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NESACS

THE NUCLEUS

December 2002 *Vol. LXXXI, No. 4*

Monthly Meeting

Medicinal Chemistry Symposium on Molecular Properties and Oral Bioavailability

Book Review

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YCC Holiday Party

At Charley's Saloon, December 4

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Cover: *Sorry, the ACS Santa Claus wasn't available, so the ACS Mole with Mort Hoffman, the 2002 NESACS Chair, will have to do. (photo by M.Z. Hoffman and helper)*

Deadlines: *February, 2003 issue: December 13, 2002*
March, 2003 issue: January 17, 2003

THE NUCLEUS

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YCC News

YCC Holiday Networking Social and Toy Drive

When: Dec. 4, 2002; 6 – 9 pm

Where: Charley's Saloon at 284 Newbury St., Boston

Come celebrate the holiday season with younger chemists of the Boston area! The first 15 in attendance will receive a free drink. Appetizers will be available to all. Attendees are requested to bring an unwrapped toy which the YCC will donate to a local children's charity. For more information, please visit the YCC website at http://people.bu.edu/nsycc. ◇

NESACS News

ACS Scholars

The following 17 students are ACS Scholars in our Section:

Felipe Anziani, MIT
Pedro Arrechea, MIT
Jessica Bazick, Harvard
Elisa Calimano, MIT
Nydia Clayton, MIT
Reuben Cummings, MIT
Sharon Doku, Harvard
Michael Duncan, Dartmouth
Adan Farinas, Harvard
Christina Ann Fields, Harvard
Lauren Goins, Harvard
Daniel Golab, Harvard
Roy Hughes, Jr., Harvard
Christiana Obiaya, MIT
Keith Reed, MIT
Marlita Taylor (Nesacs Scholar), MIT
Ida Wahlquist-Ortiz, MIT

We Welcome these Scholars to our Section ◇

The NESACS website

WWW.NESACS.org

Have you looked at it?

Board of Directors

Notes of Meeting of September 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 on the Boston National ACS Meeting: The total attendance was 17,800. NESACS received Luminary Awards for Outstanding Local Section YCC Event (the trip of 9 members of the German Chemical Society's Jungchemikerforum and their academic mentors to Boston in May 2001 for a week-long participation in educational activities, including the Northeast Student Research Conference, a symposium on chemical education in the US and Germany, visits to educational institutions and a Red Sox baseball game.

The other award was to NESACS for Outstanding Performance in the Very Large Local Section category, especially for its chemistry education activities and National Chemistry Week activities. M. Hoffman also had received the comparative statistics for the Very Large Sections and noted that chief differences, in comparison with the New York and California Sections, which are the other Very Large sections, was in meeting attendance, which (correcting for a reporting error) was about half that as compared with CA and NY. He noted that items which were left blank in the annual report by NESACS which should be done: maintenance of the job manual, membership surveys, media coverage of Section activities.

M. Hoffman announced election results for 2003 positions (see the Summer issue, p.4). He also announced that the James Flack Norris Award in Physical-Organic Chemistry will be awarded at the 2003 Spring Meeting to Robert G. Bergman, University of California at Berkeley.

Chair-Elect: J. Neumeyer announced

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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. ◇

Directions

To ArQule, Inc.

19 Presidential Way, Woburn, MA

From 93 North and South:

Take Exit 37C from I-93. At the light at the end of the ramp, turn right. *Proceed approximately 0.4 miles past Genuity and the parking garage. Take the next left into ArQule, park in the area marked for Visitors. The visitor's entrance to the building is the one facing Presidential Way .

From I-95 North:

Take Exit 36 (Washington Street). At the light at the end of the ramp, take a left turn into Washington Street. At the next light, turn left into Mishawum Rd. Get into the right lane, and turn right into Commerce Way (Citizens Bank is at the corner). Stay on Commerce Way through two sets of lights. At the second set, Commerce Way becomes Presidential Way. Follow * above. ◇

Monthly Meeting

The 838th Meeting of the Northeastern Section of the American Chemical Society Jointly with the Medicinal Chemistry Group

Symposium: Factors Influencing Oral Bioavailability in Drug Design

Thursday, December 12, 2002 at ArQule, Inc.
19 Presidential Way, Woburn, MA

3:00 pm Refreshments

3:30 pm Dr. Steven C. Sutton, Pfizer Global R&D, Groton, CT

4:30 pm Dr. Stephen Johnson, Bristol-Myers Squibb, Princeton, NJ
Molecular Flexibility: A Limiting Factor for the Bioavailability of Drug Candidates?

5:30 pm Social Hour

6:30 pm Dinner

7:45 pm Evening Meeting, Dr. M.Z. Hoffman, Chair, presiding
Dr. Ronald T. Borchardt, University of Kansas, KS
The Challenges of Designing Cyclic Prodrugs of Opioid Peptides that Permeate the Intestinal Mucosa and the Blood-Brain Barrier

Dinner reservations should be made no later than noon, December 5. Please call or fax Marilou Cashman at (800) 872-2054 or e-mail at MCash0953@aol.com. Please specify: Chicken, Fish, or Vegetarian. 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, see directions on p. 4
Next Meeting: *January 9, 2003 at the M.I.T. Faculty Club, 50 Memorial Drive, Cambridge, MA. Dr.Leslie Orgel, Salk Institute, San Diego, CA:" The RNA World and the Origin of Life"*

Biographies

Steven C. Sutton is a Principal Research Investigator and Head of the Biopharmaceutics Group in the Pharmaceutical R&D Dept., Pfizer Global R&D, Groton, CT. He received a BS in Pharmacy at the Massachusetts College of Pharmacy, and a PhD in Pharmaceutical Sciences at the State University of New York at Buffalo. Prior to joining Pfizer in 1992, Dr. Sutton contributed to biopharmaceutic research programs at CIBA-Geigy (1983 –86) and at INTERx Research Labs/MSDRL (1986 – 1992). His current research interests include solving

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Abstract

The Challenges of Designing Cyclic Prodrugs of Opioid Peptides that Permeate the Intestinal Mucosa and the Blood-Brain Barrier

Ronald T. Borchardt

The delivery of the opioid peptide DADLE (H-Tyr-D-Ala-Gly-Phe-D-Leu-OH) to the brain after oral administration is challenging because of its poor permeation across the intestinal mucosa and the blood-brain barrier (BBB). In an attempt to improve the intestinal mucosa and BBB permeation of DADLE, our laboratory has synthesized cyclic prodrugs of this opioid peptide using an acyloxyalkoxy linker, a coumarinic acid linker and an oxymethyl-modified coumarinic acid linker. Unlike DADLE, these cyclic prodrugs have the physicochemical characteristics (e.g., lipophilic, uncharged) of transcellular permeants. However, when their cell permeation characteristics were determined using *in vitro* cell culture systems, these prodrugs exhibited poor transcellular permeation because of their substrate activity for efflux transporters (e.g., P-glycoprotein). These *in vitro* results suggest that these prodrugs would not be very effective in delivering DADLE to the brain after either oral or IV administration.

