THE VORTEX

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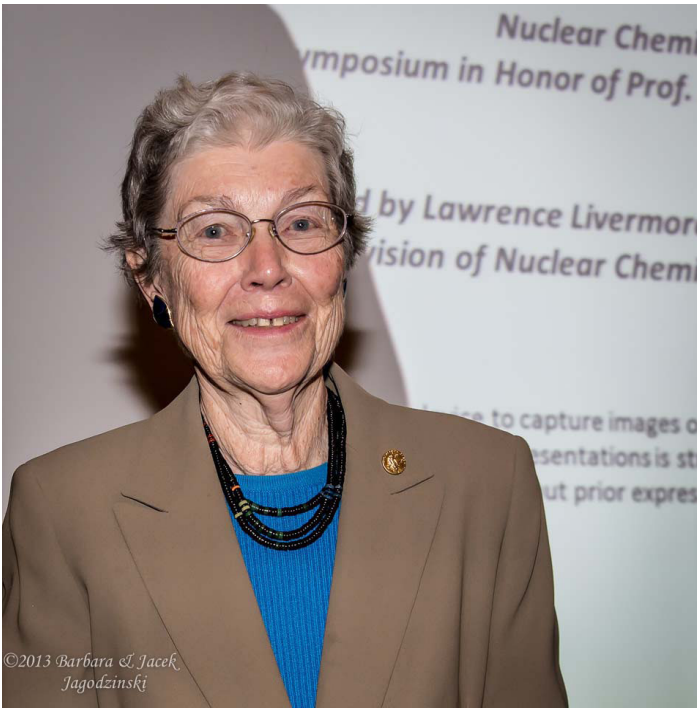

Professor Darleane C. Hoffman, the keynote speaker at the Western Regional Meeting, October 2013, for the Special Nuclear Symposium honoring her life and work

"Sixty-five years as a nuclear chemist - A retrospective view"

Table of Contents

CHAIR'S MESSAGE	PAGE 3
JOINT SANTA CLARA VALLEY/CALIFORNIA SECTION NOVEMBER MEETING	PAGE 4
WCC NOVEMBER MEETING	PAGE 5
SCIENCE CAFE, NOVEMBER MEETING	PAGE 5
THE DIRT ON DRY CLEANING (W. MOTZER)	PAGE 6
A SUCCESS, WESTERN REGIONAL MEETING, 2013 (LEE LATIMER)	PAGE 8
WCC REPORT ON ITS PROGRAM AT THE WESTERN REGIONAL MEETING	PAGE 9
SOME PHOTOS FROM THE OCTOBER FAMILY SCIENCE NIGHT	PAGE 10
BUSINESS DIRECTORY	PAGE 11
INDEX OF ADVERTISERS	PAGE 11

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THE VORTEX

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Chair's Message

Wally Yokoyama

I am writing this Message on Halloween, Oct 31. The holiday season, Halloween, Thanksgiving, Christmas and New Years, starts today. In addition to the holiday celebrations I hope we will be able to celebrate the election of another ACS President from the California section. If you have not already voted, the deadline is Nov. 15 and the candidates are: "http://cen.acs.org/articles/91/i37/President-Elect-G-Bryan-Balazs.html" Dr. G. Bryan Balazs, Lawrence Livermore National Laboratory, Livermore, CA; "http://cen.acs.org/articles/91/i37/President-Elect-Charles-E-Kolb.html" Dr. Charles E. Kolb, Jr., Aerodyne Research, Inc., Billerica, MA; and "http://cen.acs.org/articles/91/i37/President-Elect-Diane-Grob-Schmidt.html" Dr. Diane Grob Schmidt, The Procter & Gamble Company, Cincinnati, OH. We are fortunate to have a slate of exceptionally qualified individuals.

In order to maintain the high level of community activities that the California section is known for the section will provide souvenir T-shirts, mugs and other memorabilia of the events for sale. The proceeds will be shared with the event instution and the section. These items are custom designed for the event. The vendor will also develop unique artwork for your event. These items can be found at: http://calacs.deco-apparel.com/shop/category/T-shirts?c=871892&ctype=0.

Locally, Dr. Alex Madonik and company organized a fun filled and educational Math and Science Night at Thornton Jr High, Fremont, CA. Thanks to all the Section members who volunteered their time to make this event and other community events possible. The California and Santa Clara Valley sections' Western Regional Meeting (WRM2013) in Santa Clara, Oct 3-6, went off smoothly and gave local universities a chance to attend a conference, present their research and meet their colleagues without travelling a thousand miles. Women Chemist will host a meeting at the Exploratorium on November 15. A friend who recently visited the Exploratorium told me she spent several hours there but could have spent the whole day. It's worth visiting but the WCC event tickets are discounted, adults $20 instead of $25; and students $15.

