



THE NUCLEUS

Centennial Year

January 1998

Vol. LXXVI, No. 5

Monthly Meeting

W.P. Teagan speaks about Fuel Cell Technology

Historical Note

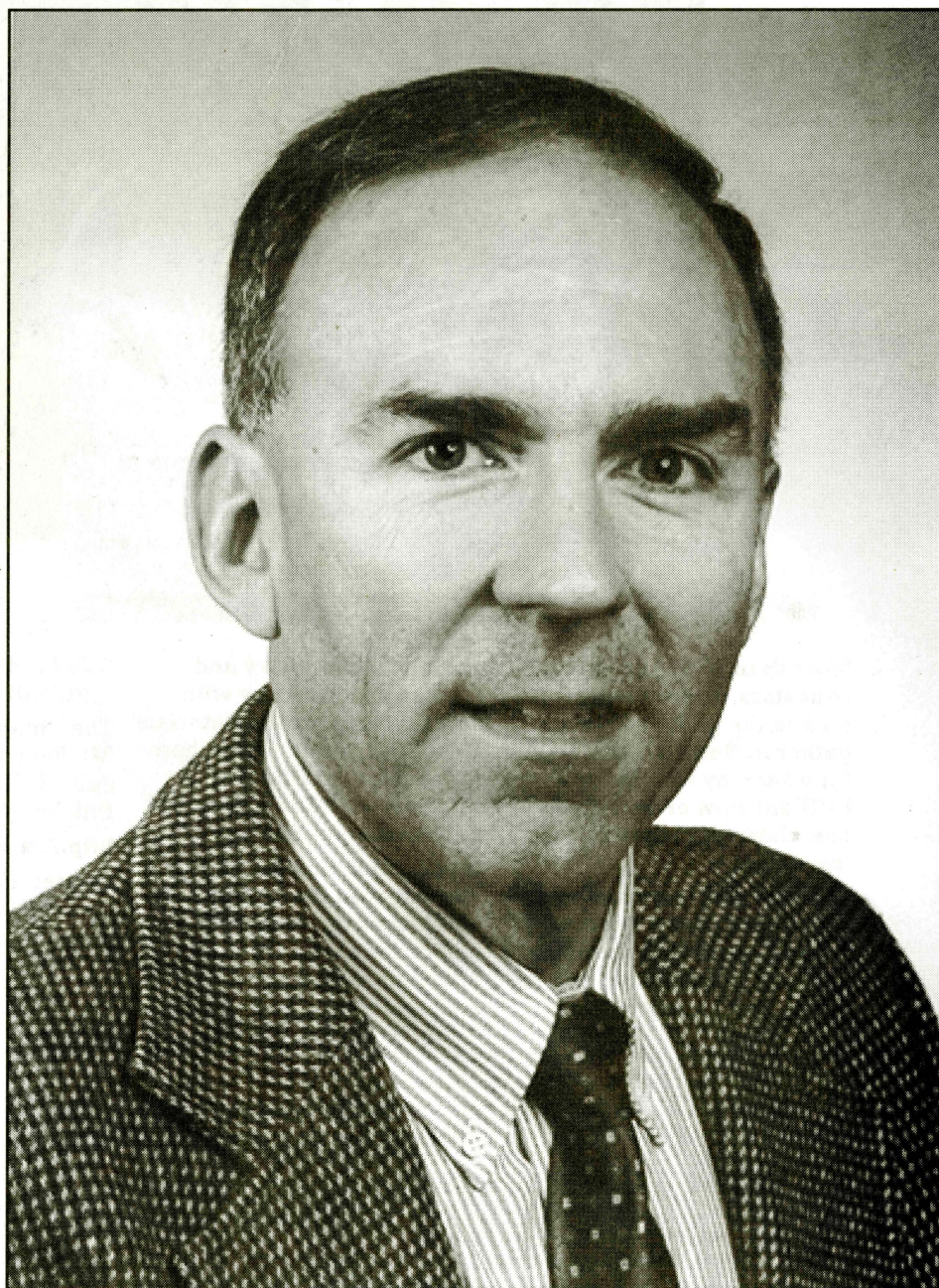
Remembering Paul D. Bartlett

Book Review

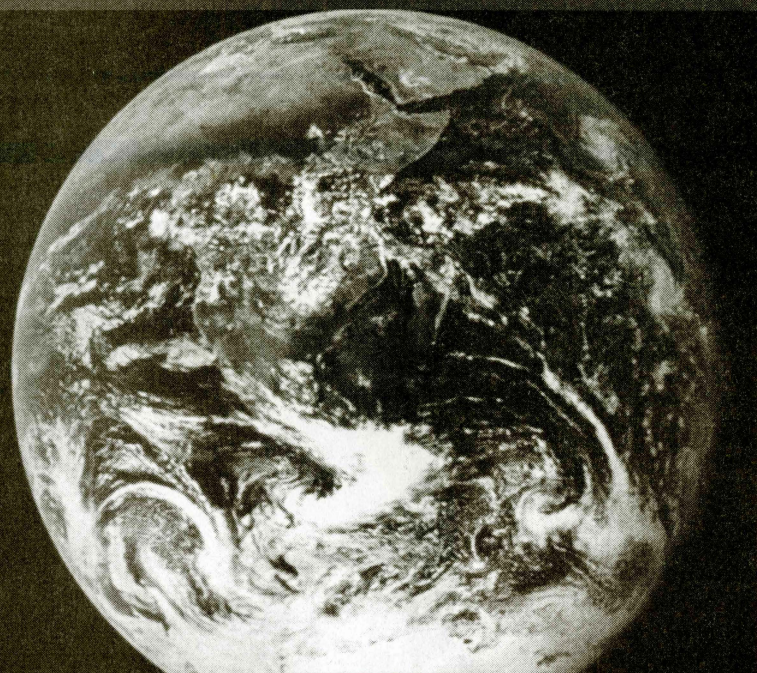
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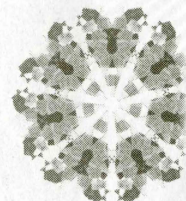
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Cover: Michael J. Hearn, 1998 NESACS Chair (photo by A. Fingland)

