Monthly Meeting
Felice Frankel on Envisioning Science

Trip to Cuba
ACS delegation attends Conference on Chemistry in Cuba

Book Review
“A Brief Account of Radioactivity” Review of an Oldie but Goodie

Summer Scholar Report
Toward a Crystal Structure of an E. coli DNA component, by John Huetsch and coworkers
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Call for Papers
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**New Members**

Includes members relocated to the Northeastern Section

**Invitation to attend a Section meeting**

You are cordially invited to attend one of our upcoming Section meetings as guest of the Section at the social hour and dinner preceding the meeting. Please call Marilou Cashman for a reservation, letting her know that you are a new member.

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**Esselen Awardee Announced**

**Bruce D. Roth to receive the Gustavus J. Esselen Award**

Dr. Roth is the Vice President of Chemistry at the Pfizer Global Research and Development, Ann Arbor, Laboratories. He has been selected as the 2003 Esselen Awardee for his synthesis of cholesterol-lowering compound atorvastatin, which has been marketed as Lipitor®, one of the best of the HMG-CoA reductase inhibitors, “statins.”

Chemically, atorvastatin is a pyrrole derivative: \([R-(R^*,R^*)]-2-(4-fluorophenyl)-\beta,\delta\-dihydroxy-5-(1-methylethyl)-3-phenyl-4-[[phenylamino]carbonyl]-1H-pyrrole-1-heptanoic acid,

continued on page 6
Abstract

Envisioning Science, Making Good Science Look Good

Human beings assimilate the world chiefly through their sense of sight. It is not surprising, therefore, that scientists continually seek new and better ways to see in order to become better observers. With only the occasional exception, science forgets that the phenomena whose characteristics it seeks to understand may be stunningly beautiful when skillfully visualized. Unfortunately, however, generating images in the laboratory is usually carried out with only minimal expertise with virtually no consideration for their aesthetic or communicative qualities.

This talk will encourage researchers to consider a new approach for making science images and figures for the following reasons:

- As research becomes more interdisciplinary, illuminating and intelligent images and various forms of data will become more useful in communicating to various fields of expertise.
- As investigators spend more time making these new images of research to communicate to a larger community, they will see their work differently, expand the way they think about their work and therefore the way they envision it.
- Compelling and accessible pictures and data representations will draw the public’s interest to the world of research.

Biography

Science photographer Felice Frankel is a research scientist at the Massachusetts Institute of Technology. Her work is supported by the School of Science, the School of Engineering and the Office of Research. Her latest book Envisioning Science, The Design and Craft of the Science Image has just been published by The MIT Press, Cambridge, Ma.


Her work has appeared on the covers and inside pages of Nature, Science, Wired, Newsweek, Scientific American, Discover Magazine, New Scientist and was profiled in the New York Times, LIFE Magazine, the Boston Globe, the Washington Post, the Chronicle of Higher Education, National Public Radio’s All Things Considered, Science Friday and the Christian Science Monitor. She has exhibited internationally and her present exhibit, Envisioning Science is traveling the United States.

Frankel was awarded a Guggenheim Fellowship, and has received grants from the National Science Foundation, the National Endowment for the Arts, and several other Foundations. She was a Loeb Fellow at Harvard University’s Graduate School of Design for her previous work photographing the built landscape and architecture. She is a Fellow of the American Association for the Advancement of Science. Her web site is: http://web.mit.edu/felicef/

Have you looked at the new NESACS website?

WWW.NESACS.org
The Nucleus March 2003

Call for Papers
Undergraduate Research Poster Session at the 226th National ACS Meeting.
New York, NY, Sept. 7-11, 2003

The ACS invites undergraduate students to submit abstracts of their research papers for presentation at the Undergraduate Research Poster Session (URPS) which will be part of the extensive program for undergraduates at this meeting. Submit your abstract electronically by May 3, 2003 to <www.acs.org/meetings>. Click on the CHED division and then select the URPS site that is appropriate to the subject of your paper. Please follow the directions carefully.

For further information, contact:
LaTrease Garrison
ACS Student Affiliates Program
1155 Sixteenth St., NW
Washington, DC 20036
Tel: (800) 227-5558, ext. 6166
e-mail: SAprogram@acs.org

Esselen Awards
Continued from page 4

Calcium salt (2:1) trihydrate. (C33H34FN2O5)2.Ca(OH)2.3H2O.

Dr. Roth received the Ph.D. from Iowa State University. He will receive the award at the April 10, 2003 monthly meeting of NESACS at Pfizer Hall in the Mallinckrodt Chemistry Building, Harvard University.

The Esselen Award is made to "perpetuate the memory of Gustavus John Esselen," a past chair of the Northeastern Section. The award is conferred "to recognize and reward a chemist whose scientific work and technical work has contributed to the public well-being and has thereby communicated positive values of the chemical profession." Awardees have to be residents of the United States or Canada.

Prior to the meeting, Dr. Roth will be honored at a reception and dinner at the Harvard Faculty Club.

Details of the meeting will be in the April issue of The NUCLEUS.

When you ask, "what must I do to move up the ladder of success in my profession," undoubtedly, you will get the response, "Network, Network, and Network!" But what is effective networking and how do we go about doing it? A very small number of people have been schooled in the "art of networking", most likely not chemists. Most people stumble on something that works, but most of us don't really have a clue! Deep down we know that, if done well, it can have short and long-term benefits, but HOW? Attila E. Pavlath, Immediate Past-President ACS wrote (C & EN, Dec. 2, 2002) "Our members, young and old, B.S.s and Ph.D.s, want more than journals and meetings. They want help with their careers."

How can we facilitate that at the local section level? One way is for each of us to be diligent in our efforts to make NESACS monthly meetings more welcoming. We must pledge to engage in one-to-one conversations. Yes, it is good to see old friends and colleagues, but how about broadening the circle to include one or two new 'friends'?

Eli Pearce, Past-President, ACS and Elsa Reichmanis, current ACS President mentioned the need for "communication" at all levels in all kinds of ways. As chemists we communicate all the time: by lab notebooks, written reports, journal articles and books. But what about conversation? Especially the face-to-face kind! Many of us are scared to approach a person whom we don’t know, that is normal. But think of it this way, we all have something in common: our love of chemistry or we love chemists.

I could talk about what I observe happening, or not happening, at NESACS monthly meetings, but let's not dwell on the past. What is important is to think of ways that we ALL can make the experience welcoming and memorable so that members will look forward to coming again, and again, and again.

Here are some ways we can improve the networking and/or ‘peer mentoring’.

