

THE VORTEX

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Lethal Dose: Rat Poison & Local Wildlife

Local wildlife may inadvertently be poisoning wildlife. National Park Service researchers have found a direct link between exposure to anticoagulant rodenticides, commonly known as rat poisons, and the deaths of wildlife in and around the Santa Monica Mountains. New rodenticide works its way through the food chain.

- 1 Targeted rodents**
Also, rat poisons affect other rodents. All rodents that eat and may not become ill right away. They experience death, usually from organ failure, several days later.
- 2 Predators**
Rat poisons can be passed to predators that eat poisoned rodents.
- 3 Top of the food chain**
Anticoagulant rodenticides can be passed to predators that eat other predators that eat other predators.

Unintended victims

In the Santa Monica Mountains...

- 17 of 22 mountain lions tested positive for exposure, and four died from poisoning.
- 19 of 196 bald eagle tested positive for exposure to the Bad Blood anticoagulant rodenticide.
- 13 of 17 mountain lion tested positive for exposure to the Bad Blood anticoagulant rodenticide.

How anticoagulant rodenticide kills:
These compounds prevent blood clotting, which leads to uncontrolled bleeding and death. They may also suppress the animal's immune system, making it susceptible to other diseases. **Symptoms include:**

- Secondary diabetes, such as mange
- Blood in urine and feces
- Bleeding from wounds
- Bleeding from the mouth
- Reduced blood vessel, causing breathing difficulty
- Hemorrhage
- Hemorrhage

What is mange?
A microscopic mite that burrows into the skin and causes:

1. Extreme itching and skin lesions.
2. Hair and skin loss through the skin.
3. Infection, disfigurement, and other health problems, eventually leading to death.

Check the label!
Look for the most common anticoagulant compounds:

- Bromadiolone
- Diphacinone
- Brodifacoum
- Zifluthrin

SOURCES: Santa Monica Mountains National Recreation Area research, U.S. E.S. Science, United States Forest Service

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Center Left: Julie Beth Zimmerman

Lower Left: Nicholas Cross

Top Middle: Neal Byington

Middle: Lethal Dose: Rat Poison and Local Wildlife, National Park Service



Past and Upcoming Events

Julie Mason, Alex Madonik

- **SF AIDS Walk 8:00 am – 3:00 pm - Sunday, July 21st, 2024**

Location: Golden Gate Park, San Francisco

The SF AIDS Walk is coming up next Sunday, July 21st, and our Cal ACS team is all set to participate in this significant event.

We invite all of you to join us for the walk and support our cause. Your participation will help advance scientific research and innovation in the fight against HIV/AIDS.

If you are unable to join us physically, you can still support our team by joining online and making a donation. Every contribution helps us reach our team goal and directly benefits the SF AIDS Walk Foundation.

Event Details:

Date: Sunday, July 21st

Location: Golden Gate Park, San Francisco

Team: Cal ACS

Link: [Join or Donate](#)

Schedule: 8 AM: Check-in opens and the Red Ribbon Pancake Breakfast begins for fundraising participants

10 AM: Pre-walk festivities

10:30 AM: The 5K walk begins

12–3 PM: Post-walk picnic

We greatly appreciate your support and look forward to your participation in any capacity.

Together, we can make a significant impact. Thank you for your commitment to our cause.

For questions, please contact Atefeh Taheri at taheri.atefeh@gmail.com

- **Solano Avenue Stroll - Sunday, September 8th, 2024**

Location: Solano Avenue Albany/Berkeley

Time: 10:00 am to 5:00 pm

Cost: FREE!

Booth number: TBA

- **Women Chemists Committee (WCC) Meeting** – will be hosting their Fall meeting. (see flyer attached)

Guest Speaker: Julie Beth Zimmerman, PhD

Topic: “Designing Tomorrow”

Date: Saturday, September 14th, 2024

Time: 10:30 am- 11:00 am (PDT) Chatting; 11:00 am Talk and Discussion

Location: ZOOM

Cost: Free

Reservations: Visit the CalACS website at https://calacs.org/event/designing-tomorrow-professor-julie-beth-zimmerman/?instance_id=563. Registration closes September 12th, 2024, at noon.