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THE NUCLEUS

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From the New Chair

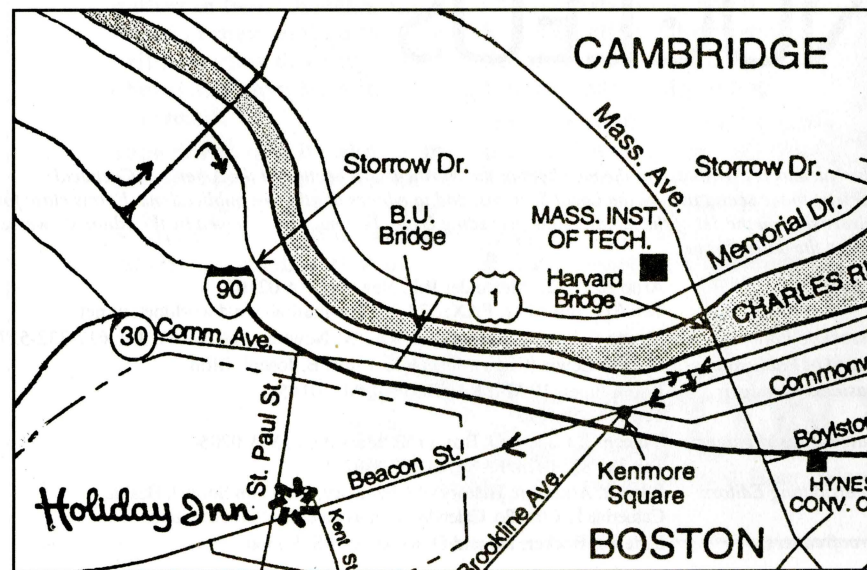
by Michael Hearn

The coming of the New Year is always a time for reflection on the significance of past events and on our hopes for the future. This New Year, however, has even more meaning for those of us within the Northeastern Section because we will be celebrating our Centennial, one hundred years of service to our membership. Our one hundredth birthday as a local section of the American Chemical Society will be a continuing theme throughout the entire year's program. This will be punctuated by a number of major events of interest to our membership; naming only a few, these include a special Centennial observance in the spring, the American Chemical Society National Meeting in Boston in August and National Chemistry Week in November. Readers of the Nucleus

will be invited to join in all these events as they unfold.

Our Centennial represents one hundred years of the Section's service to our chemical community, but we should bear in mind the challenges awaiting us in the future, even as we celebrate the achievements of the past. We must renew our efforts in professional understanding, public awareness and chemical education. The strong traditions of the committees and activities of the Northeastern Section provide effective ways in which to make these efforts; and we could not hope to make progress without the determination and sense of dedication of the hard-working individuals who so generously offer their time, energy and expertise. Many opportunities present themselves for involvement on the part of all our membership as we seek to make our Section a truly welcoming organization to diverse chemistry constituencies. Let me welcome the New, Centennial, Year by extending a warm invitation to all to join in our celebration and in the good work of the Northeastern Section. ◇

The February issue will be a special Centennial issue.



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***From the Kenmore Exit off Storrow Drive:** At the first set of lights turn right onto Beacon Street. In Kenmore Square stay in the center lane and take the center road, which is Beacon St. The Holiday Inn is about 0.6 Mi. on the right at St. Paul St. Enter the driveway into the garage at the in-town end of the building. Parking at meters on Beacon Street may be available, should the garage be full.

By Public Transportation: Take (or change at Park St. to) the Green Line, "C" train. Exit at the St. Paul St. stop (3rd stop after Kenmore) across from the Holiday Inn. ◇

Monthly Meeting

The 794rd Meeting of the Northeastern Section of the American Chemical Society

Holiday Inn, 1200 Beacon St., Brookline, Mass.

Thursday, January 8, 1998

5:30 Social Hour; a table of Career Services Literature and Aids will be available. See page 17.

6:30 Dinner

8:00 Evening Meeting, Dr. Michael J. Hearn, Chair, presiding
W. Peter Teagan, Arthur D. Little, Inc. *The Future of Fuel Cell Technology*"

Dinner reservations should be made no later than noon, January 2. 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 a space available basis in the Holiday Inn Garage; enter from westbound Beacon St. (at the in-town end of the inn). See map on p. 4.

Next meeting, February 12, 1998 at Simmons College, The Fenway, Boston, Mass. Dr. Attila E. Pavlath, Director-at-Large, to speak on the future of the ACS.

Biography

Dr. Teagan received a Ph.D. from M.I.T. in Mechanical Engineering and a B.S. from Brown University in Engineering Sciences. He has written more than two dozen papers dealing with solar energy utilization, advanced heat engine development, and direct energy conversion. His technical development work has resulted in a number of patents.

He is a member of Sigma Xi, Tau Beta Pi, the American Society of Mechanical Engineers, the Solar Energy Society, and the American Society of Heating, Refrigeration, and

Air Conditioning Engineers.

Dr. Teagan is the Managing Director and Vice President of the Energy Technology Section in the Technology Development Group of Arthur D. Little, Inc. He has worked in over a dozen countries with government and industrial organizations in technology portfolio planning/evaluation and on energy sector policy and strategy issues.

Examples of projects for which Dr. Teagan has had primary responsibility include:

- Undertaking technology and market assessments of fuel cell technologies as applied both to stationary and transportation applications. This work included

performance and cost reviews of the major fuel cell technology options based on data collected from sources in the United States, Europe, and Japan. Special emphasis was given to industrial and commercial cogeneration applications due to the rapid growth in these market sectors and the excellent fit of fuel cell technology.

