D.	Bachelors	Ph.D.
0-1	0.0%	6.5%	8.7%	6.6%
2-4	4.4%	1.6%	2.5%	2.2%
5 or more	2.9%	2.5%	2.6%	2.1%
All years	3.0%	2.5%	2.9%	2.3%

(excluding those not seeking employment)

Consistent with these decreases, other employment categories, such as part-time employment and postdoc/fellowships showed an increase. Also, in 1995 2.6% of unemployed chemists were not seeking employment, increasing from 2.0% in 1994. For chemical engineers these figures were 2.5% in 1994, 3.2% in 1995. Thus, this

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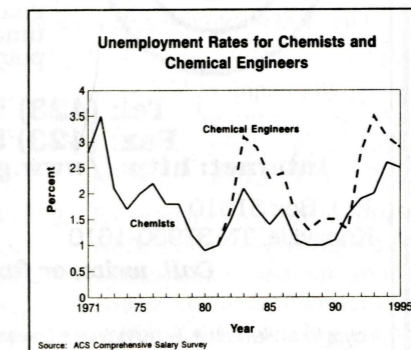


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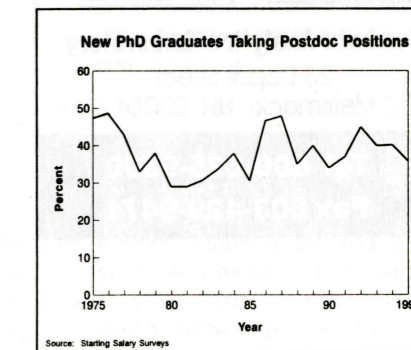


Figure 2

## TRACE ELEMENT ANALYSIS

### 3-5 DAY TURNAROUND

- High Purity Metals & Alloys
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- Glasses
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## Empoyment Trends

continued from page 7

### Starting Salaries

Except for slight dips in 1993 and 1994, starting salaries at all levels showed a slow, but steady increase. Thus in 1975, chemists' starting salaries were (in thousands) 10 (B.S.), 11 (M.S.), 17 (Ph.D.), and for 1995 the corresponding figures were 25, 36, and 50. For chemical engineers the increases for the same period were from 14 to 38 (bachelor's), 15 to 43 (master's), 20-57 (Ph.D.'s).

From the 1995 CSESS of the whole membership it is apparent that the median salary for all chemists decreased when adjusted for inflation in all categories. These decreases, compared to 1994, were 1.3%, 1% and 1.4% for BS, MS and PhD, respectively. The resulting median salaries for the three categories as of March 1995 were \$45,300, \$53,500 and \$66,000, respectively. Chemical engineers fared somewhat better: Those with master's degrees had a median salary of

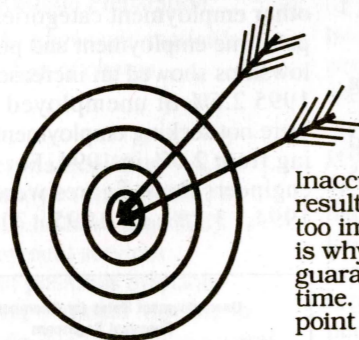
\$66,600, the 1994-1995 increase exceeding inflation by 5.4%. However, those with doctorates experienced a decrease in median salary to \$74,500. Adjusted for inflation, this was a 4.2% decrease. For bachelor's chemical engineers, the decrease was 3.8%.

Salaries of ACS members who worked in academia kept pace or exceeded the inflation rate. There was a wide divergence, depending on rank, the school type and the function of the member. The largest increases were at the associate professor level.