Mechanistic experiments using an *in situ* perfused rat ileum model and an *in situ* perfused rat brain model confirmed that permeation of the prodrugs across the intestinal mucosa and BBB were being limited by their substrate activity for efflux transporters. ◇

Biography

Ronald T. Borchardt received the Ph.D. in Medicinal Chemistry from the University of Kansas-Lawrence in 1970. After a postdoctoral year at the N.I.H at Bethesda, MD, in 1971 Dr. Borchardt joined the faculty at the University of Kansas and rose through the ranks in the Department of Biochemistry, to his current position as Solon E. Summerfield Distinguished Professor. He chaired the Department of Pharmaceutical Chemistry 1983-98.

Prof. Borchardt has received numerous awards and honors both for his teaching and research, including an Honorary Doctorate from The Royal Danish School of Pharmacy.

Professor Borchardt is the author or co-author of approximately 465 scientific publications and he has edited several books. He is the Series Editor of "Pharmaceutical Biotechnology".

His research interests are focused in the areas of drug design and drug delivery. ◇

Abstract

Molecular Flexibility: A Limiting Factor for the Oral Bioavailability of Drug Candidates?

Stephen R. Johnson

Reduced molecular flexibility and a low polar surface area are found to be important predictors of good oral bioavailability, independent of molecular weight, for a collection of 1100 discovery compounds with measured bioavailability in rats. That both the number of rotatable bonds and polar surface area tend to increase with molecular weight may in part explain the success of the molecular weight parameter in predicting oral bioavailability. The commonly applied molecular weight cutoff at 500 does not itself significantly separate compounds with poor oral bioavailability from those with acceptable values in this extensive data set. This observation suggests that compounds which meet only the two criteria of (1) 10 or fewer rotatable bonds and (2) polar surface area equal to or less than 140 $Å^2$ (or 12 or fewer H-bond donors and acceptors) will have a high probability of good oral bioavailability in the rat. To further explore this observation, data sets for the artificial membrane permeation rate, *in vivo* clearance in the rat, and metabolic stability in rat liver microsomes were also examined. Reduced polar surface area correlates better with increased permeation rate than does lipophilicity (C log P), and increased rotatable bond count has a negative effect on the permeation rate. A threshold permeation rate is a prerequisite of oral bioavailability. The relationship between the rotatable bond count and various measures of clearance are as yet unclear. ◇

Board of Directors

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the venue of meetings from October 2002 to January, 2003.

Treasurer: J. Piper presented the Treasurer's report, which was ACCEPTED.

Councilors: There was a discussion of the petitions before the council, increasing the size of Society Committees, and allocation of dues to Divisions and Local Sections. Arlene Light reported on activities of the National Employment Clearing House at the Boston Meeting, which had all the résumés and job descriptions on computer.154 employers were represented by 270 interviewers. There were 1242 job seekers for 446 jobs posted (and some others which were not posted). Increasingly, NECH operations will be by computer, thus reducing the space and staff requirements greatly, and making it possible for employers to review the résumés before the meeting.

Standing Committees:

Bd. Of Publications: F. Gorga has resigned as member of the Bd. of Publications, but will continue as Webmaster. The NUCLEUS finances are in good shape.

Editor: A. Heyn reported that 8,000 (out of the 10,000 printed) copies of the Summer Issue had been picked up by those attending the August National ACS Meeting in Boston. The remaining copies will be made available to those attending the NCW events in October.

Membership: M. Chen reported that a total of 8 new members, including one from the Maine Section, will be attending the dinner at this meeting. She also announced that one new member, Berengere Bouzou, a postdoctoral associate at M.I.T., is joining the Membership Committee.

M. Chen sent out 586 welcome letters to new members in August.

Chemistry Education: The Committee has committed $200 to the Wheaton College Clara M. Pike Undergraduate Research in Chemistry Symposium which will be held Sept. 23 at Wheaton and which is co-sponsored by

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Nominations

James Flack Norris Award For Outstanding Achievement In The Teaching Of Chemistry

Nominations are being received for the 2003 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 $3,000.

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 2002 was Dr. Zafra M. Lerman, Head of the Institute for Science Education and Science Communication at Columbia College, Chicago, IL.

Nominations for 2003 will be received until **April 16, 2003**. 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 teaching in inspiring colleagues and students toward an active life in chemistry and/or related sciences, or may attest to the influence of the nominee's other activities in chemical education, such as textbooks, journal articles, or other professional activities at the national level. Materials should be of 8 1/2 by 11 inch size but should not include books, reprints, or software.

Please direct questions about the content of a nomination to: Dr. Frederick D. Greene at fdg@mit.edu.

Nominations should be sent before ***April 16, 2003****, to:*
Ms. Marilou Cashman, NESACS, 23 Cottage St., Natick, MA 01760. ◇

Book Review

Uncle Tungsten. Memories Of A Chemical Boyhood,

by Oliver Sacks (Alfred P. Knopf, 2001) 337 pp., ISBN 0-676-97261-6; $25.00 (hardcover)

Reviewed by Dennis J. Sardella
Department of Chemistry
Merkert Chemistry Center
Boston College
Chestnut Hill, MA 02467

It is ironic that the best book I have read about the fascination of chemistry was not written by a chemist, but by a physician. *Uncle Tungsten. Memories of a Chemical Boyhood* is the product of Oliver Sacks, the neurologist who wrote *The Man Who Mistook His Wife For a Hat*, *Awakenings* and several other books. The book is an almost lyrical recollection of a childhood immersed in and consumed with chemistry. So, why wasn't *Uncle Tungsten. Memories Of A Chemical Boyhood* written by a chemist, or turning the question around, why isn't Oliver Sacks a chemist?