Feel free to write to me, or send e-mail, with your suggestions about how to make this a reality (no phone calls, please, I might mistake you for a telemarketer!) Even better, contribute a short article to The Nucleus. I want to establish a regular column, something like “Meeting NESACS Members” where I report on three different people whom others or I met at the monthly meetings. So send me information on those you meet at NESACS monthly meetings, not just your ‘old’ buddies, but some new acquaintance. Yes, it does mean you have to make the effort to talk with at least one or two people you have not talked to before. So what kind of information do you need? Nick-names’, alias’s, (Silicon-Girl), areas of chemical interest, retired or active. Tell us something interesting about the person, with due respect for privacy.

How can we make this networking a reality?

• People must be receptive to approach strangers and introduce themselves.
• People must be receptive to this approach, there is nothing more chilling than to be ignored or shut out of a conversation.

So how can we identify willing participants? Maybe we should have buttons with three categories.

A. ☺ Yes, I am friendly, I will talk with you!
B. ☻ No, leave me alone, I just want to talk with my old buddies!
C. ? Maybe, I am scared but I am game, please talk to me!

So which are you, and are you willing to undergo a chemical trans- continued on page 7
**Member News**

**Awards**

**Philip S. Baran**, Harvard, is to receive the *Nobel Laureate Signature Award for Graduate Education in Chemistry* at the upcoming New Orleans Meeting. The award is for work done (with Nicolaou, preceptor) at the Scripps Research Institute and the University of California. He will present the award address at the ORG Division.

**William S. Hancock**, Northeastern University, is to receive the *ACS Award in Chromatography* at the New Orleans Meeting for his work in analytical biotechnology, particularly in adapting HPLC techniques to the separation of peptides and proteins. His award address will be presented at the Analytical Division.

**Peter H. Seeberger**, M.I.T., is to receive the *Arthur C. Cope Young Scholar Award* (one of two) at the New York National Fall Meeting in September. He will give his award address in the ORG Division.

**Dietmar Seyferth**, M.I.T., is to receive the *Arthur C. Cope Senior Scholar Award* (one of four) also at the New York Meeting and he also will deliver his award address at the ORG Division.

**Christopher T. Walsh**, Harvard Medical School, will receive the *Alfred Bader Award in Inorganic or Bioinorganic Chemistry* at the upcoming New Orleans ACS Meeting. He will deliver his award address at the ORG Division.

**Robert G. Bergman**, University of California at Berkeley, will receive the Northeastern Section’s *James Flack Norris Award in Physical Organic Chemistry* at the New Orleans Meeting. He will present his award address at the ORG Division.

*Congratulations to these awardees!*

**Make Friends**

*Continued from page 6*

**formation?**

Jean Fuller-Stanley (NESACS Chair-elect 2003)
Associate Professor of Chemistry, Wellesley College
<jfullers@wellesley.edu>

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**ACS Delegation Travels To Cuba**

Morton Hoffman and Zafra Lerman*

Thirteen chemical educators traveled to Cuba recently under a specific license issued by the U.S. Department of the Treasury to the American Chemical Society to attend the 17th Conference of Chemistry in Santiago de Cuba, December 4-6, 2002. The Departamento de Química in the Facultad de Ciencias Naturales of the Universidad de Oriente sponsored the conference, which included plenary lectures, oral and poster presentations, and workshops. More than 300 chemists from North America, Latin America, and Europe participated in sessions on physical, analytical, environmental, inorganic and organic chemistry, chemical engineering and chemical education.

The following traveled on the ACS license: Carmen Gauthier (Florida Southern University), Morton Hoffman (Boston University), Lynn Hogue (Miami University), Zafra Lerman (Columbia College), Cathy Middlecamp (University of Wisconsin, Madison), Martin Minelli (Grinnell College), David Morton (Columbia College), Maria Oliver-Hoyo (North Carolina State University), Jimmy Reeves (University of North Carolina at Wilmington), Jerry Sarquis (Miami University), Mickey Sarquis (Miami University), Hessy Taft (Educational Testing Service), Carol Venanzi (New Jersey Institute of Technology). Mickey Sarquis was the 2002 chair of the Division of Chemical Education (CHED), and Jerry Sarquis is presently the secretary of CHED.

None of these chemists received any financial support from ACS or CHED toward the trip; many paid their own way while others received financial assistance from their institutions.

A pre-conference workshop on chemical education was offered on December 3 to college chemistry teachers, which included the following presentations:

Cathy Middlecamp, “Teaching the Nucleus March 2003 7

* Zafra Lerman was the James Flack Norris Awardee of the Northeastern Section for 2002 for her outstanding achievements in the teaching of chemistry. She addressed the Section at its November 2002 meeting.

Photos by M. Hoffman
ACS Trip to Cuba

Continued from page 7

chemistry in 'real world' contexts"

Maria Oliver-Hoyo, “Estrategias para mejorar el aprendizaje de conceptos y las actitudes de los estudiantes hacia la química”

Jimmy Reeves, “Technology and Distance Education: New possibilities for solving old challenges”

Carmen Gauthier, “How can one do research in a predominantly teaching institution with limited resources?”

Professors Marieta Gomez Serzano and Luis Bello of the Universidad de Oriente together with Zafra Lerman organized a symposium on chemical education.

Many of the ACS delegation had prepared their visuals in both English and Spanish, making it easier for the Cuban participants to follow the presentations. In this symposium, the ACS members interacted with the Cuban participants, sharing important information about the courses that they teach. The contribution of CHED to the symposium included the following presentations:

Morton Hoffman, “New strategies for teaching general chemistry”

Jerry Sarquis, “Peer-Led Team Learning: The Workshop Model”

Zafra Lerman and David Morton, “Chemistry for non-science majors: Computer animation of chemical concepts”

Mickey Sarquis, “A formula for effecting student learning in chemistry: Kinesthetic activities, dramatic simulations, and model development”

Lynn Hogue, “Teaching chemistry with toys”

Hessy Taft, “Evaluating science comprehension among primary and secondary students”

In addition to the chemistry faculty which participated in the symposium on chemical education, forty undergraduate chemistry majors from the Universidad de Oriente received special permission from their professors to miss classes in order to attend the presentations. The members of the ACS delegation were extremely impressed with the students’ knowledge of chemistry, enthusiasm to participate, level of maturity, eagerness to interact with the American visitors, and their expressed desire to remain in contact. This group of students spent two days with the ACS delegation, talking about their studies, and trying to find out as much information as possible continued on page 9
about the ACS, chemistry, and the United States. It was a wonderful experience for the students and ACS members alike, to interact so closely with each other during the symposium, in informal scientific conversations, and during lunch. The students stated that they learned a great deal from this exchange. They expressed their interest in maintaining a connection with the ACS members; much e-mail has been exchanged since the conference.

The ACS delegation members were treated with great respect, attention, warmth, and consideration by their Cuban hosts. Conference organizers Bello and Gomez repeatedly stated their appreciation for the contributions made by the delegation to the conference, and expressed their gratitude to the ACS for helping to make the conference a success.