- Defining the cost structure of four major fuel cell development paths (PAFC, MCFC, PEMFC, and SOFC) in order to quantify the production volume/cost relationships and identify potential technical improvements which could significantly lower costs. He has also evaluated the role of fuel cell technology both in light and heavy duty transportation applications. This work has focused on quantifying the benefits of fuel cell technology as measured by reduced emissions, improved fuel economy, and fuel flexibility. The analysis has included modeling of both performance characteristics and costs.

- Evaluating the potential for advanced power cycle technologies and how technology and fuel selection will increasingly be influenced by environmental issues. Technology options considered included advanced gas turbine/combined cycles, fuel cells, coal gasification/combined cycles, and renewables.

- Assessing the impacts of the equipment used in the residential/commercial sector on energy use and the environment in the countries of the European Community. This work focused on the global warming impacts of energy use as measured by CO₂ emissions. Technology strategies were identified for reduced energy use and policy options (energy efficiency standards, incentives, etc.) were identified to accelerate the market introduction of high efficiency, low emission impact and suitable equipment. ◇

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Historical Note

by Edward R. Atkinson, Amherst, Mass.

When **Paul Doughty Bartlett** celebrated his 90th birthday on August 14, 1997 a brief summary of his life and an expression of well wishes from the members of the Northeastern Section were published in the October issue of *The NUCLEUS*. At that time I was considering writing this Historical Note about Paul and had already collected material for it. I planned to go over the material with Paul before submitting it for publication.

As has been noted in the local and national press, Paul Bartlett died on October 11. This note is for the benefit of friends who may not have access to a formal Memorial Minute that will be published later by Paul's colleagues on the Harvard faculty and to a biography to be published in the *Proceedings of the National Academy of Science*.

Paul Bartlett was a native of Ann Arbor, Michigan. After receiving the B.A. degree at Amherst College in 1928 he came to Harvard for the Ph.D., received in 1931 under James B. Conant. He served a fellowship at Rockefeller/Columbia for one year, then was Instructor in Chemistry at the University of Minnesota (1932-34). He joined the Harvard faculty in 1934 as Instructor, became a full Professor in 1946, was named Erving Professor in 1948, and became emeritus in 1975. He was chairman of the chemistry department for the 1951-1954 years. After retirement the Bartletts sought warmer climes and Paul became the Robert A. Welch Research Professor at Texas Christian University where he and his students carried on research until 1985. He then came back to New England. At the time of his death he was a resident of Brookhaven-at-Lexington Life Care Community where he had greeted friends and from which he had been able to attend occasional professional and social meetings in the Boston area.

Paul Bartlett achieved international fame as an authority in the field of physical organic chemistry. Just four years after joining the Harvard faculty he received the American Chemical Society Pure Chemistry Award that honored young chemists. From then on his life was characterized by a long succession of awards, lectureships, and visiting professorships. He became a member of the National Academy of Science and of similar academies in England, France, and Japan. He received the National Medal of Science from President Lyndon Johnson. Honorary degrees were received from Amherst College, and from the Universities of Chicago, Montpellier, Paris, and Munich. He was a senior member of the Ouroboros Club and a brother in Omicron of Alpha Chi Sigma.

Paul Bartlett served the Northeastern Section as chairman in 1953. The Section awarded him the Richards Medal; in 1966 and the James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry in 1978. The ACS awarded him the Norris Award in Physical Organic Chemistry in 1969.

Throughout his career Paul was admired widely as a teacher. His students at Harvard and at Texas Christian University formed an organization known as the Bartlett Group, which met regularly to discuss matters of mutual interest. At

the time of Paul's retirement from Harvard the group presented him with a book (P.D. and the Bartlett Group at Harvard 1934-1974), a collection of letters and technical papers. In a review of the book Cheves Walling remarked, "Bartlett has not only been an outstanding scientist in his own right, but he has had the unique ability to transmit his outlook and dedication to those who worked with him. Since these include an impressive number of the present leaders in the area of physical organic chemistry, it is easy to see why his influence has been so enormous."

Paul Bartlett's life at Harvard during the years of World War II was particularly strenuous. In later years he told a friend that he had spent many nights sleeping in his laboratory and he wondered whether his three children would know him when he came home.

Among Paul Bartlett's achievements known only to his close associates was his expertise in the writing of doggerel. One such example that has come to hand was read at the dinner on November 10, 1967 honoring Louis F. Fieser as Louis retired from the Harvard chemistry faculty. We present the document in concluding this admittedly incomplete biography of a great research chemist and teacher. Paul's death occurred just 20 years after that of Louis and 7 months after that of Mary, whose names appear in the last line of the following:-

Stop any chemistry student in the lab
In Kenya, Venezuela, the Punjab,
And ask: "Who is Organic Chemistry's Czar?"
Then he'll shout "Fieser" no matter where you are.
Who can conceive, in song or even John-verse,
Four decades of an unbe-fiesered Converse?
Twere colorless as Hell without its fire—
Mute as a barber shop without its choir.
I recall his short-lived bout with Minox photography;
Committees to which he brought his chromatography,
Deliberating while there grew the zones
Of pleiadene- or perylene-quinones.
He vied with many a promising young fellow
Who hoped to lead the way to Martius Yellow.
How could he reach the surface in that pool
Of testimonials for medical school?
Come '41, no time for war hysteria,
While working out new ways to beat malaria.
His team was ready to stay at work till hell freeze,
To draft the bats out of their belfries.
Napalm was meant for factories, all quite neuter;
Who could foresee 'twould stop a Dow recruiter?
Louis made flicks to whet the appetite
For lab work; and he taught us not to write:
"100 g were added in and then
Derivatized with C₆H₇N."
Books poured out in an ever growing stream,
To educate the world's professional cream.
Models appeared to make all structures rational.
Sold by the piece at Ronald's First National.
The winter came and the boys just had to get shirts,
They donned illuminated LOUIS sweatshirts.
But now that Louis has a white Mercedes,
He's on his way to Smith to join the ladies.
This gathering of old-time Fieser fans
Wish Louis and Mary the best in all their plans. ◇