Uncle Tungsten tells of Sacks' discovery of, and growing absorption in, chemistry beginning in his boyhood and lasting until the beginning of adolescence, by which time his enterprise, degree of knowledge and sophistication seem to have been about what I would be happy to see in a sophomore chemistry major. He did not simply play with chemicals, he experimented, haunted natural history and mineralogical museums, read widely, and questioned, going beyond the "Gee whiz!" stage through the "Gee, why?" stage to the "Gee, then …" stage that characterizes the scientist. Growing up in post-World War II England, Sacks found in chemistry a place of retreat, pleasure and stability that nurtured the artist as well as the scientist in him.

There is a remarkable amount of descriptive chemistry in *Uncle Tungsten*, Sacks having been the beneficiary of a rather unique and accomplished family. Two parents who were physicians provided him with a privileged (and relatively unsupervised and unscheduled) childhood of the type that has almost vanished in contemporary middle-class society. His Uncle Dave (the Uncle Tungsten of the title) owned a light bulb factory and obligingly supplied Sacks with a wide variety of metals used in filaments, plus commentary on their properties), and a collection of other relatives provided him with an array of metals and pure compounds that would today bring down the wrath of both OSHA and EPA. How many youngsters have synthesized the hydrides of sulfur, selenium and tellurium, as Sacks did in his home laboratory, or held a diamond from the Kimberly Mine, or a sample of radium chloride? Uncle Abe provided him with a pocket spectroscope and a tutorial on emission and absorption spectra, while Uncle Yitzchak made his X-ray machine available. Here is Sacks, describing preparing his own colored prints during a period of fascination with photography:

> "The simplest was sepia toning – not (alas) done with cuttlefish ink, sepia, as I had hoped, but by converting the silver of the image to sepia-colored silver sulfide. One could do gold toning – this involved immersion in a solution of gold chloride, and bluish purple image, metallic gold being precipitated onto the particles of silver. And if one tried this after sulfide toning, one could get a lovely red color, an image of gold sulfide.
>
> "I soon spread from this to others forms of toning. Selenium

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Book Review

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> toning … palladium and platinum-toned prints … copper, uranium, or vanadium."

I doubt that most chemistry students have had anything like this level of access to selenium, palladium or platinum compounds, or comparable laboratory experience, short of upper-level college courses. Would Sacks have fallen in love with the romance of chemistry if Uncle Dave had only discoursed dryly about gas laws, or electron configurations, or the Nernst equation, without having been able to tie them to Sacks' own personal observations of the elements and their properties? Most chemists (at least experimentalists) are, after all, tinkerers at heart, people whose hands and brains operate best in tandem and simultaneously. I could not help recalling my own youth, when I (and many other chemists of a less enlightened generation) fell in love with the smells, color changes, flashes (and occasional booms) of chemistry while unwittingly flirting with harm.

So why is Oliver Sacks a neurologist and not a chemist? Despite his best attempt at explanation, the book ends with a puzzle: why did someone whose boyhood was so completely immersed in chemistry, who speaks so lyrically of its beauty and intricacy, seem to lose interest and move on? True, Sacks does tell us that it was always understood that he, as the child of physicians, would go into medicine, but I find it hard to accept that a person of his ability and independence of mind would have docilely given up his love in the interest of obligation. And, of course, Sacks does provide a picture of a gradual forgetfulness, rather like a mist dissipating, but perhaps the most telling observation is of the intrusion of scientific schooling:

> "I had been spoiled, in a sense, by my two uncles, and the freedom and spontaneity of my apprenticeship. Now at school, I was forced to sit in classes, to take notes and exams, to use textbooks that were flat, impersonal, deadly. What had been fun, delight, when I did it in my own way became an aversion, an ordeal, when I had to do it to order. What had been a holy subject to me, full of poetry, was being rendered prosaic, profane."

This has, an unfortunately familiar ring. Like many bright students I have seen in thirty-five years of teaching chemistry, did Sacks "vote with his feet", ultimately finding chemistry "refreshing, but not filling"? While it would be easier to understand (and accept) had he spoken glowingly of chemistry's being displaced by a growing love for medicine, there is not much evidence of this in the book (except briefly in one early chapter, then later, when Sacks mentions being deeply in the throes of love with marine biology), so we are left to wonder what motivated the shift.

Whatever the reason, it is clear that five decades away from chemistry have not dimmed his memory or affection. With his characteristically fluid writing style, Sacks clearly and compellingly recaptures the romance of chemistry, with its stinks, booms and beauty, of the people who created it, and of the masterful intellectual synthesis of fact and theory that evolved during the nineteenth and early twentieth centuries. *Uncle Tungsten* is both personal and intellectual history, and such an enjoyable and easy read that I have seriously considered encouraging my freshman chemistry students to read it. At the very least they would learn a lot about chemistry and its history, and they might even be captured by it. My hesitancy stems only from a reluctance to confront the inevitable question, "Is this going to be on the exam?" and the fear that Sacks, like a Pied Piper, will lead them through a fascination with chemistry, then out of it and into medicine. ◇

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Science, Sustainability, and the Human Prospect

Presidential Address at the February 2002 Meeting of the AAAS

*Reprinted with permission from Science, **2002**, 297, 954-958. © 2002, American Association for the Advancement of Science*

By Peter H. Raven #

When we set out the theme for the 2002 American Association for the Advancement of Science (AAAS) Meeting, "Science in a Connected World," we thought of the ways in which the fates of nations were intertwined as never before and of the role of science in shaping communication. I was mindful of the enormous challenges that faced a world that had grown so rapidly in population, individual consumption levels, and changing technologies. In the months that followed, the shock delivered by the September 11th events brought home with unimagined force the ways in which our collective neglect of these relationships had helped to bring about the dangerous and unstable state of the world in which we find ourselves. The problems we face seem cruelly compounded, but their root causes remain unchanged.

The challenges that we face are enormous and deeply rooted in relationships neglected for far too long. We must find new ways to provide for a human society that presently has outstripped the limits of global sustainability. New ways of thinking—an integrated multidimensional approach to the problems of global sustainability— have long been needed, and it is now up to us to decide whether the especially difficult challenges that we are facing today will jolt us into finding and accepting them.

The author is the director of the Missouri Botanical Garden, St.Louis, MO 63166, USA. E-mail: praven@nas.edu. This essay is adapted from his Presidential Address to the AAAS annual meeting in February 2002.