As is usually the case when one intends to travel officially to Cuba, the most difficult and rate-limiting step is the obtaining of a license from the Treasury Department, which is responsible for the enforcing of the forty-year old U.S. embargo against that island nation. The ACS Division of Education and International Activities submitted the request for this license months in advance, but repeated phone calls to the Treasury Department requesting clarification of its status always confirmed only that it was “in the queue.” As the date of the conference approached closely, Zafra Lerman obtained the assistance of her Congresswoman, Jan Schakowsky of Illinois, who urged the Treasury Department to issue the license in time for the trip to take place.

Most of the group entered Cuba on a late-morning Aerocaribe flight from Cancun, having spent the previous night there; others traveled by chartered flights (using the aircraft and crew of American carriers) from Miami and New York. Upon arrival at the international terminal in Havana, where one has the option to get a Cuban entry stamp in the passport, the group from Cancun was shuttled to the domestic terminal on the other side of the airport. The rest of the afternoon into the evening was then spent waiting for the flight to Santiago de Cuba. It seems that domestic flights do not adhere to any published schedule; flights leave when the equipment (and presumably a crew) is available. Although our trip to SCU from HAV was many hours late (by American time standards), the good news was that we flew in a spanking new Airbus 320 that could not have had more than 10,000 miles on the odometer. Upon our arrival at about 9:30 p.m., we were greeted by Luis Bello, taken to our hotel, and fed the first meal we had had since breakfast in Cancun. Most of us got to sleep by midnight with a 7:45 a.m. pickup scheduled for the next day to bring us to the opening ceremonies of the conference, which was held at the convention center.

At the closing banquet of the conference, Zafra Lerman addressed the attendees on behalf of the ACS. She thanked the organizers, and expressed the hope that collaborations would continue between chemists from both countries.

The ACS delegation returned to Havana (four hours behind schedule) aboard a Cubana Airlines YAK-42, a Russian-made jet that had already seen better days several decades ago. A night had to be spent in Havana in order to fly early in the morning (7 a.m. flight, 5 a.m. airport check-in, 4 a.m. hotel pick-up) to Cancun and connect back to the U.S.

While in Havana, the group met with Professor Roberto Cao and Associate Dean Georgina Aguero of the Department of Chemistry of the University of Havana. An extra and unex-
Book Review

A Brief Account of Radio-activity

Reviewed by Julian Bullitt*
With this review we initiate what is intended to be a series of occasional reviews of ‘Great Books’, vintage chemistry books (texts or monographs) that were pioneering in their approach to chemistry or have had a significant impact on generations of chemists. We invite our readers or prospective reviewers to contact us with suggestions for future reviews. Please, include the author, title, publisher and approximate date of publication, along with a brief explanation of the book’s importance.

My niece and nephew gave me a small book this summer—Radio-activity by Francis P. Venable. I found it fascinating as a historical snapshot of the knowledge of radioactivity twenty years after its discovery, and of atomic structure during the quantum revolution. My father James Bell Bullitt, Jr. (1906–1957) signed the book “J. B. Bullitt, Jr, U.N.C, Chapel Hill, N.C., March 1923.” He would have used the book as a freshman at North Carolina studying general chemistry, probably under Professor Venable. He earned a B.S and M.S in chemistry at Chapel Hill. I expect that he gave it to my sister when she was studying freshman chemistry in 1956–1957. I wrote this review for members of my family most of whom are not scientists.

Radio-activity was prepared to supplement a class in general chemistry in the early part of the twentieth century. “Such a course dealing with the composition and structure of matter is left unfinished and in the air, as it were, unless the marvelous facts and deductions from the study of radioactivity are presented and discussed.”

It gives the basics of the field that college freshmen or “busy men in other branches of science” might wish to know in the midst of a revolutionary period in physics and chemistry. Recognizing that the description he is giving was incomplete, Venable emphasized experimental data over theory. “Theories cannot be avoided, but the facts remain while theories grow old and are discarded for others more in accord with the facts.”

Venable (1856-1934), Professor of General, Analytical and Applied Chemistry at the University of North Carolina, was chairman of the Chemistry Department, president of the University.

* Julian Bullitt retired from Polaroid Corp after 27 years in various technical positions, most recently as a Research Fellow and Director of the Image Science Laboratory. He has an A. B. from Princeton University and a Ph. D. in Inorganic Chemistry from M. I. T.
Radiation from 1900 to 1914, and president of the American Chemical Society. He authored other books including A Short History of Chemistry and Periodic Law. He consulted for Thomas Willson and James Morehead on an electric furnace product that proved to be calcium carbide and the gas it evolved with water was acetylene. Both Willson and Morehead subsequently made fortunes from acetylene, and their manufacturing process eventually gave birth to Union Carbide.

Radioactivity consists of six short chapters: Discovery of Radioactivity, Properties of the Radiations, Changes in radio-active bodies, Nature of the Alpha Particle, Structure of the atom and Radio-activity and Chemical Theory.

Chapter One describes the discovery of X-rays by Roentgen (1895), and the discovery by Becquerel (1896) that uranium and thorium would also expose photographic plates. Marie Curie noted that a large number of minerals containing uranium or thorium were much more active than the pure elements, and she and her husband Pierre Curie subsequently isolated various active fractions from pitchblende, UO2. One very active substance isolated was named polonium. Another substance isolated with barium salts was named radium. The Curies also determined that the lead found in pitchblende was radioactive and that it had a different atomic weight than ordinary lead. (actually, the end-product of uranium-238 decay is stable Pb206, ed.)

Chapter Two describes alpha, beta and gamma radiation and the devices used to measure them, including the Wilson cloud chamber. Alpha rays were described as having a positive charge and seeming to be positive ions. Beta rays are negatively charged and “are identical with the cathode rays and are negative electrons.” Electrons are always described in the book as “negative electrons.” Gamma rays are not deflected by magnetic fields and appear “analogous to the X rays and are of the order of light,” but substantially more penetrating than X-rays. We, of course, understand today that gamma rays typically have 100 times the energy of X-rays.

Chapter Three describes the different substances that can be extracted from uranium and thorium salts. Radioactivity in rubidium and potassium is noted but “the last two, while feebly active themselves, do not form any secondary radio-active substances, as far as is known.” Some of the new elements are described as having chemical properties identical to those of a known element but differing only in atomic weight. Venable also describes the uranium, thorium and actinium decay series.

Chapter Four discusses the nature of the alpha particle. It is positively charged, with twice the charge of the electron, an atomic weight of four, and forms helium atoms.