The Committee on Science, Engineering, and Public Policy of the National Academy of Science has addressed the issues of supply and demand for doctoral graduates in science and engineering. Doctoral degrees have doubled since 1973, and, while the US economy has absorbed them so far, the future is uncertain. Increasing numbers of Ph.D.s are taking jobs outside of academe, i.e. in applied R&D and non-research employment. Also, there is an increas-

continued on page 13

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## THE CHEMIST'S CODE OF CONDUCT

*The American Chemical Society expects its members to adhere to the highest ethical standards. Indeed, the federal Charter of the Society (1937) explicitly lists among its objectives "the improvement of the qualifications and usefulness of chemists through high standards of professional ethics, education, and attainments..."*

*Chemists have professional obligations to the public, to colleagues, and to science. One expression of these obligations is embodied in "The Chemist's Creed," approved by the ACS Council in 1965. The principles of conduct enumerated below are intended to replace "The Chemist's Creed." They were prepared by the Council Committee on Professional Relations, approved by the Council (March 16, 1994), and adopted by the Board of Directors (June 3, 1994) for the guidance of Society members in various professional dealings, especially those involving conflicts of interest.*

### CHEMISTS ACKNOWLEDGE RESPONSIBILITIES TO:

#### THE PUBLIC

Chemists have a professional responsibility to serve the public interest and welfare and to further knowledge of science. Chemists should actively be concerned with the health and welfare of co-workers, consumers, and the community. Public comments on scientific matters should be made with care and precision, without unsubstantiated, exaggerated, or premature statements.

#### THE SCIENCE OF CHEMISTRY

Chemists should seek to advance chemical science, understand the limitations of their knowledge, and respect the truth. Chemists should ensure that their scientific contributions, and those of their collaborators, are thorough, accurate, and unbiased in design, implementation, and presentation.

#### THE PROFESSION

Chemists should remain current with developments in their field, share ideas and information, keep accurate and complete laboratory records, maintain integrity in all conduct and publications, and give due credit to the contributions of others. Conflicts of interest and scientific misconduct, such as fabrication, falsification, and plagiarism, are incompatible with this Code.

#### THE EMPLOYER

Chemists should promote and protect the legitimate interests of their employers, perform work honestly and competently, fulfill obligations, and safeguard proprietary information.

#### EMPLOYEES

Chemists, as employers, should treat subordinates with respect for their professionalism and concern for their well-being, and provide them with a safe, congenial working environment, fair compensation, and proper acknowledgment of their scientific contributions.

#### STUDENTS

Chemists should regard the tutelage of students as a trust conferred by society for the promotion of the student's learning and professional development. Each student should be treated respectfully and without exploitation.

#### ASSOCIATES

Chemists should treat associates with respect, regardless of the level of their formal education, encourage them, learn with them, share ideas honestly, and give credit for their contributions.

#### CLIENTS

Chemists should serve clients faithfully and incorruptibly, respect confidentiality, advise honestly, and charge fairly.

#### THE ENVIRONMENT

Chemists should understand and anticipate the environmental consequences of their work. Chemists have responsibility to avoid pollution and to protect the environment.

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## Scientists' Ethics? Nothing New

by M.S. Simon

The problem of carrying out a scientific career in an ethical manner has again become a major issue, leading to seminars, sessions at national meetings, and articles in the daily newspapers, all of which leads one to suppose that all was ever sweetness and light before our time. Not so. Human beings have always been prone to shortcuts and waywardness, and the scientific community has never been immune.

In the interest of stimulating discussion and providing some historic background, we republish a "Code for Ethics for Scientific Men" which appeared in the October, 1927 issue of the *NUCLEUS*. The code was prepared by the Committee on Social and Eco-

nomics Welfare of Scientific Men of the American Association for the Advancement of Science, and was adopted unanimously at its meeting in Santa Fe on April 13, 1927. Presumably, the code with minor modifications, was considered suitable for scientific women, but our source is mute on that point.

1. Assume an obligation to do honest work and to impartially present the same to the public, regardless of political, economic or religious prejudice, pressure or tradition.
2. Exemplify in your conduct and work a courageous regard for the whole people, and not alone some powerful and influential fraction thereof, with which you come in close personal contact.

