

THE VORTEX

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CALIFORNIA SECTION
DECEMBER 2015



Attila Pavlath, 2016 recipient of the Mosher Award (see Page 4)

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Tentative Monthly Section Programs 2016

There are no Section program meetings scheduled for December. The following list are some of the meetings that are being planned. Arranging meeting places and coordinating with the speakers' schedules is always a challenge. Please feel free to recommend topics and speakers.

February--Susan Altenbach, USDA, —Wheat allergies

March--Xiaoxi Wei, PhD, X-Therma, Inc. A young company located in the Bay Area with the mission to develop potent biomaterials for both medical and industrial applications via Biomimetic Nanoscience.

April—Justin Siegel, U Washington —Startups

May--Jyllian Kemsley, Ph.D, C&E News Editor, Laboratory Safety
Bay Area and Chico

May—Awards Luncheon

Other potential Meetings

Torey Arvik, Sonomaceuticals, LLC. Obesity, inflammation and grape seed prebiotics
Ruihong Zhang, UC Davis, Recycling waste for energy self sufficiency

Call for Volunteers

CalACS has ambitious and challenging programs and activities planned for 2016 and could use your help in all areas; but key areas are:

Assistant Editor for the Vortex: The present editor will be the Section's Chair for 2016 and needs help with the newsletter and website, together or separately. The Editor will arrange for training, if necessary. Plan on helping for at least 6 months or more and possibly becoming the Editor. The duties are to help lay out the monthly newsletter and update the website. No knowledge of html or programming language is necessary for the website maintenance and updating. The newsletter uses the Adobe In Design desktop publishing and some working knowledge is important.

Chair, co-chair or member of the Program Committee: Members on this committee will make and/or coordinate the arrangements for the Monthly Technical meetings.

Chair, co-chair or member of the new Communication Committee. Members on this committee will develop improved communications strategies to engage and inform members or section activities using the website, The Vortex, Social Media, and other communication methods.

Chair, co-chair, or member of the new Welcome Committee: Members in this committee will develop and implement strategies and tactics to make sure new members are appropriately welcomed and informed of the Section's activities and benefits. This committee will also be charged with developing programs that turn more members into active members. Send an email to Lou Rigali at lr101898@aol.com or call 510 868 8788.



Happy Holidays and a Happy New Year

Best wishes to all this
Holiday Season from the Executive Committee
and *The Vortex Staff*

THE VORTEX

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Chair's Message

Charles Gluchowski



Hello all, greetings and welcome to the last Vortex of 2015. I hope that as the year winds down that everyone has a great holiday season.

We have been busy with activities that will

slow a bit in December but will pick up again in January. The Western Regional Meeting was held at CSU San Marcos from November 6-7 with major efforts for that event coordinated by Lee Latimer. That was a busy CALACS weekend with the WCC having its Fall Meeting on November 7 covering the topic of "Tax Strategy" presented by Laurie Craise and held at the Chevron Research Technology Center. In addition, November 7 was also the date for the Bay Area Science Festival Discovery Days event at AT&T Park. We had a wonderful team of students and CALACS members were constantly busy educating children and adults on the wonders of plant aroma chemistry. We continued our outreach on November 19 with another successful Family Science Night at Bancroft Middle School in San Leandro. Kudos to Alex Madonik for continuing to develop strong outreach programs for our local community. Last but not least, our November 12 section meeting "Thorium Nuclear Fuel: Benefits

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and Challenges" was presented by Dr. Max Fratoni and stimulated quite a bit of discussion. This meeting was also held at the Chevron Research Technology Center and was organized by Igor Sobolev.

In November both CALACS and the National ACS held elections. We are delighted to have Jim Postma return as Chair-Elect for the section, Attila Pavlath return as Director and Eileen Nottoli return as Councillor. In addition we are also delighted to welcome our new Treasurer, Paul Vartanian, Members-at-large: Greti Sequin, Liam Berryman and Dan Calef as well as new Councillor Stephanie Malone and Alternate Councillor Patrick Lee. In addition, Lee Latimer was elected to the ACS Board of Directors as a Member-at-Large. Unfortunately, CALACS member Bryan Balazs who was a candidate for ACS President did not get elected this year. I believe that Bryan was an exceptional candidate and what will be the national organization's loss is a gain for CALACS as he will continue to contribute greatly to the section moving forward. We continue to have a strong and dedicated leadership team that will continue a strong presence for CALACS at the local and national levels for years to come. Please join me in congratulating all of our candidates and newly elected members!