Chapter Five introduces the structure of the atom by describing the properties of the newly discovered element radium, what we describe today as the isotope Ra226. Venable notes that the alpha particle emissions from radium chemicals

“produce marked chemical effects on a number of substances,” including the decomposition of water into hydrogen and oxygen. Radium alpha particle emissions generate an amount of heat noted to be much in excess of that from the combustion of hydrogen. “Such a production of energy so far passes all experience that it becomes almost inconceivable.” Rutherford “offered the hypothesis that the atoms of certain elements were unstable and are subject to disintegration.” Rutherford’s atomic description is next introduced—

“a central charge of positive electricity surrounded by a number of rings of negative electrons. ... The central system of the atom is from some unknown cause unstable, and one of the helium atoms escapes from the central mass as an alpha particle.” “In this picture energy and matter lose their old-time distinctness of definition.”

This is presumably an oblique reference to the theory of relativity. On discussing Rutherford’s alpha scattering experiments, Venable points out that “the central charge in an atom corresponds to about one-half the atomic weight multiplied by the charge on an electron.”

Chapter Six describes how radioactivity might help enhance chemical theory. In particular Venable illustrates how the periodic system can be better understood by not arranging the elements according to their atomic weight but rather by the then-new concept of atomic number. Moseley’s data on the X-ray spectra of the elements could be explained by “a fundamental quantity which increases in units from one element to the next.” Using this explanation, Venable shows how the decay of uranium by the emission of eight alpha particles eventually produces lead. The problem noted is that the resulting lead appeared to have an atomic weight of 207.17, while this model predicts an atomic weight of 206. “It is known only that the end product would probably be some element closely resembling lead chemically and hence difficult or impossible to separate from it.” The stable lead-like decay product of thorium has an atomic weight of 208.4. Venable next describes the work of Frederick Soddy in rationalizing the decay series described in Chapter Three by postulating a number of species with differing atomic weights but with identical chemical properties and atomic spectra. “Soddy has suggested the word isotope for the element and isotopic for the property, and these names have come into general use.”

The quantum revolution began in 1900 with a paper by Max Planck, who had been warned as a student that physics was a closed subject and that no more important discoveries would be made. Planck described the radiation spectra of black bodies by requiring that these thermal oscillators behaved as if they were restricted to discrete energy levels (E = nhν, where n is an integer, h is now known as Planck’s constant, and ν is the oscillator frequency). In 1905 Albert Einstein wrote three important papers: one a
statistical mechanical explanation of Brownian motion, the second proposing the special theory of relativity, and the third on the photoelectric effect. To describe the photoelectric effect, Einstein postulated that light consists of a beam of corpuscles of energy $h\nu$. When a metal absorbs a corpuscle, an electron would gain that energy. This approach explained the data well.

At the same time, experimental physicists from the English school described the properties of the atom, but without a satisfactory theoretical explanation. J.J. Thomson (1897) discovered the electron. When Thomson measured the mass of the electron as one two-thousandth of the mass of the hydrogen atom, it became clear that the atomic mass was associated with the positive charge. Ernest Rutherford studied the scattering of alpha particles by thin metal foils. Rutherford (1911) postulated that the atom had its positive charge and essentially all of its mass concentrated in a small region, now called the nucleus. The electrons needed to balance that nuclear charge were presumed to be distributed uniformly on the surface of spheres of atomic dimensions like a miniature solar system. Electromagnetic theory predicted that the Rutherford atom to be unstable, with the electrons eventually spiraling into the nucleus while emitting light.

This quandary led Niels Bohr (1913) to describe the spectra of the hydrogen atom by postulating that the angular momentum of the electron was quantized in units related to Planck’s constant $h$. The energy is then quantized again as $E = h\nu$. There was no understanding why quantization is required, but the Bohr atom and its enhancements did explain the atomic emission spectra as well as the photoelectric effect. It was not until Louis de Broglie, Erwin Schroedinger, and Werner Heisenberg proposed quantum mechanics during the period 1923-1926 that quantization became understood.

The following web site has more on radioactivity and atomic structure: [http://dbhs.wvusd.k12.ca.us/Chem/TeamIndex.html](http://dbhs.wvusd.k12.ca.us/Chem/TeamIndex.html)

This 1917 book was written for a freshman chemistry class. As a result, Chapter Six focuses on the periodic table. Venable introduces a number of new and revolutionary concepts: the Rutherford atom (1911) and how that describes the alpha particle scattering. Both Moseley’s 1913 work on X-ray spectra and Soddy’s 1913 rationalization are used to base the periodic table on atomic number rather than atomic weight. The Bohr atom (1913) is not mentioned since it does not add to the discussion, other than in replacing the unstable Rutherford atom with another model whose stability is ad hoc; furthermore, the quantum concept was quite speculative in 1917. The quantum mechanical basis of the periodic table had to wait for another decade for the Schroedinger wave equation of 1926.

Uranium is known, but only as the isotope $^{238}\text{U}$. Venable hypothesizes $^{234}\text{U}$ as a decay product. $^{235}\text{U}$, present at only 0.7%, was then unknown. Its separation from $^{238}\text{U}$ would have to wait until the 1940s. As a result, Soddy and Venable could not explain the source of the actinium alpha decay series that we now know originates with $^{235}\text{U}$.

In 1917, the only radioactivity known was the result of the uranium, thorium and actinium alpha particle decay series, with the two exceptions noted in Chapter Three — rubidium and potassium. $^{40}\text{K}$ and $^{87}\text{Rb}$ are products of uranium fission. This is the only evidence presented that requires the other decay mechanism — nuclear fission — that was discovered in 1938.

Venable acknowledges in the Preface his “obligations to Professor Bertram B. Boltwood for his helpful suggestions.” Boltwood (1870-1927), a physicist at Yale, identified a number of the intermediate decay products in the uranium and actinium decay series and suggested dating minerals by the ratio of uranium to lead. I am surprised that his work on isolating ionium, now known as $^{230}\text{Th}$, is not mentioned.

Professor James Jorgenson, chair of the chemistry department of Carolina, noted

“It astonishes me to see what was known about radioactivity at the time of the book’s printing in 1917. Even more astonishing is Venable’s detailed knowledge of the topic, his understanding of atomic theory, and the connections he makes with periodicity."