3. Recognize and assume a dual obligation (a) to do the best possible work in your field, (b) to promote the social and economic welfare of your colleagues and yourself.
4. Promote the dignity of your profession; avoid malicious criticism of colleagues; cultivate a professional consciousness.
5. Support laws to insure competency and high standards on the part of the scientific - technical men in every field.
6. Respect yourself and your profession; do not underbid your colleagues; insist that the laborer is worthy of his hire.

continued on page 10

## Scientists' Ethics

continued from page 9

7. Be slow to change jobs and institutions where such change means a loss of project efficiency, but do not hesitate to change where the attitude of autocratic superiors, miserably inadequate pay or other conditions conducing to inexcusable inefficiency menace the entire service you are endeavoring to perform.
8. Investigate before accepting a new position; do not become a candidate for any position from which the previous incumbent was unfairly or wrongly dismissed, or a position in any institution under the ban of dignified organizations of scientific men.
9. Insist on such a measure of reasonable participation in the determination of policies in your institution as will best promote effective scientific work.
10. Do not publish the work of colleagues or subordinates without

giving full credit where credit is due; authorship should be determined on the basis of the responsibility for the ideas involved, conception and organization of the project, actual field or research work, and actual compilation and writing of the results.

11. Avoid, alike, hasty and superficial publication, and the holding of real results indefinitely without publication.
12. Take the public into your confidence; in the end the public pays the bills and has the right to know what is going on.
13. Interest yourself in human concerns outside your specialty... politics, religion, economics... your obligation to serve the community along these lines is directly proportional to your training and real ability.

*The ACS Committee on Professional Relations has struggled with this issue over many years, resulting in the 1994 "The Chemist's Code of Conduct" which is reprinted above. ◇*

## Henry A. Hill Awardee

continued from page 4

uing education events each year, such as workshops, symposia and short courses. The ACS has used some of these short courses as pilot-runs before offering them to the ACS membership at large.

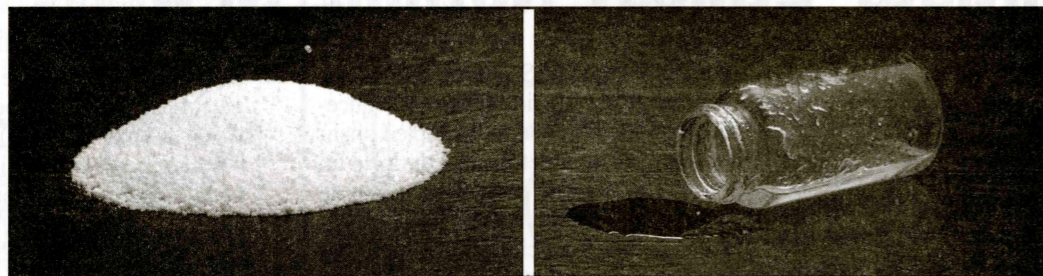
These events have been well-attended, have helped chemists in the Section to hone their skills or acquire new skills, especially appreciated by unemployed members who have attended at greatly reduced fees or at no fee.

Not only have these workshops and short courses helped members of the Section, but they have done so without any cost to the Section, indeed, they have provided income to the Section.

Dr. Viola and his wife Joy live in Wayland with their two golden retrievers. They are active in Yankee Golden Retriever Rescue and have travelled to seven continents in pursuit of nature photography and as members of the American Birding Association. ◇

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## Historical Column

by Edward R. Atkinson, Amherst, Mass.

*Continuation of the short biographies of chemists and chemical engineers whose deaths have been reported to us during the past 12 months. As promised last month, here is the poem authored by C. Norman Collard, whose biography appeared in the September issue:*