Happy Thanksgiving

Join the California and Santa Clara Valley ACS Local Sections for a Joint November Section Meeting
Topic: "Science Journalism in the Current News Environment"
Speakers: Nadia Drake- Science journalist at WIRED & Peter Aldhous - San Francisco bureau chief with New Scientist Magazine

Date: Thursday, November 14
Time: 6:00 Social Hour
7:00 Dinner
8:00 Presentation
Location: Basque Cultural Center , 599 Railroad Ave.,South San Francisco, CA 94080
Cost: $30.00, Duck Legs Confit or Breast of Chicken Chasseur or Vegetarian Pasta
Reservations: Required, Please RSVP by email to office@calacs.org or by phone (510) 351-9922 no later than November 7, 2013. You may prepay by sending a check payable to Cal. Section ACS at 2950 Merced St., #225, San Leandro CA 94577. When making reservation please include your name, address, company/school affiliation, number of people (and their names) in party. If you are unable to honor your reservation and do not cancel by Monday, Nov. 11th, you will be invoiced following the dinner meeting.

Nadia Drake
Abstract:
The Metamorphosis: Turning Science into News in a Changing Media Landscape

Most research isn't born being "news" – that transition requires work from both scientists and journalists. As an omnivorous science reporter who's been assigned to cover several, completely unrelated beats, I've found that some scientific fields seem to spawn news much more easily than others. So, what does it take to transform an elegant experiment into an accurate, engaging news story?

Biography

Nadia Drake is a science journalist at WIRED, reporting on materials science, marine mammals, and mega-spiders. Before that, she covered astronomy for Science News, based in Washington, DC. She has written news and features for Nature, New Scientist, Nature Medicine, Proceedings of the National Academy of Sciences, the San Jose Mercury News, and the Santa Cruz Sentinel. In 2012, she won the D.C. Science Writers Association's Newsbrief Award. Nadia is a 2011 graduate of the UC Santa Cruz Science Communication program, and earned her PhD in genetics from Cornell University. She loves reporting from the field, and has traveled to such places as China, Alaska, the Channel Islands, and California's redwood forests in pursuit of stories. Her favorite moon is Iapetus. See her articles at http://www.wired.com/wiredscience/author/nadiadrake/.

Peter Aldhous
Abstract:
The Best of Times; the Worst of Times: Science Journalism in an Era of Media Turmoil

Much has changed since I started writing about science as a PhD student in the late 1980s. Technology has opened a world of possibilities for multimedia journalism, and science provides rich material. At the same time, the cozy business models of print journalism have collapsed. I'll talk about the opportunities and challenges, from the point of view of an old-school science journalist who's embracing new skills including web development, and a teacher preparing science communication students to enter a fast-changing working environment.

(continued on page 10)

Women Chemists California Section
November Meeting
Saturday, Nov. 16, 2013
Exploratorium
Pier 15
San Francisco, CA 94111

Cost (Payable at the museum on the day of the event):
Adults (18-64), $20, Youth (6-17), teachers, students, seniors (over 65) and people with disabilities, $15
Title Discover the Exploratorium: Talk and Tour led by Lauren Thornhill
Time 10:00 Museum opens, 11:30-12:00 Lunch in the City View Room (bring your own or purchase from the museum) 12:00 Speaker presentation followed by informal tour 5:00 Museum closes
Reservation Please register by email to office@calacs.org, or by phone (510) 351-

Abstract

Join the Women Chemists Committee for a day at the Exploratorium at Pier 15 on the San Francisco waterfront. Participants are welcome to arrive at any time to explore the museum at discounted group rates. Join us in the City View Room with your lunch at 11:30 am for a presentation on the Exploratorium's history, founding and extended reach by Associate Director of Development Lauren Thornhill. Interested parties are invited to join Lauren for an informal tour of her favorite exhibits – or stay and explore on your own.