There is further evidence of the advanced nature of Radio-activity relative to another text in use at that time. I have my father’s copy of the 1923 edition of Chemical Principles by Arthur A. Noyes and Miles Sherrill, 1923. He used it in the fall of 1925 in Chem 83, Advanced Physical Chemistry. This text was in active use at MIT for more than fifty years – in 1966 my wife used the 1938 edition in a graduate level Chemical Thermodynamics course. Page 95 of the 1923 edition has a section on the relation of atomic weights to the periodic law that the 1938 edition omits. “When the elements

“When the elements are continued on page 13

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Candidates for Election in 2003

* candidate for re-election

Chair-Elect
Ernest Groman
Amy Tapper

Secretary
Michael Singer*

Trustee
Joseph Lima*

Councilors/Alternate Councilors
Michaeline Chen
Catherine Costello*
Mark Froimowitz
Wallace Gleekman*
Lowell Hall
Arno Heyn*
Patricia Mabrouk
Howard Mayne*
Julia Miwa
Dorothy Phillips*
Michael Singer
J. Donald Smith
Alfred Viola*
David Warr
Barbara Wood*

Director-at-Large
Henry Brown*
Sarah Iacobucci
Stephen Lantos
Robert Umans

Nominating Committee
Patrick Gordon
Donald Rickter
Myron Simon
Dean Wilcox

Esselen Committee
Mukund Chorghade
Martin Idelson
William Klemperer
Robert Langer

Richards Committee
Amir Hoveyda
Stephen Lippard
Thomas Tullius
Gary Weisman

Morton Z. Hoffman, Chair, Nominating Committee

Summer Scholar Report

Toward a Crystal Structure of the Escherichia coli DNA Gyrase A Subunit

John Huetsch*, Alex Ruthenberg,
Gregory Verdine
Department of Chemistry and Chemical Biology, Harvard University

Topoisomerases are a class of enzymes which catalyze changes in the topological state of DNA. These enzymes are important for relaxing DNA supercoils generated during replication and transcription, decatenating intertwined chromatids, and regulating chromatin organization. There are two general classes of topoisomerases: type I topoisomerases catalyze single-strand DNA nicks, while type II topoisomerases induce double-strand breaks. Most type II topoisomerases catalyze the elimination of supercoils and the relaxation of supercoiled DNA. DNA gyrase, a prokaryote-speck type II topoisomerase, is unique in the realm of topoisomerases in that, in addition to relaxing supercoils, it is also capable of generating negative supercoils in DNA using the free energy derived from ATP hydrolysis1.

In its active form, DNA gyrase is a tetramer, consisting of a pair of A subunits and a pair of B subunits. GyrA is involved in the breakage and reunion of DNA and GyrB functions as an ATPase. Limited proteolysis of the continued on page 14

Book Review

Continued from page 12

arranged in the order of the so determined atomic weights, it is found that there is a progressive change in the various properties of the elementary substances and their compounds and a periodic recurrence of similar properties.”

Remarkably, Venable introduced atomic number to freshmen whereas Noyes did not mention it six years later in a text aimed at “junior, senior or graduate students in physical chemistry.” Noyes, of course, was one of the preeminent physical chemists of that era. In 1903 he created and directed the Research Laboratory of Physical Chemistry at MIT until he went west as one of Caltech’s founding “big three” in the early 1920s.
GyrA subunit generates two tryptic fragments, a 64-kDa N-terminal fragment and a 33-kDa C-terminal fragment. The crystal structure of the 64-kDa fragment of GyrA has been solved, revealing it to be a breakage-reunion domain that is highly conserved among prokaryotic and eukaryotic type II topoisomerases.

The function of the 33-kDa C-terminal fragment of GyrA remains more of a mystery. This region is prokaryote-specific; it is not conserved among eukaryotes. This C-terminal domain has been shown to bind long fragments of DNA (>100bp) and to provide a surface around which DNA is wrapped in a positive superhelical manner. The 64-kDa fragment of GyrA, in the presence of GyrB, is capable of relaxing supercoiled DNA, but is incapable of generating negative supercoils, as native DNA gyrase is. However, a mixture of the 64-kDa and 33-kDa fragments of GyrA, in the presence of GyrB, is capable of generating negative supercoils. Thus, the unique ability of gyrase to create negative supercoils is specific to this 33-kDa C-terminal fragment of GyrA.

In this research, we are working toward obtaining a crystal structure of the C-terminal domain of GyrA. Computer modeling has predicted this domain to have a beta-propeller structure. This interesting structural framework has been observed in a handful of other proteins, such as RCC 1 and the G protein. It will be interesting to discover whether the C-terminal domain of GyrA also utilizes the beta-propeller structure. Furthermore, a crystal structure of this domain will provide important insights into the nature of gyrase’s interactions with DNA and how these interactions facilitate gyrase’s unique ability to generate negative supercoils.

Experimental

Plasmid Construction

Two different plasmid constructs containing the GyrA C-terminal domain were prepared. Plasmid pJCH33, encoding GyrA residues 571-875 (a 33-kDa fragment), was constructed in the following manner. The C-terminal domain was PCR amplified from genomic DNA extracted from Escherichia coli strain K12. Using appropriate oligonucleotides and PCR technology, an NdeI restriction site, followed by a methionine codon, a lysine codon, and six histidine codons, were introduced before nucleotide 1711 of the GyrA gene. The PCR product was then cut with NdeI and SacI and cloned into the NdeI-SacI sites of the pET-30a vector (Novagen).

Plasmid pJCH38, encoding GyrA residues 532-875 (a 38kDa fragment), was constructed in the same manner, except that the NdeI site and MKHHHHHH tag were introduced before nucleotide 1594 of the GyrA gene.

Protein Overexpression

pJCH33 and pJCH38 were overexpressed in the same manner. The construct was transformed into BL21 (DE3) pLysS competent cells (Novagen). One colony was inoculated into a 2L LB culture containing 30 μg/mL kanamycin and 20 μg/mL chloramphenicol, and grown at 37 °C until it reached an optical density (OD600) of 0.5-0.7. Protein expression was then induced by the addition of 1mM IPTG and continued 37° C shaking for four hours.

Protein Purification

The 33-kDa construct and 38-kDa construct were both purified in the following manner. Following induction, the cells were spun down and resuspended in 40mL lysis buffer (500mM NaCl, 50mM Phosphate buffer pH 7.2, 5mM imidazole, 5mM β-mercaptoethanol). The cells were then lysed using a French press. The lysate was spun down at 20,000g for 20min.
Ni\textsuperscript{2+} affinity chromatography, taking advantage of the hexahistidine tag, was used as the first stage of purification. The supernatant was incubated with 2mL Ni-NTA Agarose (Qiagen) for 45min at 4°C. The supernatant was then allowed to flow through the column and the resin was then washed twice with 10mL wash buffer (300mM NaCl, 50mM Phosphate buffer- pH 7.2, 15mM imidazole, 5mM \(\beta\)-mercapto-ethanol). The protein was then eluted in two 5mL fractions of elution buffer (300mM NaCl, 50mM Phosphate buffer- pH 7.2, 200mM imidazole, 5mM \(\beta\)-mercaptoethanol). The next stage of purification relied on heparin affinity chromatography, using a 5mL HiTrap heparin column (Amersham). The protein was loaded onto the column in the elution buffer and then washed with elution buffer with an increasing salt gradient (starting at 300mM NaCl and terminating at 2M NaCl). The protein eluted from the heparin column with a well-defined peak at 1M NaCl.