Nominations

Aula Laudis

The Northeastern Section annually honors teachers of chemistry at the secondary level in our region by choosing several for selection to the honor society, *Aula Laudis*. Election to membership in *Aula Laudis* is a recognition of excellence in the Teaching of Chemistry at the secondary school level. This recognition is based on both qualitative and quantitative criteria that involve the totality of an individual's participation in and contribution to the teaching profession. Inasmuch as teaching is a skillful art with a wide range of marks of excellence, no one criterion for election to *Aula Laudis* is sufficient and no one criterion is necessary. The following criteria, in their broadest sense, shall be considered by the Selection Committee:

- Having taught chemistry to students who have won state-wide, regional, or national chemistry competitions, such as the Ashdown Examination Award;
- Having received awards for excellence in teaching from state-wide, regional or national organizations;
- Having advanced the scholarship of chemical education, including curriculum design, laboratory development, and the introduction of pedagogical methods and techniques through publication in recognized chemical education journals and/or through presentations at scientific meetings and continuing education symposia;
- Having served as the adviser of extra-curricular activities, such as clubs, science programs, and science talent searches, in which the interest of chemistry students in the subject is advanced and developed;
- Having performed special service to the chemical education community, such as through the organization of

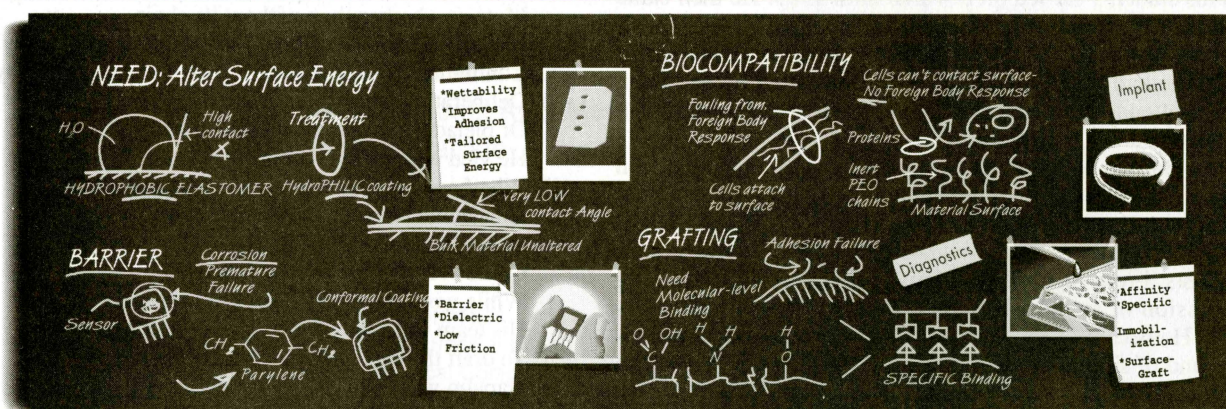
continuing education symposia in chemistry;

- Having demonstrated excellence in classroom teaching as evidenced from written in-class evaluations by supervisors;
- Having had a significant personal impact on students as evidenced by letters from alumni/ae on behalf of the nominee.

The Selection Committee will accept nominations on behalf of active and retired secondary school chemistry teachers; the length of teaching service is not a criterion. The criteria for each final recommendation shall be recorded in the minutes of the Selection Committee.

Nominations, including a one-page summary of the nominee's relevant accomplishments, are to be sent to:

David Olney
P.O. Box 559
Mattapoisett, MA 02739
Nominations are due **February 15, 1998**. ◇



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Book Review

Alice in Quantumland. An Allegory of Quantum Physics,

by Robert Gilmore (Springer Verlag, 1995, 184 pp., \$18.00 hardcover)

Reviewed by Dennis J. Sardella
(Department of Chemistry, Boston College)

By now it has become a truism to say that quantum mechanics is the most successful and accurate physical theory ever developed. Its ability to describe structure and processes on the molecular and subatomic levels, and its predictive power, are remarkable, and its influence in contemporary chemistry is pervasive. Once the province of specialists, it has, like computer usage, undergone a kind of democratization in recent years. Students begin to learn its vocabulary in high school, a process continued and accelerated in college courses, while in upper-level courses and research laboratories its language and the concepts derived from it are ubiquitous. In addition, the availability of moderately priced, powerful microcomputer systems running user-friendly, sophisticated molecular structure packages with graphic interfaces for the visually oriented chemist (for instance, the CaChe® system) has made high-level calculations accessible to virtually anyone.

There is, however, a potential downside to this explosion of the application of quantum mechanics (or perhaps more accurately, molecular orbital theory) among chemists, and it is essentially that familiarity can breed, if not contempt, then a lack of true appreciation. Not so much appreciation of what it can do, as of what it really means. It is practically impossible to impress adequately upon minds jaded by constant exposure to its vocabulary and results just how revolutionary quantum theory really was (and is). There can be a temptation simply to go along, describing quan-

tum events in classical terms, of thinking of electrons as tiny negatively charged "BB's," of orbitals as boxes, and of transitions as so many movements of cars from one garage to another, when in fact reality is far stranger and more intriguing. While this understandable tendency to "put old wine in new skins" probably has no significant effect on the utility of quantum mechanical predictions, it impoverishes its users intellectually, and it would be salutary for most literate chemists to have grappled with the way in which quantum mechanics has changed the intellectual landscape of twentieth century science and philosophy.

There are two ways to go about **acquiring this understanding**. The hard way is to begin to grapple with the basic ideas of quantum theory at the level of a good introductory text, then to study its implications for the nature of reality by looking into the Bohr-Einstein dialogue. This takes a certain amount of intestinal fortitude that only the most relentlessly mathematically and philosophically oriented chemists may possess. The easier (and more enjoyable) way is to read *Alice in Quantumland* by Robert Gilmore.