The State of the World

Over 400 generations (10,000 years), our human population has grown from several million people to approximately 6.1 billion. During this time, villages, towns, cities, and nations formed and became the homes of poets, philosophers, lawyers, builders, religious leaders, and tool makers. We continue to depend on a series of ancient, genetically and socially determined habits and attitudes, many of which seem to have been more suitable for our hunter-gatherer ancestors. We must adopt new ways of thinking that will serve our descendants well in a world that is crowded beyond imagining, a world in which we shall always be the major ecological force; unless, of course, we destroy ourselves.

During the 1790s, the global population amounted to about 800 million people. Despite. the Reverend Thomas Malthus' dire prediction that population growth would outstrip food production, we did limit the extent of starvation during the 19th and 20th centuries, in large part because of the steam engine and its successors. We manufactured increasingly toxic pesticides with which we now douse our agricultural lands at the rate of 3 million metric tons per year, worldwide. We are fixing nitrogen with an output that exceeds natural processes. Cultivated lands have grown to comprise an area about the size of South America. Rangelands occupying about a fifth of the world's land surface support 3.3 billion cattle, sheep, and goats. Two-thirds of the world's fisheries are being harvested beyond sustainability.

Over the past half century, we have lost a fifth of the world's topsoil, a fifth of its agricultural land,. and a third of its forests. Grain production has fallen short of consumption for two consecutive years, reducing the surplus to the lowest level in two decades[1]. We have changed the composition of the atmosphere profoundly, driving global temperatures upward and depleting stratospheric ozone. Habitats throughout the world have been decimated by intentionally and accidentally introduced plants and animals

Most troublesome is the irreversible loss of biodiversity. For the past 65 million years, the rate of species extinction has remained at about one species per million per year. It has now risen by approximately three orders of magnitude, to perhaps 1000 species per million per year (perhaps 0.1% of all species per year), and it continues to rise as habitats throughout the world are destroyed. Species-area relationships, taken worldwide in relation to habitat destruction, lead to projections of the loss of fully two-thirds of all species on Earth by the end of this century [2]. And these projections do not include the inevitably negative effects of climate change, widespread pollution, and the destruction caused by alien species worldwide, among other factors. In addition, the ecosystem services on which all life on Earth, including our own, depends are being disrupted locally and regionally in such away as to deprive future generations of the benefits that we enjoy now [3].

Considering the ways in which plants and animals enrich our lives, it is incredible that we continue to destroy them so carelessly [4]. The actions that we carry out over the next few decades will decide the fate of millions of species of plants, animals, fungi, and microorganisms, the greater number of them completely unknown at present and likely to have remained so at the time of their permanent disappearance from our planet.

Thus, the world has been converted in an instant of time from a wild natural one to one in which humans, one of an estimated 10 million or more species, are consuming, wasting, or diverting an estimated 45% of the total net biological productivity on land and using more than half of the renewable fresh water. The scale of changes in Earth's systems, well documented

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Science Sustainability

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from the primary literature by Pimm [5] is so different from before that we cannot predict the future, much less chart a course of action, on the basis of what has happened in the past [6].

Against this background, it is not surprising that false prophets and charlatans have arisen who, neglecting the scientific context that must underlie all wise decisions, pretend to deliver "good news" about the environment. They win fame by telling people what they want to hear. Warmed by the applause that their misstatements generate, such individuals can simply deliver falsehoods or the products of wishful thinking.

The most recent example is the work of Danish economist Bjørn Lomborg, who reprises many of the earlier misleading, if not outright delusional, conclusions offered earlier by Julian Simon and Gregg Easterbrook [7], among others. Lomborg's book, *The Skeptical Environmentalist: Measuring the Real State of the World* [8] has, remarkably, been published by the generally respected Cambridge University Press, but evidently without critical review. Although he appropriately questions some of the hyperbolic statements that environmentalists have made over the years, Lomborg largely ignores the peer-reviewed literature and frequently misrepresents the views of many of the scientists who have analyzed these areas. He blithely attacks a series of straw men that he resurrects from the past literature or simply constructs, and then repeatedly exposes his ignorance of facts and critical analyses.

Lomborg's popular success demonstrates the vulnerability of the deliberative and hypothesis-driven scientific process to misrepresentation and distortion. It is difficult to understand why a respected journal like *The Economist* would rush to his defense. Although there have been multiple excesses on both sides of this debate, at its root it is a matter of science and factual analysis, and that is the point that seems to have been lost in all the controversy that followed the book's publication. All of the world's environmental scientists cannot reasonably be classified as "dedicated greens" and their views dismissed.

The consequences of our environmental problems are severe. About a quarter of humanity survives on less than $1 per day. Depending on the criteria used, one-eighth to one-half of the world's people are malnourished. Some 14 million babies and young children under the age of four starve to death each year. In the world's poorest societies, women and children are uneducated and spend their time foraging for firewood or water. Such relationships are inevitable in a world in which 20% of us control 80% of the resources, and 80% of us have to make do with the rest.

Among the nations of the world, the role of the United States has become particularly dominant. Although we contain just 4.5% of the world's people, we control 25% of the world's wealth and produce 25 to 30% of its pollution. We are dependent on the stability and productivity of nations all over the world to maintain our level of affluence. It is remarkable, therefore, that the richest nation is the lowest per capita donor of international development assistance of any industrialized country. Only in public health do we support even the rudiments of an adequate global system.

Since publication of the report of the World Commission on Environment and Development [9], we have become accustomed to thinking of the world as a place in which everyone could eventually become rich. This may be so, but it cannot happen using the technologies we possess now and building to industrialized-world levels of consumption. Many years ago, when asked whether then-nearly independent India would follow the British pattern of development, Gandhi replied "It took Britain half the resources of the planet to achieve this prosperity. How many planets will a country like India require?" More recently, Wackernagel and Rees [10] have estimated that it would take two additional planets to support the world at the living standard of the industrialized countries, three if the population doubled, and 12 if standards of living doubled.

Science Sustainability

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The Central Role of Science and Technology

It is generally accepted that advances in science and technology power the world's economy and economic progress. In America, leading economists and government policymakers uniformly agree that the nation's extraordinary capabilities in science, technology, and health are among its strongest assets. US. investment in basic scientific, engineering, and medical research produces a rate of return of between 20 to 50% per year.