### The Reluctant Tower

In Lake Charles, LA, many years ago  
It was hotter than hell, we never saw snow  
Snakes and alligators plentiful too  
There were enough around to stock a zoo  
We were working there at Conoco, and starting  
up the plant  
But the benzene tower was telling us we can't.  
It burped, and it gurgled, and  
there was nothing we could do,  
it wouldn't make benzene, and Conoco could sue.  
We called in to Boston, and  
asked for their advice  
They said "we'll send a man  
who will fix it in a trice".  
So they sent down Johnny C.,  
who didn't want to roam  
He loved his "darlin" Irma, he'd rather be at home.  
Johnny flew down astride his white horse,  
he was in a hurry, you could see, of course.  
He arrived on Saturday and when he looked,  
he turned and said "your goose is cooked".  
"It'll never work, the problem is foam".  
And Sunday he mounted his horse and headed home.  
We were holding the bag, or so it seemed,  
it was worse than we had ever dreamed.  
On Monday morning, sure we were cursed  
we shut down the tower, fearing the worst.  
We opened the tower and looked inside  
What we saw could come in with the tide  
The caps were covered with goo and crud,  
like shell fish happily living in mud.  
We cleaned the top plate,  
the others were fine  
We closed the tower, put it on line.  
Our problem was solved, it worked like a charm,  
we breathed a sigh of relief, no need for alarm.  
That day I learned a lesson to remember, be January,  
March, July, or December  
Be sure you have all the facts at hand,  
before you decide to take the stand.  
Or you might say "it won't work",  
and close your case, and end up  
with egg on your face.

C. Norman Collard  
December 1990.

**H. Webster Day**, 79, died on July 13, 1996. He was a Marblehead native and obtained the B.S. in chemical engineering from Tufts University in 1939. During the years of World War II he was employed by the B.F. Goodrich Co. in Pennsylvania developing uses for the newer synthetic rubbers. In 1945 he joined duPont and worked in the rubber industry until retirement in 1982. He was at one time a member of the ACS Council representing the Rubber Division.

In 1950 Mr. Day moved to Hingham, Mass., and during 39 years he served there in several community activities, including the school committee, youth baseball, and the Boy Scouts. During his last years he was a resident of Brookhaven at Lexington. A memorial service was held August 10 at the First Parish Church in Concord.

**Theodore Kapala**, 87, died on September 28, 1995. He was a native of Lowell, Mass. and a graduate of the Lowell Textile Institute. In 1934 he began a 39-year career as a chemist in the service of U.S. government agencies, first at the War Department depot in Philadelphia, and later with the Army's Quartermaster Corps in Washington and Natick, Mass. He received awards and recommendations for his work developing compounds to protect military personnel from nuclear radiation. During the years at the Natick laboratories he was a resident of Wellesley, Mass.

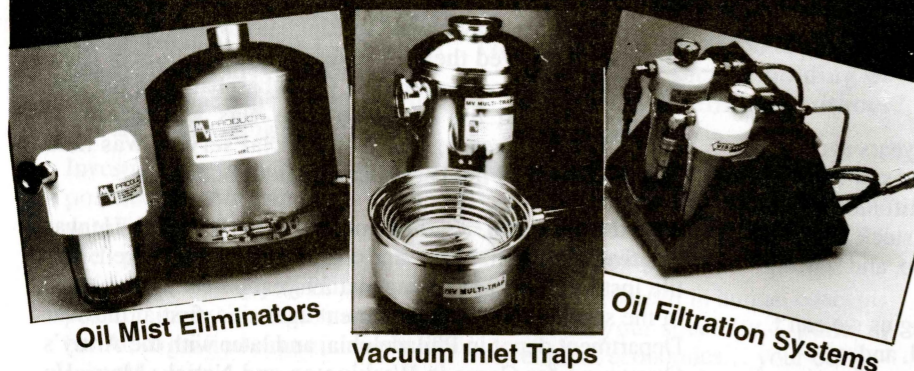
**Warren Craig Lothrop**, 84, died on June 11, 1996 after a year of gradually decreasing physical health. He was a native of Brookline, Mass.; his father, Theodore A. Lothrop, was executive secretary of the Massachusetts Society for the Prevention of Cruelty to Children. He received the A.B. degree from Harvard in 1933 and the Ph.D. in chemistry in 1937. His graduate research on the Mills-Nixon effect was under the direction of Louis F. Fieser. He then worked for a year at Yale as an assistant to R.J. Anderson who was studying the lipids of the tubercle bacillus in an effort to understand the drug resistance of that organism.