Written in the style of the classics "Mr. Tompkins in Wonderland" and "Mr. Tompkins Explores the Atom" by George Gamow, and subtitled *An Allegory of Quantum Physics*, *Alice in Quantumland* explores the strange world of quantum reality through the eyes of Alice, a young girl who "falls" through a television screen into a world far stranger than anything she has hitherto experienced.

Alice's first encounter with an electron introduces her to the consequences of the Heisenberg Uncertainty Principle:

"She looked more closely at the [electron] nearest to her and observed a small figure, coming roughly up to her waist. It was exceedingly difficult to make out, as all the time it kept hopping to-and-fro, moving so fast that it was very difficult to see at all clearly.

continued on page 11

... 'Oh please,' said Alice to her first acquaintance. 'Would you be good enough to stand still for a moment, as I really cannot see you at all clearly?'

'I am good enough,' said the electron, 'but I am afraid there is not room enough. However, I will try.' So saying he slowed his rate of jiggling. But as he moved more slowly, he began to expand sideways and become more diffuse. ... 'That is the best I can do,' he panted. 'I am afraid that the more slowly I move, the more spread out I become. That is the way things are here in Quantumland: the smaller the space you occupy, the faster you have to move. It is one of the rules, and there is nothing I can do about it.'

Thus begins Alice's journey through Quantumland, to the Heisenberg Bank, where the Bank Manager in charge of energy loans to virtual particles explains to her that the time

period of the loans is inversely proportional to its size. She travels next to the Mechanics Institute (along many simultaneous paths, a consequence of the principle of superposition), where the Quantum Mechanic introduces her to the phenomenon of interference and to Schrodinger's cat. At her next stop, the Copenhagen School, Alice studies the problem of measurement and the differing answers to the question of how one possible observation can be selected from among all the possibilities that exist, owing to the superposition of states. In the Fermi-Bose Academy, she learns about the differences in behavior between the highly individualistic fermions (e.g. electrons) and the naturally gregarious bosons (photons). After getting better acquainted with virtual particles, she next moves into an area more familiar to chemists by visiting the Periodic Pier and Castle Rutherford, where atoms dwell. Following visits to the Particle MASSquerade and the Experi-

mental Physics Phun Phair, Alice returns home via the television screen through which she had originally fallen to begin her journey.

"She turned to look at the television, which was still operating. The screen showed a group of rather serious folk, arranged carefully on either side of a commentator, who informed Alice that they were about to have a studio discussion on the future of scientific planning in the country. 'Boring,' said Alice. She switched off the television firmly and went outside into the sunshine."

Unlike the impending discussion on the future of scientific planning, *Alice in Quantumland* is definitely not boring. Gilmore, a theoretical physicist at the University of Bristol, has a witty and enjoyable writing style that allows him to present many of the counter-intuitive aspects of modern

continued on page 12

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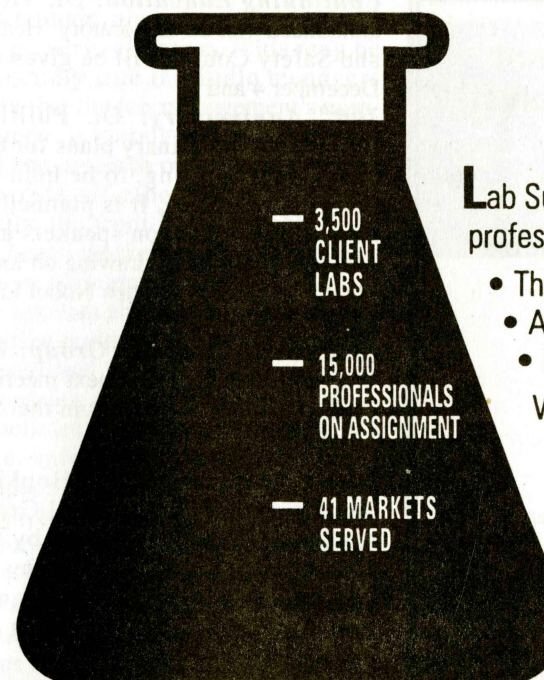


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Book Report

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physics in a way that a general reader can visualize. He also intersperses the text with occasional brief notes that provide succinct statements of the underlying physical principles. While most of his examples are fairly easy to follow, a few are rather challenging. He does a good job of introducing the reader to a strange world that may seem at times more akin to the New Age than the New Physics. In the process, he makes it clear that the quantum revolution is not simply the substitution of one mathematical structure for another, but a fundamental change in the way in which science perceives the nature of reality. Reading *Alice in Quantumland* brought back to me the words of a poem whose author and title I have long since forgotten: "Newton's world of bolts and levers vanished in a shower of dazzling quanta." Sometimes the dazzle can be obscured by wave equations and tables

Board of Directors

Notes of Meeting of October 9, 1997

NOTE: Board Meetings are held on the monthly meeting days at 4:30 p.m. Section members are invited to attend.

Officers' Reports:

Treasurer: Dr. Idelson reported for Dr. Piper that there is a cash balance of \$ 47,000 and that \$666.67 will be each Councilor's/Alt. Councilor's allotment for attending council meetings. The tax exempt status of the Section is still awaiting resolution.

Trustees: Dr. Hopkins commented on the problems of being considered a

of numbers, so that quantum mechanics can seem positively ordinary. Gilmore helps remind the reader that it is anything but ordinary. ◇

private foundation under IRS rules, which had been suggested by legal advice to the Treasurer. Dr. Hopkins also questioned the use of trustees' administered funds for continuing education activities.

Standing Committees:

Program: Programs for January and February are being set: With a speaker from A.D. Little, Inc. on fuel cells for January.

Chemistry Education: Criteria for the *Aula Laudis* recognition were reviewed by Dr. Tanner. After discussion, it was MOVED and VOTED to accept the criteria presented by the committee.

Local Arrangements: Dr. Gleekman raised the issue of costs of the dinners. Should charges be raised to include wine at the social hour? To be resolved at a future meeting.