One bit of unfortunate news as I write this

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THE VORTEX

Mosher Award 2016 Recipient Attila Pavlath

This award was established in 1980 by the Santa Clara Valley Section (SCVACS) to:

1. recognize and encourage outstanding work in chemistry,
2. advance chemistry as a profession, and
3. recognize service to ACS.

The award is named for the late Dr. Harry S. Mosher of Stanford University, Palo Alto, California, and Carol W. Mosher of the Stanford Research Institute International, Menlo Park, California, husband and wife, charter members and long-time supporters of SCVACS. The award currently consists of an engraved plaque and a check for \$2000.

The California Section is pleased to participate in the event and honor a long time Member and Past Chair x3 of our Section and past President of the ACS.

Place: Basque Cultural Center, 599 Railroad Avenue, South San Francisco, CA

Date: Thursday January 21, 6-9 pm, Social at 6:00, Dinner at 7:00 and the Presentation & Mosher Talk "Does the public realize what chemistry has done for them?"

Attila E. Pavlath, ACS President 2001

Reservations are required: RSVP no later than Wednesday, January 13, 2016 to Julie Mason at California Section Office by email at office@calacs.org or phone 510-351-9922. Please pay in advance by sending a check made payable to California Section, ACS, to 2950 Merced Street, #225, San Leandro, CA 94577 or thru PayPal and using our email address.

Biography:

Attila Pavlath was born in 1930 in Budapest and received all his education there. In Hungary he was an Assistant Professor at the Technical University of Budapest. He was the co-founder of fluorine chemistry in Hungary. In 1956, after the Hungarian Revolution he escaped Hungary together with his family. After two years at the McGill University in Montreal, Canada he joined Stauffer Chemical Company in Richmond California to lead a research group on agriculture related problems. In 1967, on the invitation of the U.S. Department of Agriculture, he continued his research at the Western Regional Research Center, in Albany, California where he headed various research projects. He is still doing research there as a senior emeritus scientist.

In his 60+ years of teaching and research career Dr. Pavlath pioneered research not just in fluorine chemistry, but also in areas of glow discharge, biomass, biodegradable films and various agricultural chemistry problems. He has published more than 130 research papers and written 10 books and even more book chapters. He has been awarded 25 patents and has been invited to lecture internationally. In 1997 he was awarded by the Pioneer of the Year Award by the American Institute of Chemist and

in 2004 he was elected to the Hungarian Academy of Science in 2013. He received the Kenneth Spencer Award in 2013 for outstanding achievements for food and agricultural chemistry,

In addition to his internationally known scientific research, he is also very well known in the American Chemical Society for his continual activities to modernize the Society and to improve the public image of chemistry worldwide. In 1999 the members elected him as President and he is still very active in these areas.

In everyday life, we enjoy the benefits of chemistry 24 hours a day in every daily activity, *i.e.* health, transportation, entertainment, cooking, dressing, just to name a few. The public take them for granted to be there when they use them and rarely think about how it was made possible. In a similar way as above, when something goes wrong, *i.e.* the car does not start or medication has a side effect, they are quick to blame the problem on whatever or whoever made them available for our everyday life. They are quickly influenced by the media on the malfunctions of, or possible harms caused by these developments, ignoring their successful use 99% of the time in our lives.

Is this human nature or the lack

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*Tax Strategy, by Laurie Craise,
EA, H&R Block*

WCC Meeting Summary, of event on 11/7/15 at Chevron's Richmond Technology Center

Our meeting was hosted by Sandi Tillin and Toni Miao, who brought delightful goodies we enjoyed during the gathering that preceded our presentation on Tax Strategy by Laurie Craise.

Laurie has been working in tax preparation for over 30 years, and is an Enrolled Agent, having earned the highest credential awarded by the IRS. This credential requires successful completion of a qualifying exam, as well as continuing education in tax law (72 hours of coursework every three years). Her interest in learning about tax preparation originated from when she was subjected to an IRS audit of a personal tax return that a CPA had prepared for her.

She prepared remarks on five topics, concentrating on Federal tax law and implications, as she said she could easily have presented a talk of similar length on

state taxes. The five topics are:

- Retirement planning,
- Simple things sometimes overlooked that can reduce taxable income,
- Tax issues particularly pertinent to women, concerning child and elder care,
- Maximizing employee benefits, and
- Issues to consider before starting a business.

Laurie shared many useful facts for the audience to consider on each topic. Rather than skim over just a few of them, instead I recommend that you take advantage of reviewing the slide deck that Laurie prepared for her presentation, which she has generously shared with us. Julie at the section office will be able to forward the slides to you, if you are interested in having them. She has included a list of resources that are readily available to the public from which one can find answers to specific questions any of us might have.