In 1938 Warren came to Trinity College in Hartford as an instructor and remained there until 1942 when he became a technical aide in the Office of Scientific Research and Development in Washington, D.C. During the Trinity years he found, among the instructors at the nearby Miss Porters School, a wife in the person of Margaret S. Lotspeich. It was during this period that he performed his last laboratory work that involved the first synthesis of the hydrocarbon biphenylene. Just a month before his death Warren derived considerable pleasure when diphenylene and the Mills-Nixon effect were cited in connection with the cyclohexatriene problem in *Chemical and Engineering News*.

After the war Lothrop spent one semester on the faculty of Williams College, then joined his OSRD mentor Earl P. Stevenson who had become president of Arthur D. Little, Inc. As vice president of ADL, Lothrop established strong groups in organic chemistry and analytical chemistry. He also introduced the technical audit concept with which ADL teams studied the reorganization of many major corpora-

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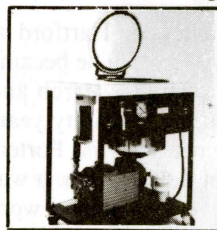
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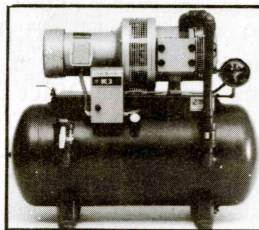
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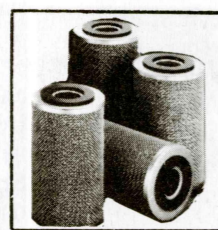
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## Historical Notes

*continued from page 11*

tions in the U.S. He directed a major laboratory study of the relation between the structure and explosive power of organic compounds. With G.R. Handricks he published the results of this study in *Chemical Reviews*, **44**, 419 (1949).

When Stevenson retired from the presidency of Arthur D. Little, Royal Little arranged to have General James Gavin succeed him. After Gavin returned from a term as U.S. ambassador to France in 1963 Lothrop decided to leave ADL. He was offered management positions in several areas and chose to experience life in the Middle West by becoming vice president for corporate development at Armour & Co. in Chicago. When the Greyhound Corporation purchased the chemical business of Armour in 1970 and moved to Phoenix, Arizona, Warren continued as a consultant to management for a short time, then moved to Kennebunk, Maine where he spent the balance of his life. In his retirement he and his wife joined a group of retired executives and toured South America, offering expertise to interested governments and industries. In Kennebunk he was assisted by his lawyer son Mark in founding the Tavistock Corporation whose principal business was the printing and sale of handsome colored postcards showing several Kennebunk scenes. Also offered were all-plastic lobster pots, which made the "Patent of the Week" list in the *New York Times*. Lothrop was the author of several publications in chemistry and industrial management. Awards received during his career included the Presidential Certificate of Merit from Harry S. Truman in 1948. Throughout his professional life he bore the burdens of management with considerable grace. He somehow or other was able to avoid mass layoffs of employees and was very well liked by the men and women who worked under his direction. He and I were valued close personal friends for about 60 years.

*(To be continued)* ◇

## Water Relief Network

*Launched jointly by the American Red Cross and the Chlorine Chemistry Council*

*From a news release by the Chlorine Chemistry Council*

In a ceremony on June 21 the Chlorine Chemistry Council (CCC) donated \$100,000 to the American Red Cross, launching the CCC's **Water Relief Network**. This network will make available the products of chlorine chemistry to global disaster relief efforts.

Over 50 corporations are participating in the Network to provide quick and easy access to products to help restore safe drinking water supplies: disinfecting chemicals, plastic water bottles, PVC pipe.

The CCC is a business council of the Chemical Manufacturing Association (CMA) and is comprised of manufacturers and users of chlorine and chlorine-based products, and other organizations with an interest in chlorine chemistry.