Nominations: The following were elected as Board Member representatives on the Nominating Committee: Albert Viola, Myron Simon.

Other Committees:

Continuing Education: Dr. Viola announced that the Laboratory Health and Safety Course will be given on December 4 and 5.

100th Anniversary: Dr. Phillips announced preliminary plans for the Centennial Meeting, to be held on Saturday, April 25. It is planned to have three afternoon speakers and one evening speaker, drawing on local notable chemists, perhaps Nobel Laureates.

Medicinal Chemistry Group: Dr. Singer reported that the next meeting would be on "Drug Leads in the 21st Century."

New Business: Dr. Hopkins announced the "Presidential Green Challenge" award sponsored by the EPA to individuals, companies or organizations who have designed chemistry suitable for improving the environment.

Condensed from the minutes of the Secretary, S. Fetela. ◇

Health and Safety on My Mind

The Four A's of Safety

by M.A. Solstad

In learning it is often useful to hang important ideas on a memory hook. In looking back over some old *Health and Safety on My Mind* columns I found the Three A's of Safety written some 16 years ago. Since then, a fourth A has been added.

The foremost A is **Attitude**. Without the attitude that safety is an important, integral, and essential part of research, production, or any other activity, accidents will occur. This attitude toward safety is vital on every level of an organization. It has to start at the highest level of an organization – the CEO, the Dean, or even the Board of Directors or Trustees. But unless middle management accepts this attitude, any safety program will not be very effective. This may be especially true if middle managers think that the top management's commitment is merely window dressing, and that research or production results override all other considerations. Lastly, the front-line troops, be they lab bench workers, students, production or maintenance people, have to buy into this attitude on safety. A very positive multi-level safety attitude is exemplified by some major chemical companies, such as DuPont. However, sometimes the only driving force is a lone safety officer or Chemical Hygiene Officer. This person's efforts are probably doomed to lead to disappointing results. In recent years there have been instances where students from an institution with a strong safety culture have tried to bring these attitudes to the "real world" laboratories with mixed results. Sometimes their efforts have brought about a change for the better in laboratory management's attitudes, a trickle-up result; often the existing culture derides their attitude,

and the former students gradually see safety as a low priority item.

Second is **Awareness**. The best attitude in the world will not keep you safe if you do not have the necessary information. [The recent fatal accident with methyl mercury is an example: Karen Wetterhahn did not know that methyl mercury readily penetrates ordinary laboratory gloves. ed]. Almost any chemist with some years of experience will recall accidents, exposures, or near misses. Without some clearing-house for chemical safety data each instance could be viewed as an aberration, but viewed in context, a pattern may emerge. There are numerous compilations with information of importance for laboratory safety. Bretherick's *Handbook of Reactive Chemical Hazards* is a key resource with which every researcher should be familiar. Jay Young and James Kaufman, both active members of the ACS Division of Chemical Health and Safety collect stories of laboratory mishaps. (Jim is an active member of NESACS). Jay's amusingly written, but instructive tales, appear in

every issue of *Chemical Health and Safety*, published by the Division; Jim has compiled true stories about mishaps in schools and colleges. Meetings and workshops abound at national and regional meetings of the various scientific societies. The Internet has resources, including the *Safety List*, not targeted specifically at laboratories, but nonetheless useful. OSHA's Laboratory Standard requires that laboratory workers be made aware of safe handling procedures for substances they are working with. MSDSs are required for every hazardous in-house chemical. Since most chemicals can be hazardous under some circumstances, that in effect, means MSDSs for all substances. Toxicology reference books should be in every laboratory.

But a safe attitude and good information will not help if you are unaware of what is going on around you in the laboratory or workplace, or if you don't understand the kinds of accidents that might happen. A log and an investigation of near-misses is a must for alerting us to problem procedures

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Health and Safety

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and areas. Jay Young reminds us that, on average, for every accident there were ten near-misses and for every near-miss there were ten unsafe acts.

Once you understand the safe way of carrying out a process, that method of acting must become **Automatic**. One reader of the SAFETYLIST suggested **Automatic Application**. For instance, I am a seat-belt user; when I reach the end of our short road, before entering the heavy traffic on the main road, I automatically check whether I have my lap-belt buckled (the shoulder belt is activated automatically); that action has become automatic. Why do we have fire drills or emergency response drills? So that the safe response will be automatic when seconds count. So too, safety glasses or goggles should be donned automatically when entering a laboratory. Laboratory coats should be removed when

visiting common areas, such as lunch rooms, to avoid spreading chemicals or pathogens.

Proper planning is related to automatic response: The best way to handle an emergency is to have a plan in place. The best way to assure that the plan is effective is to practice: thus fire drills, earthquake drills, emergency response practice.

My husband and I were in the '89 quake in the Bay area. We were not injured, but we developed an intense interest in earthquake news and earthquake preparedness. It so happened, that the Bay area had had an earthquake disaster preparedness drill just a few weeks before the real quake. It is thought that this contributed substantially to effective disaster response and helped to reduce the extent of injury or mortality.

Next is **Authority**. There needs to be some entity with the authority to enforce safety rules. Does the Chemical Hygiene Officer have the authority to discipline those who refuse to act

safely? Just recently, the aftermath of a sodium amide, and possibly a picric acid explosion and fire in an academic laboratory was complicated because only one person knew that those chemicals were present (and improperly stored, at that). A strong sanction on that individual would send a strong message concerning the value that the institution places on safety. It should be made clear that those who act without regard for their safety, or that of their colleagues or coworkers will be disciplined, up to the point of dismissal.

In addition, there should be someone able to authorize funds for equipment, training of staff resources or changes to make the work area, laboratory, or process safer.