Biography

Lauren Thornhill joined the Exploratorium in 2009 as a member of the fundraising team responsible for the $300 million capital campaign. Working for the Exploratorium combines Lauren's passion for access to education and interdisciplinary

(continued on page 10)

SCIENCE CAFE
Co-Sponsored by Lafayette Library and Learning Center Foundation
California Section ~ WCC of the American Chemical Society

In 1904, President Teddy Roosevelt committed the brains of American engineering and the brawn of America's industrial machine to build a canal of unprecedented scope and challenge. The Panama Canal's successful construction was the result of the convergence of extraordinary men, machines, and methods. Paul Giroux, recipient of the American Society of Civil Engineers' prestigious Civil Engineering History and Heritage Award for 2013, will share highlights of this remarkable construction feat, illustrating how American ingenuity was harvested in order to create what many call the 8th Wonder of the World
When: Tuesday, November 19th 7:00pm - 8:00pm

Reseervations: 925-283-6513 x103 or email:reserve@LLLCF.org

Boxed Meals Available for Pre-Purchase: $10 (non-refundable). Beer, Wine, Beverages, Coffee & Cookies for sale in the Community Hall.

The Dirt on Dry Cleaning Part 5

Bill Motzer

In Parts 1 and 2 (January and March 2013 Vortex), I described the history of dry cleaning from Greco-Roman times until the Industrial Revolution. In Part 3 (May 2013 Vortex), I described the history of organic solvent usage in dry cleaning in the 20th century, noting that by 1962, tetrachloroethene (PCE) had become the leading cleaning solvent of choice in the U.S. In Part 4, (September 2013 Vortex), I discussed PCE's unique chemical and transport/fate characteristics and its environmental impacts. Once PCE is in soil and groundwater, it is difficult to remediate because it is rather persistent and recalcitrant to some remediation methods. But before we can remediate or clean up a PCE-contaminated (or other chlorinate solvent) property, we may need to determine the source or sources for such a release. In this type forensic investigation we may be required to determine who is responsible for the release or releases and when they occurred. This can be done using several different forensic techniques including forensic geochemistry.

Groundwater Plume Mapping and Modeling

For many chlorinated volatile organic compounds (CVOCs) contaminated sites, extensive groundwater monitoring may be required by regulatory agencies such as the California Regional Water Quality Control Board or the U.S. EPA to determine the extent of groundwater contamination. Groundwater sampling points and monitoring wells are installed, which are carefully sampled using required and specific EPA methods of analyses. When a plume's extent has been defined, it is drawn or shown on a map with equal lines of concentration in groundwater; these are referred to as isoconcentration contours. If one knows the CVOC plume's extent (length, width, and depth), its transport and fate characteristics, its degradation products, and rate of groundwater flow, one can back calculate when and where the release or releases occurred. Frequently this is done with the aid of a numerical or computer model.

Fingerprinting CVOCs Using Stable Isotopes

Compound-specific isotope analysis (CSIA) is a relatively new and successful analytical method for determining chlorinated solvent sources and for also determining and tracing solvent degradation (both biotic and abiotic) in groundwater plumes. This is done by analyzing the stable isotope ratios of carbon, chlorine, and hydrogen that comprise CVOC molecules. The isotopic ratio analyses are returned in delta (δ) notation: i.e. δ13C for13C/12C, δ37Cl is 37Cl/35Cl, and δD is 2H(D)/1H. All are measured against a specific standard and reported in per mil (‰).

Several well researched and applied studies are in the scientific literature. For example, a Toronto, Canada study showed distinctively different δ13C signatures for the parent solvent PCE and daughter products trichloroethene (TCE), cis-1,2-dichloroethene (1,2-DCE), vinyl chloride (VC), and ethane when compared to those from another source. In another study, a plot of δ13C versus δ37Cl showed that there were distinctive ratios or fingerprints for PCE, TCE, and 1,1,1-trichloroethane (TCA) from different manufacturers. The contaminated property's PCE had the same carbon isotopic signature for all of the collected and analyzed soil and groundwater samples suggesting that PCE released on the site was produced by the same manufacturer. A comparison of the site's carbon isotopic signatures was made with published isotope data for several U.S. manufacturers of PCE, allowing for the producer's identification.

At another site in New York, carbon, chlorine, and hydrogen isotope ratios of PCE, TCE and cis-DCE were measured in groundwater samples. The carbon and chlorine isotope ratios indicated that the CVOCs from this site were from at least three sources representing two distinctive PCE plumes and one distinctive TCE plume. The hydrogen isotope ratios of TCE further indicated that the TCE plume had not migrated into adjacent wells and that

(Continued on page 7)

(continued from page 6)

the detected TCE was most likely from another source.