### Disasters Impact the Safety of Drinking Water

Natural or human-made disasters often cause damage to drinking water supplies and its delivery infrastructure, leaving large numbers of people without water or at risk from life-threatening illnesses due to inadequate water disinfection.

From the floods of 1993 to the Northridge earthquake in 1994 and countless scenarios abroad, history has shown that unsafe drinking water is only a disaster away.

### Chlorine Products are Part of the Solution

Emergency management personnel frequently rely upon the products of chlorine chemistry to restore safe drinking water: Water disinfection chemicals, plastic water containers, PVC pipe.

Last year thousands of pounds of calcium hypochlorite were sent to Rwanda to disinfect water and curb the spread of cholera that was ravaging large refugee camps. After the flood-

ing that followed several hurricanes along the Gulf of Mexico, chlorine bleach helped disinfect houses to make them fit for human habitation.

When drinking water distribution pipes are damaged in earthquakes, PVC piping of PVC-based flexible hose is used to set up temporary distribution systems. One and five gallon water containers help residents to take water home from centralized water distribution sites.

### The Chlorine Industry Water Relief Network: Donating Support through the Red Cross

The chlorine industry is committed to providing properly disinfected drinking water. The Water Relief Network has been established to help ensure that the disaster relief community has ready access to the products necessary to restore safe water in times of need. Working with the Red Cross, the network donates products necessary for global relief efforts.

For more information on the Network, call (703) 741-5829. ◇

## Employment Trends

*continued from page 8*

ing delay in finding employment, and a trend toward underemployment. Quoting from the report of that committee: Trends which imply lower demand "including cuts in defense spending, industrial restructuring, and reductions in growth of federal R&D spending" are unlikely to reverse soon. Yet, the committee was unwilling to call for reductions in Ph.D. production since it thought that the current imbalance may be self-correcting, in the long run.

### Conclusion (quoted in full)

The chemistry job market as measured by unemployment rates, salaries, and

proportions of graduates in postdoctoral positions was very poor in 1994. However, there are signs of slow improvement in 1995. Long-term growth in chemistry and chemical engineering is projected to be significant though weaker than the national aggregate. Job candidates can help their chances in the market by developing abilities in addition to a mastery of chemistry."

*For further information or for obtaining copies of the full report, contact:*

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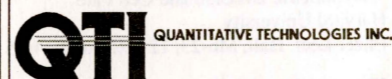
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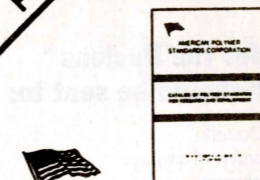
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# Calendar

## September 25

Dr. John Wood (Dept. of Chemistry, Yale Univ.)  
"Progress in the Synthesis of  
Indolocarbazole Natural Products"  
UMass Dartmouth  
Science & Eng. Building, Room 305, 4:00 pm

## September 26

Prof. Amos B. Smith (Univ. of Pennsylvania)  
"Recent Advances in the Total Synthesis of  
Architecturally Complex Natural Products"  
Boston College  
Room 127, Merkert Chemistry Center, 4:00 pm

Prof. Joseph Goldstein  
(Univ. of Texas, Southwestern Medical Center)  
"Regulation of Cholesterol by SREBP, a  
Membrane-Bound Sterol Sensor and  
Transcriptional Activator"  
**1996 MAX TISHLER LECTURE**, Harvard Univ.  
Science Center D, 1 Oxford Street, 4:00 pm

## September 27

Prof. Joseph Goldstein  
(Univ. of Texas, Southwestern Medical Center)  
"Prenylated Proteins: New Targets  
for Biology and Medicine"  
**1996 MAX TISHLER LECTURE**, Harvard Univ.  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 2:00 pm

## September 30

Prof. Frank-Gerrit Klämer  
(Universität GH Essen, Germany)  
"Organic Reactions at High Pressure.  
The Use of Packing Coefficients in  
Theory of Pressure Effects"  
Harvard University  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 4:15 pm