With the right **ATTITUDE**, safety **AWARENESS**, **AUTOMATIC** application of safety procedures or systems, and the **AUTHORITY** to discipline backsliders, you should be well on the way to a safer laboratory or workplace. ◇

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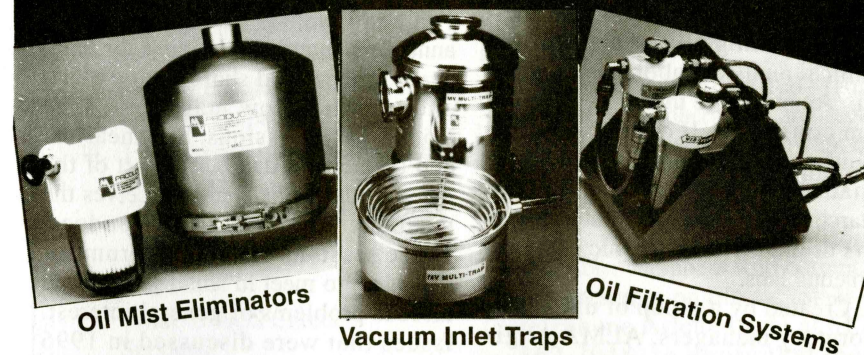
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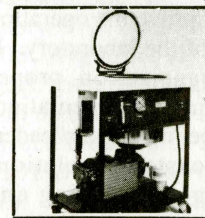
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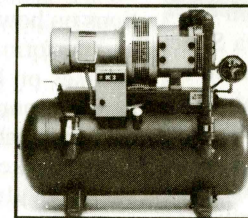
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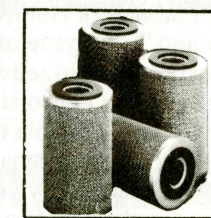
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Serendipity

by Arno Heyn

My dictionary¹ defines *serendipity* as "The faculty of making fortunate discoveries by accident (From the characters in the Persian fairy tale *The Three Princes of Serendip* who made such discoveries, from Persian *Serendip*, Sri Lanka, Arabic *Sarandib*)."

This dictionary goes on at length about Horace Walpole (English author, and inveterate letter writer), quoting one of his letters, January 28, 1754 in which he coined the term. He applied it in the letter to a bit of sought-after society news gleaned by accident during a dinner.

The term has been used often in science in describing accidental discoveries, made while looking for something altogether different.

In the course of a recent trip through Germany I experienced a serendipitous discovery: I was on my way from Karlsruhe to Hamburg, which I intended to do by car in two days, and had been advised by friends that smaller roads along the upper Weser river north of Kassel made a pleasant detour after driving on the fast-paced Autobahn. I followed this advice, stopping at the town of Münden (where the Fulda and Werra rivers meet to form the Weser river). In German, *münden* is the verb of the noun for confluence. This town is famous for its half-timbered houses. Then I followed the smaller road to Bad Karlshafen, a spa with a number of baroque houses, also the southern end of the navigable Weser, therefore called "...hafen", i.e. harbor of Karl (of Hessen), who founded the city in 1699. On the way to Karlshafen I noticed a sign along the road "Gasthof Schöne Aussicht" (Beautiful View Inn), and since lodgings in the spa were rather pricey, I returned the short distance to that Gasthof, finding myself in the small village "Gewissenruh" (repose for the conscience). I stayed at the inn, getting a very clean,

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Serendipity

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tidy room and asked the host about the origin of the name of the village. He told me that a group of adherents of the Waldensian Protestant sect had been forced to flee France in the late 17th century. After several attempts to settle in Italy, Switzerland and Denmark, they were given land by the Duke of Hanover and founded two villages: this one and the nearby Gottstreu (true to God). In fact, that very weekend Gottstreu was to celebrate its 275th anniversary, and Gewissenruh the same the following weekend. Unfortunately my schedule didn't allow my staying on.

There is a small Waldensian church in these villages and most inhabitants are members (as the host said: *we Waldensians...*). From the description in the weekly newspaper I gathered that their faith is similar to that of the Mennonites in emphasizing independence, non-violence and therefore refusal of military service—one source of their problems with governments.

Prosperous farmland surrounds the villages in the floodplain of the Weser and the farmers obviously are doing quite well, judging from their houses and farms.

Such are the serendipitous discoveries one can make when one travels on lesser roads instead of large autoroutes, or with tour buses or by train. The savings of staying in small inns (typically \$20-40 for one person per night, including breakfast, less in shared rooms) just about pay for the rental or lease of a car in a month's time.

So what does this have to do with chemistry? Nothing at all, except that a retired chemist, yours truly, has again found that interesting discoveries may await those who aren't hemmed in too much by the conventional approach. ◇

¹ *The American Heritage Dictionary of the English Language*, 3rd ed. Houghton-Mifflin Co., Boston Mass., 1992

Analytical Laboratory Managers Association

By John T. Pivinski

The Analytical Laboratory Managers Association (ALMA), founded in 1980, is a nonprofit, professional society representing all segments of the chemical analysis laboratory profession. Among more than 300 members from countries all over the world, including the United States, China, Canada, Finland, Venezuela and Antarctica, are the top laboratory managers of industrial, academic and governmental labs.

Created by a group of university laboratory managers, ALMA originated from a need for consistent management practices in the analytical laboratory. It was recognized that managing an analytical chemistry laboratory required a unique blend of technical and managerial skills. The technical skills came as a result of educational experience. The managerial skills were self-taught and, in most cases, were learned on the job in a haphazard manner.

Consistent management practices were hard to come by and seemed to be different depending on the type of laboratory that was managed. Dr. Claude Lucchesi of Northwestern University and Tom Lyttle of Iowa State University recognized the need to bring together a consortium of managers who would be able to share their thoughts on the proper management of an analytical laboratory. Dealing with problems such as staffing, facilities, equipment, maintenance, finance, human resources, training, motivation,

and compensation allowed an interchange of ideas that could be used in almost any analytical laboratory setting.