**Protein Crystallization**

Crystal screens using the 38-kDa construct have been prepared in the following manner. The purified protein was concentrated to 30 mg/mL in a Biomax 5K concentrator (Millipore). It was then diluted to a final concentration of 10 mg/mL, in crystallization buffer (650mM NaCl, 15mM Phosphate buffer- pH 7.2, 1mM EDTA, 5mM \(\beta\)-mercaptoethanol). Crystallization was achieved at room temperature using the hanging drop method, with the drop composed of 1\(\mu\)L protein solution and 1\(\mu\)L precipitant solution (5% (w/v) PEG 6000, 0.1M Tris pH 8.0) and hanging above a 1 mL well of precipitant solution.

**Results and Discussion**

We chose to make and purify two different constructs because it is currently unclear where the C-terminal domain of GyrA commences. The size of our 33-kDa construct is based upon the size of the original tryptic fragment, while our 38-kDa construct is based upon the predicted size of the beta-propeller domain\textsuperscript{4,6}. Both constructs have been overexpressed, purified, and have been used in crystal screens.

Both constructs yielded high levels of protein expression during 37°C induction. The first step of protein purification was a Ni\textsuperscript{2+} affinity column, which relies on the affinity of the introduced hexahistidine tag for binding to nickel. The Ni\textsuperscript{2+} affinity column resulted in a significant degree of purification for both the 33-kDa and the 38kDa proteins (Figure 1; Figure 2). Bradford assays (BioRad), performed after the Ni\textsuperscript{2+} affinity column, revealed that a large amount of protein had been purified: 13mg of the 33-kDa fragment and 17mg of the 38-kDa fragment.

Since successful crystallography requires a high degree of protein purity, the proteins were subjected to another round of purification using heparin affinity chromatography. Since the heparin matrix is designed to closely mirror the binding properties of DNA, the GyrA C-terminal fragments, which naturally bind to long stretches of DNA, bound to the heparin column with high affinity. High salt concentrations (up to 1M) were required to disrupt the protein’s interaction with the heparin column, which resulted in extraordinary purification (Figure 1; Figure 2). The combination of Ni\textsuperscript{2+} affinity chromatography and heparin affinity chromatography yielded protein that was pure enough to use for crystallization screens.

Crystalization of the 38-kDa protein fragment was achieved at room temperature using 5% (w/v) PEG 6000 as a precipitant. Crystal formation occurred rapidly, within one day, and produced crystals of significant size. Having found optimal conditions for growing crystals of the 38-kDa fragment, we next intend to grow crystals that incorporate heavy metal elements for improved x-ray diffraction. We anticipate the solution of a crystal structure of the GyrA C-terminus in the near future.


5 Kampranis, S.; Maxwell, A.; Conversion of DNA gyrase into a conventional type II topoisomerase. *PNAS USA* 1996, 93, 14416-14421.

6 Qui, Y.; Pei, J.; Grishin, N.; C-terminal domain of Gyrase A is predicted to have a betapropeller structure. *Proteins* 2002, 47, 258-264.


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**Summer Scholar**

*Continued from page 15*

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**Board of Directors**

**Notes of Meeting of December 12, 2002.**

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

**Officers’ Reports:**

*Chair:* M. Hoffman reported that ArQule has just announced an extensive lay-off including many chemists. He expressed concern for the members and families affected by this lay-off.

The ACS Board of Directors has announced continuation of the matching gift program for 2003, but on a 2:1 basis ($1 for every 2$ gift) M. Strem noted that the minimum gift which will be matched has been increased from $2,500 to 3,000.

The Women Chemists Committee has made funds available for women chemists in academic training, including post-docs, to attend ACS meetings.

*Secretary:* M. Singer stated that there are two Alternate Councilor vacancies for the term ending in December 2004. According to NESACS tradition to select the highest-vote runner-up, and eliminating those already elected for longer terms, Derk Wierda was nominated and elected to fill the first slot at the October Board meeting. Lawrence Scott will be nominated later under New Business to fill the second slot.

*Treasurer:* J. Piper presented the financial report for November which was ACCEPTED.

**Standing Committees:**

*Board Of Publications:* P. Gordon, by written report, stated that possible candidates for succession in the position of Editor of the *NUCLEUS* will be sought via ads in that publication. M. Chorghade is currently assisting the editor. P. Gordon stated that the vacancy in the Board of Publications has not been filled as yet. Suggestions are welcome. F. Gorga has resigned as webmaster and a new one will be sought.

The *NUCLEUS* will be approximately $10,000 under budget for 2002 because of continuing strong advertising sales. 5% increases in the remuneration of the paid staff will be sought in the 2003 budget.

P. Gordon MOVED and it was VOTED to express gratitude to F. Gorga for his efforts as webmaster of NESACS.ORG.

*Editor:* A. Heyn passed around the January 2003 proof copy of the *NUCLEUS*.

*Membership:* M. Chen reported that 435 letters had been sent to new members in October and 232 in November. Three new members will be guests at tonight’s dinner and meeting.

*Budget:* J. Piper reported that the Budget Committee is working on the 2003 budget to reduce the projected deficit.

*Public Relations:* M. Chorghade reported that he had attended an ACS training session in Dallas in November for the writing of press releases.

He will be organizing a symposium in Cambridge in April 2003 in medicinal/process chemistry, to be c-
Board of Directors
Continued from page 16

sponsored by the Mass Biotech Council and local companies. Chemistry Education: R. Tanner reported that those attending the Connections to Chemistry 2002 program will be given 1-year subscriptions to Chem Matters by the ACS. She announced that UMass Amherst will sponsor a summer program for high school teachers; a stipend will be provided.

There will be Reactions in Chemistry telecast for high school teachers, details to be announced. M. Simon MOVED and it was VOTED that copies of the NUCLEUS be given to those attending the Connections conference.

Professional Relations: M. Chorghade announced that he will be attending professional relations programs in West Virginia in February 2003 and at the UNH in January.

The guide for foreign students has been updated by the national ACS office.

Local Arrangements: P. Gordon announced that ArQule will be paying the fee for the room and AV equipment rental at the Sheraton because of the last-minute change of the meeting site from ArQule to the Sheraton at its request.

M. Hoffman inquired whether the Section could get industrial underwriting for meeting costs. M. Strem suggested that this should be considered by the Corporate Affiliates Committee.

Richards Medal: X Norris Award: P. Samuel, via written report invited nominations for this award, the deadline being April 16. The committee has chosen Bob Umans to fill the vacancy for the term ending December 2004 (to be ratified by the Board of Directors).

Esselen Award: A. Heyn reported that the Committee will be selecting the 2003 Awardee at a meeting in December.

Other Committees: Finance Committee: J. Piper reported, in writing, that the committee had made plans for future meetings. It reviewed the section’s finances, especially those of the Trust Accounts. Financial interaction with the Medicinal Group was discussed with possible recommendations for the financial interaction with NESACS. The Committee also discussed the possible transfer of funds ($50,000 had been requested) from the Permanent Trust to the Brauner Memorial Fund: to be kept on the agenda for future meetings.