## October 2

Dr. Thomas Pochapsky  
(Dept. of Chemistry, Brandeis Univ.)  
"Can We Watch Proteins at Work?"  
UMass Dartmouth  
Science & Eng. Building, Room 305, 4:00 pm

## October 3

Prof. Wilma K. Olson (Rutgers Univ.)  
"Effects of the Local Chemical Structure on the  
Global Properties of Long DNA's"  
Boston College  
Room 127, Merkert Chemistry Center, 4:00 pm

## October 9

Dr. William Orne-Johnson  
(Dept. of Chemistry, Mass Inst. of Technology)  
"A Recurrent Kidney Stone Disease: Chemical  
Basis and Possible Diagnosis Before Onset. The  
Story of a Fatal Flaw in a Protective Mechanism"  
UMass Dartmouth  
Science & Eng. Building, Room 305, 4:00 pm

## October 10

Prof. Warren S. Warren (Princeton Univ.)  
"Generating and Exploiting Intermolecular  
Cross-Peaks in Solution NMR"  
Boston College  
Room 127, Merkert Chemistry Center, 4:00 pm

## October 14

Professor John Griffin (Stanford University)  
"Catalytic and Other New Functions for  
Receptor-like Antibacterial Agents"  
Harvard University  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 4:15 pm

## October 16

Dr. Frank Urban  
(Central Research Div., Pfizer, Inc.)  
"Synthesis of Tetrahydrobenzazepinone  
CCKb Antagonists"  
UMass Dartmouth  
Science & Eng. Building, Room 305, 4:00 pm

## October 16-18

Prof Arthur Kornberg (Stanford Univ.)  
"Biotechnology: Bio or Tech?"  
"The Ten Commandments of  
Replication Enzymology"  
"Inorganic Polyphosphate –  
A Molecular Fossil Come to Life"  
**UNIVERSITY LECTURE SERIES**, Boston Coll.  
Room 127, Merkert Chemistry Center, 4:00 pm

## October 19

Frontiers in Chemical Biology –  
A Symposium in Honor of Irving H. Goldberg  
Speakers include Daniel Nathans, Claude  
Helene, Peter D. Dervan, JoAnne Stubbe, Irving  
H. Goldberg, Anthony Cerami, Daniel Goldberg,  
H. Gobind Khorana, Michael Smith.  
Harvard Medical School, Cannon Room, C1  
further details at <http://ficbio.med.harvard.edu>

## October 23

Dr. Wilfred H. Nelson  
(Dept. of Chemistry, Univ. Rhode Island)  
UMass Dartmouth  
Science & Eng. Building, Room 305, 4:00 pm

## October 24

Prof. Lila M. Gierasch  
(Univ. Massachusetts, Amherst)  
"Protein Folding in the Test Tube and in the Cell"  
Boston College  
Room 127, Merkert Chemistry Center, 4:00 pm

## October 28

Prof. Chi-Huey Wong (Scripps Research Inst.)  
Harvard University  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 4:15 pm

## October 31

Prof. Larry E. Overman (Univ. California, Irvine)  
"New Cyclization Reactions and their  
Application in Natural Products Total Synthesis"  
Boston College  
Room 127, Merkert Chemistry Center, 4:00 pm

## November 4

Prof. Stuart Schreiber (Harvard Univ.)  
Prof. Marc G. Caron (Duke Univ. Med. Center)  
"G. Protein-Coupled Receptors:  
Mechanisms of Signaling Termination"  
Prof. Paul Sigler (Yale University)  
**PFIZER SYMPOSIUM**, Harvard University  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 1:30 pm

## November 11

Prof. Richard Losick (Harvard Univ.)  
"Asymmetric Division and Cell Fate"  
Harvard University  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 4:15 pm

## November 18

Prof. Eric Gouaux (Univ. of Chicago)  
Harvard University  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 4:15 pm

## November 25

Dr. Catherine Dulac (HHMI, Columbia Univ.)  
Harvard University  
Pfizer Lect. Hall, Mb-23, 12 Oxford St., 4:15 pm

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

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