What are the specific contributions that science and engineering can make to the development of a sustainable society? Contemporary efforts to build the science of sustainability as an accessible, integrating discipline are well summarized in the National Research Council study *Our Common Journey. A Transition Toward Sustainability* [11]. Noting that many trends and conditions undermine efforts to achieve sustainability, the report concludes that an overall transition could be attained in the next two generations without the development of miraculous technologies or drastic transformations of human societies. The report stressed, however, that significant advances in basic knowledge, in the social capacity and technological ability to use it, and in the political will to turn this knowledge into action will be necessary to achieve this transition.

Those who find comfort in the soothing words of Lomborg might wish to read what a panel of distinguished environmental scientists (people actually working in the area and knowledgeable about it) concluded from 3 years of study of the pertinent facts and have presented in this report, before they completely relax their focus on the world as it really is.

Energy is particularly important for global sustainability. The potential savings from energy conservation and from the development and adoption of alternative sources of energy are well understood and massive. As to alternative sources of energy, Lester Brown cogently points out in his new book *Eco-Economy* [1] that a combination of wind turbines, solar cells, hydrogen generators, and fuel cell engines offers both energy independence and an alternative to the fossil fuels that are driving global warming. Worldwide and over the past decade, the use of wind power grew by 25% a year, solar cells at 20% a year, and geothermal energy at 4% a year. During the same period, oil consumption grew by 1% a year, while coal consumption declined by a similar amount. Natural gas grew by 2% annually.

Unfortunately for the United States, most of the growth in alternative energy use has taken place abroad. In 2001, the United States consumed an average of 19.6 million barrels of oil per day. Our total oil imports were 11.6 million barrels per day, or 59% of consumption. Of the imported oil, 2.73 million barrels per day (or 23.5% of total imports) came from the Persian Gulf. According to the Cato Institute [12], America spends at least $30 billion to $60 billion per year and deploys thousands of military personnel in securing Persian Gulf oil, for which we pay approximately $21.4 billion [13]. Against this background, it seems astonishing that we would consider drilling for oil in the Arctic National Wildlife Refuge, which at peak production would provide barely 5% of our national needs. At the same time, we do not sufficiently encourage inventiveness in developing and marketing sustainable energy sources.

The challenges of the 21st century, owing principally to the combined impacts of the globalization of markets and technology-driven knowledge as well as the information explosion, demand increased attention to the development of educational systems both for the United States and for the world at large. Scientific understanding is no longer only a desirable good but clearly an imperative for building truly representative democracies. The involvement of scientists in an effective information network leading to an improvement of the educational system and in promoting public understanding of science would help greatly in building strong sustainable societies [14]. Such efforts will help informed citizens to make better decisions and will ultimately lead to increasing the financial support for the scientific enterprise. The AAAS has been a leader in increasing public understanding of science and in formal science education, and we continue to stress these fundamentally significant fields in the future.

Achieving a Sustainable World

In light of all this, one is compelled to wonder whether the current model for international institutions, established in the wake of World War II, is adequate for building a sustainable world. It is telling that the organizers of the Rio Summit failed to persuade the United States, Japan, or any other country to provide the funds necessary to redress the global imbalances.

Scientist-to-scientist cooperation between those in industrialized nations and their colleagues in developing countries is important for achieving effective global communication and, ultimately, sustainability. Or, as the late Congressman George Brown said to the National Academy of Sciences in 1993:

> "This work must begin first by viewing developing nations as partners instead of as step-children ... Of all the many ways in which we can cooperate for the common good, the case for science and technology cooperation with science-poorer nations is perhaps the most compelling. To do so, we must abandon the instinct to judge others by their past accomplishments, or to judge our own accomplishments as the proper path for others."

The problem of transferring technologies to and building capacities in countries throughout the world in such a way that they can contribute adequately to sustainable development is a difficult one, but one that we must confront fully [15]. Ismail Serageldin [16] has presented an argument for the cooperative development of science throughout the world that is both moving and

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compelling, stressing also the role of the scientific attitude in bringing people together on a rational basis.

Many of us look forward with trepidation to the World Summit on Sustainable Development in Johannesburg, South Africa, to be held this September, because the continued deterioration of the environment over the past 10 years has been so obvious and the signs of progress so limited. Nonetheless, there have been some outstanding efforts to refocus and renew commitments there [17]. There also is growing evidence that corporations are increasingly realizing that understanding and working with the conditions of sustainable development are necessary prerequisites for success in the corporate world of the future [18]. John Browne, chief executive officer of BP-Amoco, for example, set his company on a course that will embrace alternative energy sources and energy conservation, reasoning that in the face of global warming, they must do this if they are to continue to be a profitable energy company in the future.

The kind of grassroots activities that are promoting sustainability on a local scale have become a powerful force throughout the world. Perhaps they are, fundamentally, only a reemphasis of what has been traditional. Whether establishing local clinics and sustainable industries in the Biligiri Rangan Hills of southern India, building people-based ecotourism centers on native lands in Kenya, rebuilding a broken landscape at the Bookmark Biosphere Reserve in South Australia, learning how to ranch sustainably on the vast grasslands of the Malpai Borderlands of New Mexico and Arizona, or simply rooting out alien plants on Albany Hill in the San Francisco Bay Area, the people who are pursuing sustainability in a direct and personal way will hugely affect the shape of the world in the future.

Within a few years, a majority of the world's people will, for the first time, be living in cities [19]. In order to build a sustainable world for the future, it will be necessary first to develop better models for cities, taking into account the multidimensional contributions of science and engineering, politics and social sciences, and many other fields for designing the improved cities of the future. On the other hand, it will be necessary to pay increasing attention to the rights and needs of rural dwellers throughout the world and to fund ways to give them access to the information that they so obviously require. Activities such as those of the M. S. Swaminathan Research Institute in Chennai, India, in bringing health and agricultural information at low cost to the villages around Pondicherry will need to be multiplied many times over for success.