Continuing Education: A. Viola reported that the November Short Course had 35 paid attendees plus 4 non-paid attendees with net proceeds of about $5,500 for NESACS. Corporate Affiliates: M. Strem reported that the committee has obtained funds in excess of the budgeted amount for 2002.

Speakers’ Bureau: S. Buta is circulating a letter to community groups, soliciting input concerning desired topics. She has received a request for a speaker on a Biotech topic.

Younger Chemists: A. Tapper, via written report, described the successful YCC social networking event on December 4, attended by about 20 younger chemists. Several students who attended were eager to join the NSCRC (Northeast Student Chemistry Research Conference). The 2003 organizing committee is to help arrange this spring event.

A. Tapper and S. Celatka are organizing an “Alternative Careers for Chemists” program, to be offered in conjunction with the NESACS February Meeting. Speakers are to be Melissa Huang, Manager of Business Development at Rhodia Chirex; Darlene Vanstone, Senior Patent Counsel at Geltex Pharmaceuticals; and Jack Cunniff, Ph.D., Regional Sales Manager for Thermo Finnigan.

YCC/JCF: M. Strem in his written report stated that the Steering Committee has selected 12 students, both undergraduate and graduate, to participate in the exchange with the German Jungchemikerforum students of the German Chemical Society (GDCh). This group was selected from a total of 29 applicants. The exchange will take U.S. participants to Munich, Dresden,

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and the German students to Boston/Cambridge. ACS President Elsa Reichmanis will be a featured speaker at a career symposium in Munich. NESACS will contribute about $10,000 for airfares and allowances for meals. Expenses in Germany will be borne by the GDCh.

Old Business: None.

New Business: M. Singer MOVED, and the Board VOTED that Lawrence Scott be elected fill the second vacancy in the roster of Alternate Councilors with terms expiring December 31, 2004.

A. Heyn MOVED and it was VOTED to approve the committee’s choice of Robert Umans to fill the vacancy for the term expiring December 2004.

M. Hoffman thanked Board members, committee members, colleagues and friends for their support during his term as Chair of NESACS.

From the minutes of M. Singer

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Historical Notes

By Edward R. Atkinson, Amherst, MA

Short biographies of recently deceased chemists and chemical engineers, continued from the February issue.

Vytautas Grubliauskas, 83, died on March 27, 2002. He was a native of Zitomir, Russia, and was raised in Lithuania. After receiving the B.S. at the Institute of Technology in Berlin, he spent the years of World War II at his home in Lithuania. He then served as an officer with the United Nations Relief and Rehabilitation Agency, with the International Refugee Organization, and as liaison with the U.S. Army European Command Headquarters. He came to the Boston area, held a teaching fellowship at Boston University, obtained an M.S. at Northeastern University and then joined Orrie Friedman’s research group at Brandeis University. In 1962, Grubliauskas became Friedman’s first employee at the newly-established Collaborative Research, Inc. (now Genome Therapeutics) in Waltham, MA. During 23 years with the company, he was director of synthetic organic chemistry research and development. Among the various areas in which he made significant contributions were pteridine chemistry, folic acid analogs, homofolic acid (20 step synthesis), phosphoramido mustards, and nucleotides (later used by Khorana in gene synthesis), virology and cancer therapy. Fluent in Russian, German, Polish and Lithuanian, he did translations and abstracts for Chemisches Zentralblatt, Beilstein, and Gmelin. Ironically, after his contributions to cancer therapy, he lost his wife of 47 years to the disease. He was survived by a daughter Irene of Brockton, MA.

It was my pleasure to have Grubliauskas as a student in my evening course in advanced organic chemistry at Northeastern University and we maintained our friendship for years thereafter.

Avrom L. Medalia, 79, died on June 20, 2002. He was a graduate of the Boston Latin School and received the A.B. from Harvard University in 1942. During 1943-1949, he was a student of I.M. Kolthoff at the University of Minnesota where he carried out work on synthetic rubber and emulsion polymerization under government sponsorship. He received the Ph.D. in analytical chemistry in 1948.

He was then employed by the Brookhaven National Laboratory (1949-1952), was associate director of sponsored research at Boston University (1952-1955), and held various positions in research and management in the areas of carbon black and new products at the Cabot Corp. (1956-1984).

During his professional life Medalia was the author of more than 80 papers and patents. Honors included the Gold Medal of the Plastics and Rubber Institute (1978), the Melvin Moony Award for Distinguished Technology from the ACS Rubber Division (1987), and the Lavoisier Medal of the Société Française de Chimie (1993).

Continued on page 19
Historical Notes

He was a member of the ACS council (1985-1990), chairman of the ACS Division of Colloid and Surface Chemistry (1983), a member of the Society of Rheology, and served on the advisory panels for the publications Chemtech, Elastomers, and Rubber Review. With his wife Judith (Klubock) he designed and crafted silver jewelry. He was survived by his wife, two sons, two daughters and their families. A memorial service for Avrom was held on June 22, 2002 at Lasell Village in Auburndale, MA where the Medalis made their home.

Henry Merken, 72, suffered a fatal heart attack on May 14, 2002, while travelling in Singapore. He was a native of Peabody, MA and a chemical engineering graduate of Northeastern University. Following U.S. Army service in the Korean War he joined Polyvinyl Chemical Industries in Wilmington, MA and subsequently founded similar companies in Holland, Mexico, and South America. He also taught polymer science at what is now the University of Massachusetts at Lowell. Full details of his professional life can be found in Chemical and Engineering News, July 8, 2002, p. 41.

G. Richard Morgan, 85, died on November 3, 2002 after an illness of several months. He was a native of Brooklyn, NY and grew up in Manchester, NH where he was a 1934 graduate of Manchester Central High School. After several years of employment by a local newspaper he came to the University of New Hampshire and obtained the B.S. (1941) and M.S. (1942) degrees in chemistry. After a year of graduate study at Purdue University he completed his work for the Ph.D. in organic chemistry at Cornell University where he was a member of a group studying high explosives. He was a post-doctoral fellow at the University of Illinois, an instructor in the chemistry department at Yale University, and then joined the technical staff of Arthur D. Little, Inc. in Cambridge in 1948. Until his retirement in 1981 his work at Arthur D. Little was in the fields of organic chemistry and the pulp and paper industry. His research and consulting practice in these fields was global in scope.

In retirement Dick Morgan was active in the alumni activities of the University of New Hampshire. He served as president of the Class of 1941, as vice-president of the UNH President’s Council, and was an ardent supporter of the UNH athletic teams. He was a supporter of the Shoals Marine Laboratory, a marine science field station operated by UNH and Cornell University. A resident of Manchester-by-the-Sea, MA since 1955, Dick served as president of the local beach and tennis club and, on many occasions, entertained family and chemist friends there.