During the luncheon that followed, Laurie was open and accommodating to any and all questions from audience members.

S.W. Yeh, Co-Chair WCC



Some of the visitors to the CalACS booth for the Bay Area Science Festival Discovery Days event at AT&T Park on November 7.



Toxic Terra (Part 4)

Bill Motzer

In Part 1 of this series (September 2014 Vortex), I derived a simple classification of naturally occurring hazardous substances (NOHS). In part 2 (February 2015 Vortex), I discussed the crustal and environmental distribution of arsenic including its speciation, relative toxicity, and bioavailability, particularly in groundwater. In Part 3 (September 2015 Vortex) I described the continuing problems associated with arsenic in California's Central Valley groundwater and possible geochemical factors responsible for arsenic's accumulation in Central Valley sediments. However, arsenic contaminated groundwater is a worldwide problem as indicated by a 2007 study that determined >137 million people in more than 70 countries are affected. This is a particularly significant and serious problem for countries in the Ganges Delta (West Bengal, India and Bangladesh), because their water is largely supplied from tube wells that have inadvertently supplied arsenic contaminated groundwater with subsequent poisoning of large populations. In the 1970s, thousands of these affordably priced (about \$100 each) shallow tube wells were dug, providing drinking water free of the viruses, bacteria, and parasites commonly found in rivers. However, it was not suspected that groundwater from the wells might contain high arsenic because the "new" water was not adequately analyzed. This naturally-occurring arsenic was first detected in the early 1990s, and it may have been slowly released from sediments by complex biogeochemical processes that promote reducing environments.

Evidence of arsenic poisoning soon became apparent. In Bangladesh, the situation is now devastating with at least half of the 7 to 11 million hand pumped tube-wells supplying groundwater with arsenic concentrations >50 $\mu\text{g/L}$. [The World Health Organization (WHO) recommended maximum contaminant level (MCL) is 10 $\mu\text{g/L}$.]

It is now estimated that at least 80 million people are affected and recent investigations determined that about 20 million people in Bangladesh are using water pumped from tube-wells contaminated with arsenic >50 $\mu\text{g/L}$ (Figure 1). However, according to the Bangladesh Atomic Energy Commission, arsenic concentrations in groundwater may range between 150 and 200 $\mu\text{g/L}$ in districts surrounding West Bengal. It is estimated that one in ten persons has the probability of developing cancer from arsenic contaminated water consumption.

Chronic arsenic exposure and poisoning (aka, arsenocosis), is associated with many human health problems, including both human non cancer and human diseases. Non cancer diseases include skin lesions (Figure 2) and neurological disorders such as impaired cognitive development in children. Other diseases include cardiovascular such as atherosclerosis, cerebrovascular diseases, ischemic heart disease, and diabetes. Reproductive outcomes such as maternal arsenic exposure are associated with fetal loss, small size at birth, infant morbidity and mortality. Cancers of the liver, lung, bladder, and skin are common to such arsenic exposures.

The source of the arsenic contamination is a hotly debated subject. The arsenic-containing groundwater occurs from shallow depths of 10 to 70m. Groundwater from depths >150 m usually contains less arsenic and therefore can be used as a sustainable drinking water source. Arsenic is not believed to be derived from arsenic-bearing sulfides such as arsenopyrite (FeAsS), which is suspected to be the contributing contaminant in California's Central Valley. Ganges Delta sediments are largely composed of sand-size particles consisting of quartz (SiO_2) and minor amounts of mica. However, there is evidence suggesting that the arsenic is contained in the hydrous ferrous oxides (HFOs) coating these quartz and mica sediment particles. Studies in other regions with similar arsenic contaminated sediments have shown that arsenic is readily sorbed to such HFOs. Release of arsenic from the HFOs may be enhanced by microbial reduction of HFOs because degradable

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(Motzer continued from page 6)

organic carbon is available from peat layers within the sediments. This microbiologically reductive dissolution allows release of the arsenic with production of bicarbonate, which may further exacerbate the arsenic release. Additional studies suggest

that massive groundwater irrigation may also lead to surface-derived organic matter being drawn down into the aquifer systems, thereby accelerating arsenic release.

In a future article on this subject area, I'll discuss another element that contributes to natural soil and groundwater toxicity.