A Vision for the Future

On 6 January 1941, President Franklin Delano Roosevelt, addressing Congress on behalf of a nation that was moving inexorably toward full participation in World War II, said,

> ". . . we look forward to a world founded upon four essential human freedoms. The first is freedom of speech and expression everywhere in the world The second is freedom of every person to worship God in his own way—everywhere in the world. The third is freedom from want, which, translated into world terms, means economic understandings which will secure to every nation a healthy peacetime life for its inhabitants—everywhere in the world. The fourth is freedom from fear, which, translated into world terms, means a world-wide reduction of armaments to such a point and in such a thorough fashion that no nation will be in a position to commit an act of physical aggression against any neighbor—anywhere in the world That is no vision of a distant millennium, it is a definite basis for a world attainable in our own time and generation ... Freedom means the supremacy of human rights everywhere."

When the end of the war was in sight, farsighted people took the first steps in the construction of the institutions that they thought would help to build the kind of world that Roosevelt had envisioned. They believed that global institutions such as the United

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Nations, the World Bank, and the International Monetary Fund would serve the world well, as indeed they have. None of our national leaders could have imagined withholding support from these institutions because of a perceived lack of control over their activities. Instead, the nations of the world recognized themselves as a community in which all people should ultimately be able to enjoy the kinds of specific rights embodied in Roosevelt's Four Freedoms. Where have these dreams gone?

For reasons that are starkly obvious, we are now focusing our attention on terrorism and the problems associated with it. As the months go by, the real challenge facing us, however, will be whether we will come to regard the events of September 11 as specific and short-term or will analyze their underlying causes and learn how to deal with those causes. We must learn to deal justly with people around the world if our own hopes and aspirations are to be realized. Despite the Lomborgs, *Economists*, and *Wall Street Journals* of the world, simply appropriating as much as possible of the world's goods and processing them as efficiently as possible can never be a recipe for long-term success.

The United States is a small part of a very large, poor, and rapidly changing world, and we, along with everyone else, must do a much better job. Sustainability science has a good deal to say about how we can logically approach the challenges that await us, but the social dimensions of our relationships are also of fundamental importance. Globalization appears to have become an irresistible force, but we must make it participatory and humane to alleviate the suffering of the world's poorest people and the effective disenfranchisement of many of its nations. As many have stated in the context of the current world situation, the best defense against terrorism is an educated people. Education, which promises to each individual the opportunity to express their individual talents fully, is fundamental to building a peaceful world.

In reality, the only way to build a secure world is to change both that world and our way of thinking about it. Obviously, there are many steps that we can and should take now, such as better surveillance, better detective methods, hardened infrastructure, improved methods for protecting data, a better understanding of people living in different situations, and more secure ways of dealing with nuclear materials. But we also must address the need for constant supplies of renewable energy and reduce our dependence on both foreign and domestic sources of oil, coal, and natural gas, putting high priorities on both energy conservation and alternative sources of energy. The technology to accomplish this is available, and the economic and security advantages that would accrue to the nation are enormous.

Some General Principles

We have the extraordinary privilege in the United States of living in a democracy, a system developed over the more than two centuries of our history and based on individual expression and participation. But effective participation involves access to an appropriate level of education, as well as widespread active involvement in the political process.

In a democracy, governmental processes must be transparent to all, participatory, and subject to review and improvement. People must have confidence in their government. The mishandling of the epidemic of mad cow disease in the United Kingdom provides a vivid example of what happens to that confidence when inappropriate advice is given by governmental agencies.

Civil liberties are fundamental, precious, and not to be sacrificed, however briefly, for any but the most urgent reasons. Pressures on civil liberties will increase as the world population swells and demands for enhanced consumption grow. In the face of these pressures, we need to be vigilant to protect what we consider the most important.

Accepting, even embracing, diversity must become a cornerstone of society. It is against our common interests that hundreds of millions of women and children, living in extreme poverty, are unable make the best use of their abilities. Such discrimination, whether we focus on it or not, is morally abhorrent.

Clearly, a small minority of Earth's residents cannot continue to consume such a large majority of its productivity. As Ismail Serageldin [16] has put it, "…a world divided cannot stand; humanity cannot survive partly rich and mostly poor." Population, overconsumption [20], and the use of appropriate technology must all be brought into the equation to achieve a sustainable world. Nothing less than a new industrial revolution [21] and a new agriculture [22] are required to make that world possible. The task is daunting, but it is one we must undertake. The basic conditions for change must come from within us: We need new ways of thinking about our place in the world and the ways in which we relate to natural systems in order to be able to develop a sustainable word for our children and grandchildren [22].

Think about our relationship with Afghanistan and Pakistan. Once the Russians left Afghanistan, we left. It was a clear demonstration of our lack of fundamental interest in the people of the region, and we all know the consequences. Although the events that followed have certainly not all been clear examples of cause and effect, there is a relationship. In the context of this global reality, how many collaborate with a scientist working in an Islamic country, and how many are making the effort to nurture science there? We need to work together to overcome the malign effects of the September 11 events, which have put on hold efforts by scientists in Islamic nations to strengthen ties among themselves and with the West, and we should reserve resources to make sure that that effort succeeds [23]. We also must see the estimated 6 million Muslim U.S. residents, with their unique contributions to our society, as a bridge to the vast Islamic

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world that we understand so poorly.

Think about India and the state of science and technology in that vast country. What do we really know about India, and how are we working to improve our relationships with the world's largest democracy? One-sixth of the world's people live in India, constituting a major economic and environmental force. But what does the average American really know about India? How much does he or she really appreciate what India has to offer, or try to understand its people in a psychological sense; socially; politically; in terms of its art, its writers, its history, its scientists, and all of the other components that make up that great nation? Would it not be in our common interest to engage much more fully, to understand, to work to build communication? Can we, in fact, hope to build a sustainable world without such engagement?

Then think about Africa. We know that many of its people are dying of AIDS; we know that many of them are starving; we have heard of merciless dictators, of bloody civil wars, of the slaughter of magnificent large animals. Many of us have learned to appreciate 19th-century African art, but do we know what Africans are thinking about now? About their dreams and hopes; their literary, musical, and artistic traditions; their efforts to achieve democracy throughout the continent? Are we working with African scientists to help them develop advanced scientific and technical skills that they could use to improve their lot, the sustainability of their lands, and their contribution to global sustainability?

Many of the world's life-support systems are deteriorating rapidly and visibly, and it is clear that in the future our planet will be less diverse, less resilient, and less interesting than it is now. In the face of these trends, the most important truth is that the actual dimensions of that world will depend on what we do with our many institutions and with the spiritual dimensions of our own dedication. In the words of Gandhi, "The world provides enough to satisfy everyman's need, but not enough for everyman's greed."