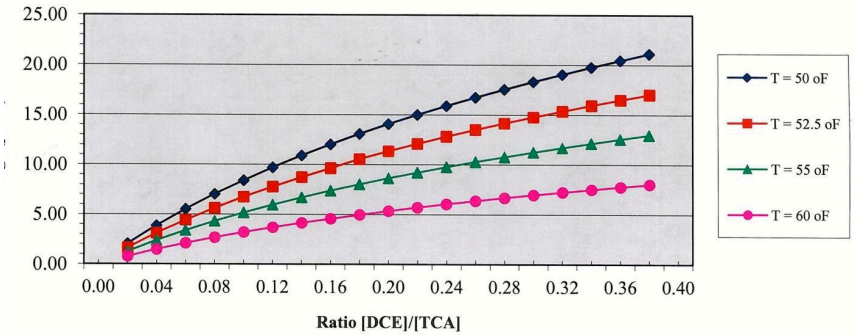
Other stable isotopes have been used to define CVOC sources. For example CVOC fingerprinting (source identification and differentiation) has been done for the San Gabriel Valley Superfund site which has both PCE and TCE groundwater plumes. One study analyzed groundwater samples for strontium-87 and strontium-86 (87Sr/86Sr), PCE and TCE. A plot of 87Sr/86Sr against PCE/TCE showed that there were four distinct industrial sources.

CVOC Age Dating Techniques

There are no current reliable methods that can directly age date chlorinated ethene compounds such as PCE and TCE. This is because these compounds degrade or decay largely by the action of anaerobic bacteria on the CVOC molecule. This results in degradation at variable or non predictable rates. However, the chlorinated ethanes (e.g, TCA) mostly degrade under abiotic conditions to 1,1-dichloroethane (1,1-DCA) and 1,1-dichloroethene (1,1-DCE). Most of the abiotic decay is by hydrolysis, which has a predictable first order rate constant that is temperature dependent. Therefore, based on experimental work of known DCE/TCA ratios, the age of a TCA release can be determined (see figure).

Once a forensic investigation has been completed, CVOC remediation can begin; how that's accomplished will be the subject of the final part in all of "The Dirt on Dry Cleaning."

Determining Age of a TCA release



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44th Western Regional Meeting A Grand Success!!

On October 3-5 at the Hyatt Regency Santa Clara the California and Santa Clara Valley Sections co-hosted the Western Regional Meeting to a rousing success enjoyed by all with excellent reviews. There were 400 papers and posters presented in over 45 sessions to nearly 1000 attendees, including 150 middle and high school students presenting posters on the elements, and many international students participating in a dynamic international student program. The Exhibition drew over 45 companies and organizations to show their wares and talk about their services and organizations. The meeting website with activities, program and abstracts, and information on exhibitors is at www.wrm2013.org.

At the meeting banquet on Friday three regional awards were presented. The E. Ann Nalley Award for Volunteer Service was presented to Rita Boggs of the Southern California Section. The Stanley Israel Award for Advancing Diversity in the Chemical Sciences was presented to Wilma Amaro of Pueblo High School, Tucson of the Southern Arizona Section. The CHED Award for Excellence in High School Teaching was presented to Michael Morgan from Los Angeles.

Special events took place each night. Richard Zare of Stanford presented a talk and demonstration of "Why Shaken, Not Stirred" to the banquet audience of over 80. Charles Bamforth of UC Davis gave an uplifting talk on "Pilsner, Porter, Polysaccharides and pH: The Classy Chemistry of Beer" to 65 thirsty souls who then applied his guidance in the tasting of samples from the Striker and the Heritage Brewing companies at a reception on Thursday evening. Shirley Corriher and Sara Risch led a discussion and Q&A session on Food Mysteries at a reception on Saturday afternoon, including demonstrations, to send the meeting and the reception's 65 hungry attendees to a great ending. The tables at all of these fun events were decorated with the flask and poppy icon of the meeting, a rare opportunity to bring an icon to "life."

The sessions were highlighted by many interesting and well-attended topics in basic as well as broader areas. The Symposium honoring Darleane Hoffman was a great success with both new information and reminiscing among the many speakers who had worked with Darleane. The Cope Scholar Awardee Symposium for Sarah Reisman covered the latest in Total Synthesis work from four outstanding speakers to a large crowd. The sessions on Hydraulic Fracturing had standing room only attendance in this key area for California and science. The Women Chemists at Various Stages of Their Careers session was highlighted with a lunch talk by ACS President Marinda Wu. The two days of sessions on Entrepreneurship highlighting nuts and bolts to stories of local companies were a great learning experience. Outstanding sessions were presented in many areas of chemistry from process chemistry to medicinal and pharmaceutical to solar to renewables to biofuels to biotechnology to IP updates.

Workshops were a big success at the meeting with the career and leadership courses meeting their maximum attendance numbers for the Finding your Pathway and Leadership Development courses on Strategic Planning and Collaborating Across Boundaries. The joint workshop with CACO-PBSS on Salt Selection and Polymorphs in Pharmaceutical Materials was very well attended. Safety Workshops on Lab Waste Management and Training for being a Chemical Chemical Hygiene Officer were also held.