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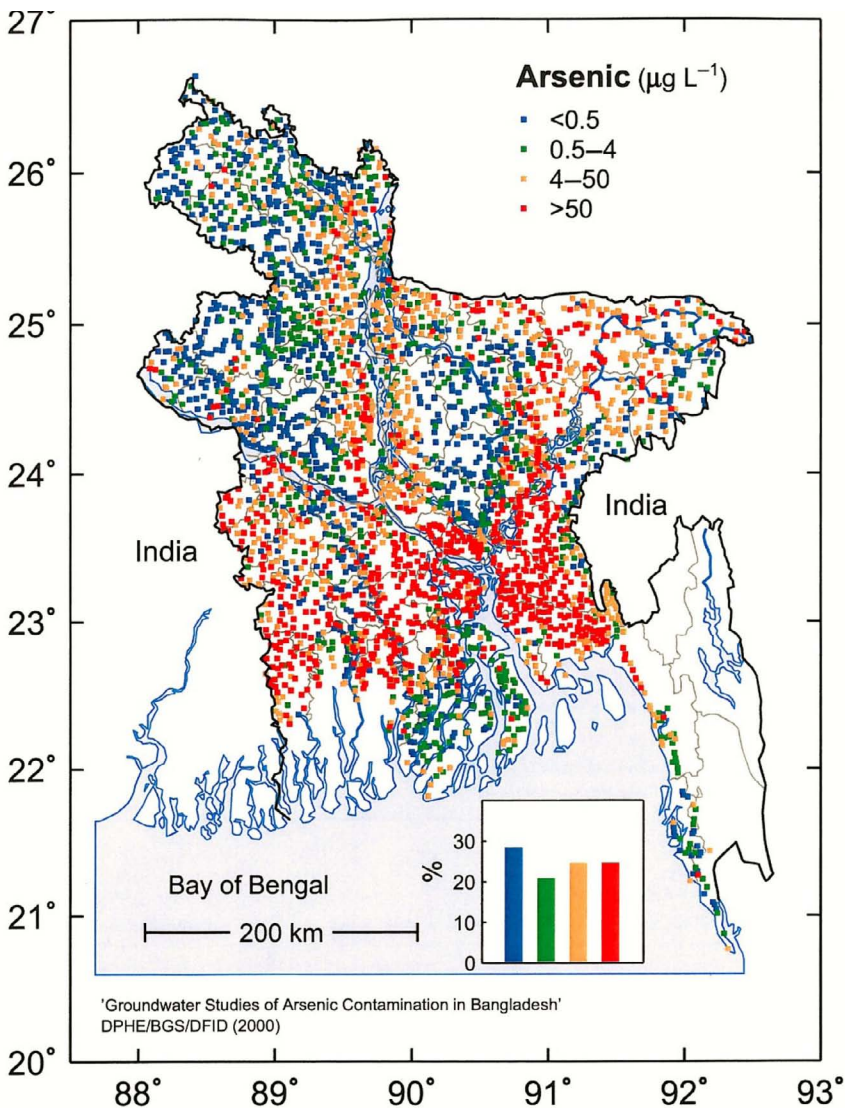


Figure 1: Arsenic concentrations groundwater in Bangladesh. Source, British Geological Survey, 2001, Arsenic Contamination of Groundwater in Bangladesh.

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Figure 2: Skin lesions caused by chronic arsenic exposure from drinking water. Photo from: http://www.unicef.org/bangladesh/wes_385.htm



CalACS Election Results

The 2015 California Section election was the first to be run electronically, as allowed by our Bylaws. Notification of the election to the members allowed for a paper ballot upon request. Four requests were received. The bulk of the ballots were voted on Survey Monkey. The slate of candidates was developed by the committee from suggestions made by members of the Section. The election filled Chair-elect, Treasurer, Director, Member-at-Large, Councilor and Alternate Councilor positions. In this election, the members were asked to vote for the two candidates they wanted to elect as Councilors from the four candidates who were nominated. The candidates for Chair-elect and Treasurer ran unopposed. No petitions were received proposing candidates for office. All the elected persons take their positions on January 1, 2016.

The 186 valid ballots received from the Section members were counted on November 17. The number of votes for each position were:

Chair-elect James Postma ¹	179	Treasurer Paul Vartanian ²	180
Director Attila Pavlath ³	93,	Mark Frishberg ³	91
Member-at-Large Margareta Sequin ⁴	150,	Liam Berryman ⁵	119
Dan Calef ⁵	110,	Igor Sobolev ⁵	89
Councilors and Alternate Councilors		Eileen Nottoli ⁵	97,
Lee Latimer ⁶	93 ,	Stephanie Malone ⁶	90,
Patrick Lee ⁷	58		

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The Chemist Challenge®

The Bay Area will be hosting its first You Be The Chemist Challenge®, an interactive academic contest that uses the drama of competition to excite grade 5–8 students about science. The Challenge tests students' knowledge of chemistry concepts, their real-world applications, and other topics that are included in standard science curriculum, such as:

- the scientific method
- properties of matter
- chemical formulas & equations
- chemistry in the human body

Participating schools and students have an opportunity to receive national recognition, scholarships, and prizes. The Challenge Champion, one chaperone, and one educator from each state even receive an expenses-paid trip to the national competition in Philadelphia is next in June! There is no cost to participate and study materials are provided free online to help students prepare for the competition. For a listing of school and student participation requirements and to download the study materials as well as a free activity guide for teaching K-8; visit www.chemed.org.