At the AAAS, we must be dedicated to expanding our global leadership role on behalf of science and society. In our connected world, both the associations between the disciplines that are symbolized by our fellowship and the global connections are of extraordinary significance.

If the United States can become more international, if we can all learn to deal with the conditions of the world as they really are, much more closely than we have done before, we can begin to think about the contours of the sort of world that we want to build for the future. To the extent that we do that, the operations of our individual institutions will be successful, and we will be making a worthy contribution to the kind of a world where our grandchildren would like to live. Being optimistic about the future by wearing rose-colored glasses and engaging in wishful thinking in a moral vacuum constitutes a crime against our posterity, being optimistic because of a determination on the part of each to contribute what he or she can to make the world a better place is, in the words of Kai Lee [24], engaging in a "search for a life good enough to warrant our comforts." As scientists, we should understand this, and we must contribute what we can to improve the world and to learn to respect one another. I am confident that we will do this and determine that the AAAS will help in important ways in achieving this all-important goal.

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Member News

Stephen J. Lippard has been awarded the *Fred Basolo Award* co-sponsored by Northwestern University and the Chicago Section, ACS. Dr. Lippard, who is the Arthur Ames Noyes Professor of Chemistry at M.I.T., has delivered the award address at the Chicago Section's October 18 meeting. Dr. Lippard was being recognized for the research which he described in the Richards Medal Award Address in our Section, March 14, 2002: Bioinorganic chemistry – specifically the role of metal-organic compounds, such as cisplatin, in cancer treatment.

C&E News, **2002,** *80* (Sept. 30), 51. ◇

Green Chemistry

Presidential Green Chemistry Challenge Awards Program

The program was established to recognize and promote fundamental and innovative chemical methods for pollution prevention and are widely industrially applicable. Green chemistry includes all aspects or types of chemical processes: synthesis, catalysis, analysis, monitoring, separations and reaction conditions which reduce environmental or human impact.

The Awards program is open to all individuals, groups and organizations, including academia, government, or industry

The deadline for receipt of applications for the 2003 Awards is December 31, 2002. For application forms or information, contact:ppic@epa.gov, engler.richard@epa.gov, or call Richard Engler at 202-564-8740 ◇

Biographies

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oral absorption limitations of drug candidates, physiologic/ pharmacokinetic computer modeling, and IVIVC.

Dr. Sutton has authored or co-authored over 70 articles, book chapters, abstracts of work in progress, invited presentations and patents.

Stephen Johnson received the B.S. in chemistry from the University of Delaware in 1994. He received the Ph.D. in chemistry in 1998 from Pennsylvania State University after studying under the guidance of Professor Peter C. Jurs.

Dr. Johnson is a Senior Research Investigator at the Bristol-Myers Squibb Pharmaceutical Research Institute in Princeton, NJ where he is responsible for the development and validation of models for predictive ADMET. Previously, he was a member of the Cheminformatics Department at GlaxoSmithKline in Philadelphia, PA in the Knowledge Discovery group. ◇

Board of Directors

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NESACS. Summer Research interns and coop students will make presentations.

The Committee also committed $250 to Bridgewater State College for its Environmental Research Symposium on November 16, 2002 at Bridgewater State College. Students from the Northeast have been invited to present posters on their environmental research projects.

The 8th annual Northeast Regional Undergraduate Day, sponsored by the Committee, will be held November 2, 2002 at B.U. as part of the NCW activities.

Dr. Anthony Fernandez of Merrimack College has agreed to to serve on the Chemistry Education Committee as the Student Affiliate Coordinator.

NESACS has been invited to present a workshop at the Sally Ride Science Festival at M.I.T. on September 22. This event is for middle-school girls. Doris Lewis of Suffolk University will assist him at the workshop.

S. Lantos reported on the very successful High School Day Program at the Boston National ACS Meeting and he thanked the Section for approving $1,000 for this event. He also reported on the Chemistry Olympiad in the Netherlands. The US students received one silver and one gold medal, with the silver medal being awarded to Colin Whittaker from this Section. In addition, of the 20 participants in the Chemistry Olympiad USA Summer workshop, 3 were NESACS students, and one (Whittaker) was chosen to be one of the 4 representatives from the US.

Hill Award: M. Hoffman reported for M. Dube that the 2002 award will be presented to Michael Hearn at the October Meeting.

Norris Award: P. Samuel reported in writing that the 2002 Award will be presented to Prof. Zafra Lerman (Columbia College in Chicago) at the November 7 (note this is the FIRST Thursday) NESACS meeting. She is Director of Science Education at the college which offers degrees in fine arts and, journalism. At the Award Meeting she will demonstrate with some of her students how to communicate scientific ideas by the media of music and dance.

Professional Relations:

Career Services: M. Chorghade reported in writing that the Job Search, Résumé Writing workshop program is proceeding well. M. Chorghade gave talks repeatedly at the Career Services Pavilion at the Boston National ACS Meeting in August. A new workshop "Finding Jobs in the Biotechnology Sector" has been added and was well attended. M. Chorghade organized a panel discussion on "Overcoming Cultural and Linguistic Barriers in the Workplace," that was well attended and resulted in a lively discussion. The résumé review and mock interview program is very popular, and it has been suggested to add this feature to our Section meetings.

M. Chorghade will be the guest speaker at a workshop "Conducting a Job Search" at Virginia State University, Blacksburg, VA on September 13.

Public Relations: M. Chorghade reported that he attended a special training workshop for PR chairs at the Boston National ACS meeting.

Other Committees:

Continuing Education: A. Viola reported that at the National ACS Meeting in Boston, a full slate of Short Courses had been listed, but several had to be canceled because of low participation. However, one course: *The Organic Chemistry of Drug Design and Drug Action* had over 60 enrollees, with only 10 being from the Northeast. Therefore it was suggested that NESACS offer this course in the fall. The course will be given November 20-21. at Northeastern University.

Northeast Regional Meeting (NERM): H. Mayne reported that the 2003 NERM will be hosted by the Eastern New York Section, to meet June 15-18 in Saratoga Springs, NY; NERM 2004 will be hosted by the Rochester Section, to meet October 31-November 3, 2004 in Rochester, NY. NERM 2005 will be hosted by the Western Connecticut Section, to meet at Sacred Heart University (date to be announced).