The next WRM will be hosted by the Orange County Section. November 2015. Also, the 247th ACS National Meeting will be in Dallas, March 16-20 and the 248th ACS National Meeting in San Francisco, August 10-14, 2014.

General Co-chairs L. Latimer and N. McClure want to thank the huge efforts by Program Co-chairs Bonnie Charpentier and Janet Gunzner-Toste and the members of the Core group to accomplish this great outcome: Paul Vartanian, Ean Waren, Lou Rigali, Will Kuo, Ihab Darwish, Bryan Balazs, Tom Tarnowski, Jane Frommer, Mark Frishberg, Dave Parker, Charlie Gluchowski, John Bauman, and our ACS Meeting Planning Partner Nicole Fisher and CalACS Office Manager Julie Mason.

Lee Lattimer, Co Chair

Women Chemists meet at the Western Regional Meeting, Oct. 5, 2013, Santa Clara, CA,

The CA Section Women Chemists Committee planned a unique afternoon program, starting with a keynote speech by ACS president, Dr. Marinda Li Wu, who described her background and summarized her presidential themes.

This was followed by the main attraction: Five Women Chemists at Various Stages of their Chemical Careers. A special attempt was made to invite speakers who spanned approximately 4 decades of chemical career experiences. It was a unique, and as far as we know, first of its kind assembly of women chemists at one meeting. As little as 40 years ago, it would be highly improbable that these women would be together in one place. Times have changed! Elaine Yamaguchi introduced the speakers:

Latisha Paw U, graduate student at UCBerkeley
Yaya Zhu, Chevron
Iyun Lazik, professor at City College of San Jose
Janet Schunk, Siemens
Trudy Lionel, Bayer

Each panelist was given 15 minutes to give their background and describe their biggest challenge and how they overcame it. After the speakers' presentation, there was a break, where members of the audience gravitated to one or more speakers for more intense discussions. After the break, we listed the teachings from each speaker. For those Section Members who were unable to be at the meeting in person, we list those teachings on the Cal ACS website, www.calacs.org. Look for Women Chemists Committee.

Elaine S. Yamaguchi

Joint Meeting continued from page 4)

Biography

Peter is San Francisco bureau chief with New Scientist magazine and reports on biology, medicine, social sciences and the environment — from genetics and stem cells, through ecology and conservation, to psychology and psychiatry. He also teaches in the Science Writing Program at the University of California, Santa Cruz. He is especially interested in investigative and computer-assisted reporting, and he's fascinated by data visualization. See his website at www.peteraldhous.com for articles and his data images. Peter got his break in journalism in 1989 as a reporter for Nature in London, fresh from a PhD in animal behavior. Later he worked as European correspondent for Science and as news editor for New Scientist. Prior to moving to California in October 2005, he spent five years as chief news and features editor with Nature. His articles have won awards from the Association of British Science Writers, the Association of Health Care Journalists, the UK Guild of Health Writers, the Society of Environmental Journalists, the Royal Statistical Society and the Wistar Institute. When the opportunity arises, he loves to combine work with travel. Over the years he's reported from countries including Cameroon, Cambodia, China, Indonesia, Mexico, Russia and Vietnam.

(WCC continued from page 5

studies. As a curious child Lauren used art and inquiry as a way to understand scientific phenomena.

Lauren spent the early part of her career in the arts working in marketing and membership for the Biennale of Sydney and the Los Angeles County Museum of Art. After discovering her passion for philanthropy, Lauren moved to higher education fundraising eventually becoming Director of the Annual Fund for Scripps College in Claremont, CA. Lauren holds a BA in film and women's studies from Scripps College.

Artists & Members

The Section will soon be offering chemistry and science related products on its website for sale. If you have some ideas for designs or products, please send a note to Lou Rigali...qpfans@qpfans.com

Family Science Night

Photos from The Family Math & Science Night at Thornton Junior High School, Fremont, October 23. 2013. What happens when 1000 attendees answer the call to school-made ice cream. Photos by Alex Madonik

BUSINESS DIRECTORY

SEARCHING FOR THAT SPECIAL JOB?

There are many companies and organizations searching for chemical and biochemical personnel to fill important jobs in their organizations.

- Companies for laboratory and management positions
- 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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INDEX OF ADVERTISERS

Recruitment	11
ACS Vortex	11
Delsen	11
MassVac	BP
NuMega Resonance Labs	11
Pinnacle Material Laboratory	11
Robertson Microlit	7
Vacuubrand	11

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