The Challenge was created by the Chemical Educational Foundation® (CEF) a national non-profit organization dedicated to enhancing science education for our youth. The 2014–2015 Challenge involved 34 states as well as the District of Columbia and Puerto Rico with nearly 40,000 students. We continue to grow the program each year and hope to get your school involved! Please contact lily_lew@yahoo.com if you have questions or would like to register your school for the Challenge.

(Chair continued from page 7)

report: Our long-term regular meeting place for ExComm meetings, Mandarin Gardens in Berkeley was destroyed by fire at the end of November. Thankfully no one was injured and we wish the owners the best as they make plans to rebuild. As such, we are looking for a new home for our monthly ExComm meetings.

Finally, since this is my last report as Chair I wanted to add a couple of notes. It has been a great experience for me; I have had the pleasure of working with/learning from a terrific Executive Committee and our wonderful office manager, Julie

Mason. During 2015, I believe that we have continued to serve the membership and community in developing and participating in unique programs created to edify members and nonmembers of all ages in the wonders of chemical science. In addition, CALACS continues as one of the strongest ACS sections in the world and I am confident that will continue in 2016 under Lou Rigali's capable leadership. I look forward to continuing to help Lou and the ExComm to build an even stronger organization during the coming years. Certainly contact me at charles.gluchowski@gmail.com or 925-640-0550 if you have any questions or comments.



(Election ...continued from page 8)

1 Elected Chair-elect and Director (three year term) 2 Elected Treasurer and Director (two year term) 3 Elected Director (two year term) 4 Elected Member-at-Large (two year term) 5 Elected Councilor (three year term) 6 Latimer ran in the ACS election and was elected an At-large Director of the Society. He vacated his local section position and Malone is

New ACS Liability Insurance for Educators

There has been heightened awareness of the dangers of laboratory accidents and the liabilities related to chemical educators when these accidents occur. Educators can no longer assume that their institution or current educators legal liability policy will defend them should a lawsuit arise from their academic duties.

Currently the insurance marketplace offers minimal protection for chemical educators by excluding Contingent Bodily Injury and Pollution Liability from their standard educators' legal liability policies. In response to member concerns, the Board of Trustees, Group Insurance Plans for ACS members is pleased to announce the availability of the Chemical Educators Legal Liability. Additional information and application can be found at <https://acs.haysprograms.com/application-info/chemical-educators-legal-liability-product-information>

The new plan specifically covers Contingent Bodily Injury, Pollution Liability, Employment Practices and Sexual Harassment within the policy. The plan will help educators protect themselves against risks within classrooms, teaching and research labs and community outreach activities. Additionally, it will also provide broad coverage to address the exposures of high school, undergrad and instructional staff and faculty employed by private, public, charter and higher educational institutions.

Key Features:

The Chemical Educators Legal Liability serves as a primary insurance for individuals, over and above the coverage provided by the institution.

A liability limit of \$1,000,000 from professional liability lawsuits.

Sublimit at \$500,000 for Pollution Liability with option to increase limit to \$1,000,000.

Sublimit at \$500,000 for Contingent Liability with option to increase limit to \$1,000,000.

Sublimit of \$25,000 for Sexual Harassment.

Sublimit of \$250,000 for Intellectual Property.

Plan covers claims brought against an insured and reported to the insurer during the policy term

(Pavlat, continued from page 4

of understanding? This talk will give numerous examples on what our life would be like without the benefits chemistry provides and continue to give. The first amendment gives freedom to the media to report disproportionately on the effects of chemistry on our life. It is the chemical

community's responsibility to remind the public to the numerous benefits of chemistry, once proudly displayed on the logo of a large chemical company: "Better things for better life through chemistry." What can and should be done by every one of us? The talk will give answers to this question.



The Section website store is looking for a Periodic Table design that is copyright free that can be used to imprint t-shirts, puzzles, place mats and framed posters. Send your suggestion to Lou Rigali LR101898@aol.com

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- Universities & Colleges for teaching positions and laboratory personnel
- Hospitals for technical and research personnel

There are several web sites that may help you search for these open positions.

- www.mboservices.net
- <http://www.calacs.org/page.asp?id=22>

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