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NERM 2001 at Durham, NH had a positive balance of about $10,000 which will be distributed to the several Sections participating.

It was suggested to use the NESACS share of money received from NERM 2001 to sponsor students and teachers to attend future NERM meetings. It was suggested that future NERM meetings be advertised in the NUCLEUS and on our website. "The NUCLEUS, in the past, has included such NERM materials as were available to it, usually including the list of invited speakers, and of symposia, in addition to registration information; ed."

Natl. Chemistry Week: D. Lewis, reporting for S. Iacobucci, stated that the chief event will be the Phyllis A. Brauner Memorial Lecture at the Museum of Science, to be given by Dr. Bassam Shakhashiri on Sunday October 20, to be repeated to inner city school students on Monday, October 21. Arrangements for busing children to this event are under way. D. Lewis asked for volunteers to help at the museum.

The 2002 theme is "Keeping Us Clean." which will be combined with the current theme at the museum: Ancient Egypt.

Phyllis A. Brauner Memorial Lecture Committee: D. Lewis presented an extensive report of the meetings of the committee. Fundraising is under way toward a $150,000 goal. Large contributions ($2,500 or more) may be matched by the ACS National Chemistry Week Foundation. The fund will be placed with the national ACS, but proceeds earmarked for the Brauner Memorial Lectures, as directed by NESACS.

Summerthing: M. Hoffman reported for W. Gleekman that for the May 22 Red Sox game 300 tickets had been ordered and sold, for the July 25 game 230 tickets had been ordered and sold, for the game during the National Meeting, 400 tickets had been ordered and sold. The June 9 visit of the

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Pictures from Meetings

(Photos by M.Z. Hoffman)

National ACS Meeting, Boston, MA, August 18-22, 2002

The Student Affiliate Chapter at Bridgewater State College which hosted the Undergraduate Social. Faculty advisors Ed Brush (front right), Frank Gorga (back, second from right)

Connections to Chemistry, Burlington, MA High School October 9, 2002

Carl M. Selavka, Director, Mass. State Police Crime Laboratory presenting his keynote address: Don't Get Your Genes in a Bunch

NESACS Meeting at Henderson House, October 10, 2002

Henry A. Hill Award Group (l. to r.): M. Dube (Award Committee, chair), Michael J. Hearn (Henry A. Hill Awardee), Jean A. Fuller-Stanley (NESACS Chair-elect designate)

Esther A.H. Hopkins (center) receiving the Award for Recognition of 30- years of dedicated service to the Northeastern Section, flanked by Anne O'Brien (left) Director of District I and speaker at the meeting, and by Morton Z. Hoffman (right) NESACS Chair.

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Check the NESACS Homepage for late additions: http://www.NESACS.org

Note also the Chemistry Department Web pages for driving directions and updates. For example:
http://web.mit.edu/chemistry/
http://www-chem.harvard.edu/events/
http://www.umassd.edu
http://www.dartmouth.edu/~chem/

Dec 2

Prof. David Wales (Univ. of Cambridge)
"Taking a Walk on an Energy Landscape"
Joint Harvard-BU-MIT-- Theoretical Chemistry Lecture Series
MIT, 77 Massachusetts Avenue, Cambridge, Rm 31-161, 3:00 pm

Prof. Joseph Jarrett (Univ. of Pennsylvania)
TBA (Biochemistry)
MIT, Room 6-120, 4 pm

Dec 3

Prof. Scott Auerbach (UMass Amherst)
TBA (Physical Chemistry Seminar)
Brandeis University, Gerstenzang 122, 4:00 pm

Ms. Nicole Lee (UMass Boston graduate student)
Literature seminar
UMass Boston, Science Building (S-1-089), 4:30 pm

Hua Zho (UNH)
TBA (Organic)
UNH, Room L103, 11:10 am

Dec 5

Prof. Nancy Gordon (Univ. of Southern Maine)
"Unpredictable Kinetics: The reaction of $[Co(NH_3)_5H_2O]^{3+}$ with cysteine and glutathione"
UNH, Room L103, 11:10 am

Dec 9

Prof. Shana Kelley (Boston College)
"Novel Peptidointercalators as Nucleic Acid Probes"
Boston Univ., Metcalf Science and Engineering Center, 590 Commonwealth Ave., Boston, Science Center Auditorium, SCI/107, 4 pm

Prof. John Gross (Harvard Univ.)
TBA (Biochemistry)
MIT, Room 6-120, 4 pm

Dec 10

Weimin Lin
TBA
UNH, Room L103, 11:10 am

Dec 11

Prof. George McLendon (Princeton Univ.)
TBA (Inorganic Chemistry)
MIT, Room 6-120, 4 pm

Prof. Scott Miller (Boston College)
"Discovery of Minimal Peptide Catalysts for Asymmetric Synthesis"
U Mass Dartmouth,Group II, Room 115 Science and Engineering Building, 4 pm

Dec 16

Prof. Benjamin List (The Scripps Institute)
"Asymmetric Aminocatalysis"
Harvard Univ., Pfizer Lecture Hall, 4:15 pm

Michael Yaffe (MIT Biology)
TBA (Biochemistry)
MIT, Room 6-120, 4 pm

Dec 18

Daniel Kramer (MIT, Davison Research Group)
TBA (Inorganic Chemistry)
MIT, 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

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Saugus Iron Works reconstruction was attended by 6 members and a spouse and child.

Younger Chemists: Application for the 2003 exchange program with the German GDCh Jungchemikerforum are being accepted. The locations will be Munich and Dresden, Feb. 23-Mar.1.

A National YCC Leadership Development Workshop that was held at the West Central and Southeast Regional Meetings (1-2 day seminars), was attended by A. Tapper who received a National ACS Award for her YCC leadership activities. She also was a speaker at a Career Workshop at the Interregional Symposium on Material Sciences and Life Sciences.

New Business: M. Hoffman recommended that a Finance Committee be created as a Special Committee to provide an ongoing timely review of the financial health of the Section. Members are to include the Budget Committee, as well as a NESACS member who is not currently on the Board of Directors. The committee is to meet four times a year and would make its recommendations to the Board of Directors.

No Bylaws amendments are required for setting up special committees.

J. Neumeyer MOVED and H. Brown SECONDED that it be the Sense of the Board to establish a Finance Committee, as described in the Minutes. PASSED. ◇

The NESACS website

WWW.NESACS.org

Have you looked at it?