Of interest to readers of this Note is the fact that while employed at A.D. Little, Dick served for several years as the sole secretary of the Northeastern Section and was Chairman of the Section in 1954. I first met Dick in 1940 when he was assigned to me as a senior research student. During that period and his subsequent research for the M.S. degree we published several papers and developed a lasting friendship that began one very cold night when we met at the outdoor UNH hockey rink and discovered our mutual love of the game (as observers!).

Dick was survived by his wife Julia Elizabeth Morgan, a son, a daughter, and four grandchildren. A memorial service for Dick was held at UNH on December 7, 2002.

P. Langdon Richards, 85, died on Cape Cod where he had made his home since 1974. He was a native of Northampton, MA who received the B.S. in chemistry and physics in 1937 from what is now the University of Massachusetts at Amherst.

For ten years he was employed by the precursor of what is now Exxon Mobil Corp. carrying out research on petrochemical problems. He transferred to Exxon Chemical Co. and traveled extensively in Europe and Latin America for the technical marketing division. In 1965 he became a vice-president and director of Esso Chemical U.S.A. and retired from that position in 1971 to become a consultant to the petrochemical industry. During most of his professional life, he was a resident of Westport, CT where he was an officer and member of many local organizations and town government.

In retirement he made his home in Cummaquid and was active in several clubs and associations on the Cape. Following the death of his wife Helen(Codet) he married Edith L. Lamica and was survived by her and his sons John L. of New York, Jeffrey C. of Ottawa, Ontario, Bruce T. of Barnstable, MA and Greenwich, CT and by six grandchildren and two nephews.

Robert H. Snyder, 83, died January 27, 2002 at the home of a daughter in Sudbury, MA. He was a native of Great Falls, MT who received the B.S. in chemistry at the University of Michigan in 1940.

After two years as a chemist with Hoffman-LaRoche he began 45 years employment with the U.S. Rubber Co. originally at the General Laboratories in Passaic, NJ, where he directed research in synthesis and vinyl polymerization. He also obtained the Ph.D. from the University of Chicago in 1948. He became director of materials research at the company’s tire division and remained there until retirement in 1987. During his professional years he published 56 papers and patents, was a director of the ACS Rubber Division, and was chairman of the Highway Tire Committee of the Society of Automotive Engineers. During his retirement years Snyder was active in the field of tire recycling and in 1998 published a book on the subject. He was president of Tire Technology, Inc., which he founded in 1987 in Grosse Pointe, MI where he made his home. He was survived by his wife Evelyn (Kuivnen), of Wayland, MA, three daughters and three grandchildren. A son, William, died earlier.

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Mar 10
Dr. Gordana Vunjak-Novakovic (M.I.T.; Harvard-MIT Division of Health Sciences and Technology)“Tissue Engineering - How Well Are We Doing?”
Tufts Univ. Dept of Chemical & Biological Engineering, SciTech Center, 4 Colby Street; Medford Campus, Room 136, 12:00 noon

Mar 11
Dr. Ad Bax (National Institutes of Health)“Weak alignment offers new opportunities in the NMR study of proteins and nucleic acids”MIT, Room 2-105, 4:00 pm

Mar 12
Prof. Alison Butler (Univ. Calif., Santa Barbara)Harvard/MIT Inorganic Seminar Series @ MIT MIT, Room 6-120, 4 pm

Mar 13
Susan Evans, PhD, F Acc (President, AACC)“Microfluidics technology: Lab-on-a-chip”Northeast Section, American Association for Clinical Chemistry DoubleTree Guest Suites Hotel, Waltham at 128 6 PM social; 7 PM dinner; 8 PM lecture Questions: dedrum@earthlink.net
[Note Change to Thursday]
Prof. Robert Walker (Univ. of Maryland)“Solvation at Surfaces: Profiling Interfacial Solvent Polarity with Molecular Rulers”Tufts Univ., Pearson Chemistry Building, 62 Talbot Ave., Medford, Room P106, 4:30 pm

Mar 18
Prof. Bruce Berne (Columbia Univ.)Physical Chemistry SeminarMIT, Room 2-105, 4:00 pm

Mar 19
Prof. Warren Piers (Univ. of Calgary)Inorganic Seminar SeriesMIT, Room 6-120, 4 pm

Mar 20
Dr. K. C. Nicolaou (Scripps Research Institute)BRISTOL-MYERS SQUIBB LECTURE: “The Art and Science of Total Synthesis” Boston College, Merkert 127, 4:00 pm
Prof. Jean Chmielewski (Purdue Univ.)Women in Chemistry Lecture, Bioorganic ChemistryMIT, Room 6-120, 4 pm

Mar 25
Dr. Honorine Ward (Tufts Univ.-New England Medical Center)“Carbohydrate-mediated Cryptosporidium-Host Cell Interactions”The Boston Glycobiology Discussion Group, MIT Faculty Club, 50 Memorial Drive (top floor), 6:00 pm Reservations are required; contact Kathryn Newburg 781-642-0025 kathryn.newburg@ummassmed.edu

Mar 31
Prof. Ron Breakey (Yale Univ., Dept. of Chemical, Cellular, and Developmental Biology)Biochemistry Seminar SeriesMIT, Room 6-120, 4 pm

Notices for the Nucleus Calendar should be sent to:
Dr. Donald O. Rickter, 88 Hemlock St.,
Arlington, MA 02474-2157
e-mail: rickter@rcn.com

Historical Notes
Continued from page 19

Frederick J. Stare, 91, died on April 4, 2002 at his Wellesley home. He was a native of Columbus, WI who received the B.S. and Ph.D. in chemistry at the University of Wisconsin. After two years study in Europe he obtained the M.D. degree from the University of Chicago and practiced medicine in St. Louis for one year. 

In 1941 Stare was invited by Harvard University to establish a nutrition group in the School of Public Health. His students there later established similar nutrition departments in other schools.

During his 60-year tenure at Harvard he became the leading critic of the multitude of misinformed “experts” in the nutrition field and voiced his beliefs in a nationally syndicated column, television programs (some with Dr. Elizabeth Whelan), and books. His services were sought to found nutrition programs in many foreign countries. It is said that “he moved the field of nutrition from its roots in agricultural colleges to a new base in medicine and public health”.

After retirement Stare and Whelan founded the American Council on Science and Health that contributes scientific study to public health debates.

Throughout his professional life Stare demonstrated a courageous crusader’s vitality. During the Senator McCarthy blacklisting of many professionals accused of Soviet sympathies Stare hired D. Bernard Lown who was not welcome in most of the Boston medical community. Lown subsequently won a Nobel Peace Prize for his antinuclear activities. A son-in-law, Dr. Brad Wilkinson, characterized Stare’s personality as having a feisty component. A long list of the causes he championed is included in the Boston Globe obituary notice(with portrait) on page B7 of the April 6, 2002 issue of which the above account is an abstract.

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to be continued