For comments, please contact the California Section office at office@calacs.org

- **Cal ACS and AWIS East Bay Joint Event**
Guest Speaker: Dr. Christoph Carter
Topic: Diversity in Science: Bridging Communities through the History of AIDS Research
Date: Saturday, September 21st, 2024
Time: 12:30 to 4 pm
Location: The Lawrence Hall of Science, Berkeley
Cost: \$20 General, FREE for students
- **Lunch, Bocce, and Presentation**
Guest Speaker: Nicholas Cross, PhD
Topic: “Electrochemical Systems for Large-Scale Energy Storage”
Date: Saturday, September 28th, 2024
Time: 11:30 AM – 2:00 PM
Location: The Clubhouse at the Mission Peak Sportplex, 4020 Technology Place, Fremont, California 94538
Cost: \$25/person for professional members and guests; the cost for students and unemployed members is \$12.50.
- **Science in the Park at CSU East Bay**
Topic: National Chemistry Week, “Picture Perfect Chemistry – Fotografía Perfecta de la Química.”
Date: Saturday, October 5, 2024
Time: 9:00 am – 3:00 pm
Location: CSU East Bay, 25800 Carlos Bee Blvd, Hayward, CA 94542
Cost: Free

Cal ACS at the Solano Avenue Stroll

Sunday, 08 September 2024, 10 AM to 5 PM



Student volunteers from Alpha Chi Sigma (UC Berkeley) at the 2023 Solano Stroll

Our fall public outreach season kicks off right after Labor Day with the **Solano Stroll on Sunday, September 8th**. The entire community turns out for this celebration, and Cal ACS will there at the corner of Solano Ave. and Fresno Ave. As always, our booth will feature hands-on chemistry activities, with a focus on the [2024 National Chemistry Week theme](#),

“Picture Perfect Chemistry”

“Fotografía Perfecta de la Química”

We'll have copies of the [NCW 2024 edition of Celebrating Chemistry](#) and plenty of chemistry bling for scientists of all ages.

We'll be there at 9 AM to set up the Cal ACS booth, and we're looking for volunteers to help out throughout the day. Please contact [Alex Madonik, National Chemistry Week Coordinator](#), and let us know when you would like to join us. If possible, choose a two-hour shift starting at 10 AM, noon, or 2 PM. Help with setting up or packing up will also be greatly appreciated.

See you there!

California Section American Chemical Society **About the Speaker**



Julie Beth Zimmerman, PhD

Dr. Julie Beth Zimmerman is an internationally recognized engineer whose work is focused on advancing innovations in sustainable technologies. Dr. Zimmerman serves as Yale's inaugural Vice Provost for Planetary Solutions. She holds joint appointments as a Professor in the Department of Chemical and Environmental Engineering, School of Engineering and Applied Sciences and School of the Environment at Yale University and serves as the Deputy Director of Center for Green Chemistry & Green Engineering at Yale.

Her pioneering work established the fundamental framework for her field with her

seminal publications on the "Twelve Principles of Green Engineering" in 2003. The framework, in conjunction with Green Chemistry, is guiding the innovation of products and processes in academia and industry including her own research group on topics that include breakthroughs for the integrated biorefinery, carbon dioxide valorization, designing safer chemicals and materials, novel materials for water treatment, and analyses of the waterenergy nexus. Professor Zimmerman is the co-author of the textbook, *Environmental Engineering: Fundamentals, Sustainability, Design* that is used in the engineering programs at leading universities domestically and abroad. In addition, Dr. Zimmerman is the Editor in Chief for *Environmental Science & Technology*, is a Member of the Connecticut Academy of Sciences, and Fellow of the Royal Society of Chemistry.

Prior to coming to Yale University, Dr. Zimmerman was a program manager at the U.S. Environmental Protection Agency where she established the national sustainable design competition, P3 (People, Prosperity, and Planet) Award, which has engaged thousands of students from hundreds of universities across the U.S. since its inception in 2004. Dr. Zimmerman earned her B.S. from the University of Virginia and her Ph.D. from the University of Michigan jointly from the School of Engineering and Applied Sciences and the School of Environmental and Sustainability.

All are welcome

Saturday, September 14, 2024

Title

Designing Tomorrow

Time

10:30 – 11:00 am Chatting

11:00 am Talk and Discussion

Reservation

Please visit the CalACS website www.calacs.org to register for this meeting or use Brown Paper Tickets.