In the seventeen annual meetings since 1980, ALMA has looked at a variety of managerial themes. Every annual meeting includes time for managers to meet and share their experiences with fellow managers. The Round Table sessions, held near the end of the first day, are a part of the meeting that consistently receives the most acclaim from past attendees. These sessions provide a forum for managers to meet in small groups and discuss problems of general interest. Issues that were discussed in 1996 included:

1. Instruments/Hardware: Purchase, Maintenance, Retiring
2. Software for PC/Instruments: Problems, Upgrades, Contracts
3. People Problems
4. Care & Feeding of Analytical Laboratory Managers: Managing multiple priorities, remaining technically current, stress management

Besides the annual meeting, ALMA has created a course that is tailored to the Analytical Laboratory Manager. This course provides the manager with guidelines and suggestions on how to improve the operation and performance of the laboratory. It focuses on lab organization, proper staffing, purchasing instrumentation, designing lab space, managing/leadership, marketing/customer relationships, evaluating, developing and maintaining staff, communications and laboratory performance evaluations.

ALMA's bulletin is published quarterly and contains articles of interest to laboratory managers. ALMA also sponsors a journal called "Managing the Modern Laboratory." Members receive a substantial discount over nonmembers. Submission of articles to either the bulletin or journal is welcomed and should be directed to

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3. Developing the Right Picture: Resume Preparation.
4. The Essence of a Winning Interview.

These may be borrowed for a one week period.

B. Brochures

1. What is ACS Career Services?
2. Targeting the Job Market.
3. Resources for Career Management (Resources for conducting a chemical related job search).
4. Current Trends in Chemical Technology, Business, and Employment.
5. The Interview Handbook
6. Tips on Resume Preparation

All of the above are available free of charge.

C. Listings

1. Employer Mailing Lists - a list of employers in the USA, by states, who have used ACS employment services.
2. The list of positions available and employers registered at the last ACS Meeting.

D. Resumes

Resumes are solicited from NESACS members who are seeking positions, and will be kept on file for a period of six months, unless renewed.

Employers may list positions available. Members who currently have resumes on file are asked to telephone Arlene Light at 617-862-3048 to verify that their resume is to remain on file. If not confirmed resumes will be deleted February 1, 1998.

Information about all of the above may be obtained by calling Truman or Arlene Light at 617-862-3048 or by e-mail: tlight@aol.com. ACS members in New Hampshire may contact Sonja Fetela at 603-352-1415, or by e-mail: info@polyonics.com

David Green, Argonne National Laboratory, 9700 South Cass Avenue, Bldg. 205, Argonne, IL 60439-4837 (E-mail: green@cmt.anl.gov). Information on becoming a member should be directed to Judith Sjoberg, ALMA, 1201 Don Diego Avenue, Santa Fe, NM 87505. Judith can also be reached at 505-989-4683. ALMA also has a web home page at <http://www.siu.edu/departments/shops/almahome.html>

John T. Pivinski is the Laboratory Director of the American Water Works Service Company Research and Development Laboratory in Belleville, Illinois. He is a past president of ALMA and is currently serving as Chairman of the Publicity Committee for the Board of Directors. ◇

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SOCIETY

Nomination

James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry

Nominations are being received for the 1998 James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry. The Norris Award, one of the oldest awards given by a Section of the American Chemical Society, is presented annually by the Northeastern Section. The Award consists of a certificate and an honorarium of \$3000. Nominees must have served with special distinction as teachers of chemistry at any level; Secondary school, college, and /or graduate school. Since 1951 awardees have included eminent and less-widely-known but equally effective teachers at all levels. The awardee for 1997 was Professor A. Truman Schwartz of Macalester College, St. Paul, Minnesota.

Nominations for 1998 will be received until April 15, 1998. The nominating material must be limited

to 30 pages and focus specifically on the nominee's contribution to and effectiveness in teaching chemistry, as distinguished from research. These qualities are demonstrated by a condensed curriculum vitae as a portion of a nominating letter which, in turn, is supported by as many seconding letters as are necessary to convey the nominee's qualification for the award. These may show the impact of the nominee's other activities in chemical education, such as textbooks, journal articles, or other professional activity at the national level. Materials should be of 8 1/2 by 11 inch size, but should not include books or reprints.

Nominations should be sent before April 15, 1998, to Dr. Charles L. Braun, Department of Chemistry, Dartmouth College, Hanover, NH 03755-1477. ◇

Calendar

For additional information, call:

Boston College - (617) 552-3605
Brandeis University - (781) 736-2500
Dartmouth College - (603) 646-2501
Harvard University - (617) 495-5333
Mass. Inst. Technology - (617) 253-4080
Northeastern Univ. - (617) 373-2822
Tufts University
Chemistry, Medford - (781) 627-3441
Chem. Eng., Medford - (781) 627-3900
UMass Dartmouth - (508) 999-8232

Check the NESACS Homepage for late additions:
<http://www.tiac.net/users/obermayr/nesacs>

Dec. 17

Dr. Eric Brown (Astra Research, Cambridge)
"Peptidoglycan of Helicobacter Pylori"
Mass. Inst. of Technology
Faculty Club, Glycobiology Dinner
Meeting at 6:30 PM
Call (617) 642-0025 for reservations

Jan. 8

Prof. Mark Lautens (Univ. Toronto)
"TBA"
Mass. Inst. of Technology
Room 6-120, at 4:00 PM

Jan. 20

Prof. David Austin (Yale Univ.)
"A Scaffold Approach Toward
Macromolecular Binding"
Tufts University
Pearson Hall, Room 106, at 4:30 PM

Jan. 22

Prof. Bruce Novak (Univ. Mass, Amherst)
"TBA"
Mass. Inst. of Technology
Room 6-120, at 4:00 PM

Jan. 27

Prof. Axel Brunger (Yale Univ.)
"TBA"
Brandeis University
Gerstenzang, Rm 122, at 4:00 PM
Prof. Jack Szostak (Mass General Hospital)
"In Vitro Directed Evolution of RNA and
Proteins"
Tufts University
Pearson Hall, Room 106, at 4:30 PM

Notices for the Nucleus Calendar should be sent to:

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