RSVP here!

Please register before Thursday, September 12, 2024, 12 noon. Your email address is needed to send the ZOOM link, which will be shared with attendees on or before the day of the event via Brown Paper Tickets.

Cost

Free!

Abstract

The half-century history of environmental protection is, at best, mixed and the approaches of the past will need to be significantly changed if we are going to realize a sustainable future. While there have been improvements since the 1960's in the most obvious and egregious problems such as air and water pollution in certain parts of the world, these advances have been uneven. The approaches to environmental protection of the past have been marked by characteristics including 1. A win-lose framework; 2. Reductionist, fragmented, analytic-only thinking; 3. Risk assessment; 4. Narrow metrics of success; and 5. Near-term vision.

The elements of a future approach that would allow for a pathway to sustainability include:

1. Alignment rather than conflict between environment/human health and economic goals;
2. Integrated systems thinking coupled with reductionist analysis;
3. Sustainable design as a goal rather than risk management;
4. Design for a dynamic world;
5. A focus on what to invent, create and innovate rather than simply what to reduce, limit, and minimize; and
6. Addressing inherent nature rather than circumstantial factors.

Questions?

Please contact Elaine Yamaguchi at eyamaguchi08@gmail.com

September 21st, 2024
The Lawrence Hall of Science, Berkeley

DIVERSITY IN SCIENCE: BRIDGING COMMUNITIES THROUGH THE HISTORY OF AIDS RESEARCH



Join us for this Cal ACS and AWIS East Bay joint event featuring the documentary *Surviving Voices - Quilt Panel Makers*, which tells the untold story of the AIDS Memorial Quilt. Dr. Christoph Carter, Senior Director of Clinical Development at Gilead Sciences, will speak on HIV treatment and prevention research advances. The event includes brief talks by National AIDS Memorial management and ACS California Board Members, followed by a networking session. Don't miss this opportunity to connect and reflect on the intersection of science and societal impact.

Register now [here](#) (\$20 General, FREE for students).

All proceeds from this event will go to [the National AIDS Memorial](#).

A limited number of travel assistance funds are available for eligible students. Apply [here](#).

Questions? Email taheri.atefeh@gmail.com

Agenda:

- 12:30 - 1:00 PM: Registration and Welcome with Coffee/Tea
- 1:00 - 2:00 PM: Screening of *Surviving Voices - Quilt Panel Makers*
- 2:00 - 3:00 PM: Talk by Dr. Carter, Gilead Sciences
- 3:00 - 4:00 PM: Networking Session with Food and Refreshments



Lunch, Bocce, and Electrochemical Systems for Large-Scale Energy Storage

Nicholas Cross, Postdoctoral Researcher
Lawrence Livermore National Laboratory, Livermore, CA 94550

The United States has set a goal to decarbonize energy production by 2035 and the entire economy by 2050. Multiple analyses estimated that to do so requires significant investment in energy storage technologies to time shift when the energy is produced by sources such as wind and solar to when the energy is consumed by users of the grid. Historically, energy has been stored using pumped hydropower which is limited geographically and by long startup/shutdown times, and therefore is unlikely to meet all the energy storage requirements for a decarbonized 2050 economy. Electrochemical technologies are well-suited to meet the needs of the grid of the future due to their capability to be sized to fit a range of power and energy applications as well as being able to respond to load changes almost instantaneously. Technologies of keen interest and high maturity are lithium-ion, sodium-ion, and multiple flow battery chemistries. In this talk, I will discuss the different battery chemistries under development by groups ranging from academia to industry. The fundamental mechanisms, material challenges, and economic drivers of each technology will be presented to provide a wholistic picture of each unique chemistry.

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344. LLNL-ABS-868591

About the Speaker:



Nicholas is currently a postdoctoral researcher at Lawrence Livermore National Laboratory (LLNL). His research combines experiments and computation to build new models for chemical and electrochemical technologies for a zero-carbon future to accelerate their characterization and development. He received his bachelor's in chemical engineering from Oregon State University, where he conducted research on carbon treatments for use in vanadium redox flow batteries. He received his master's and PhD in chemical engineering from Penn State University where he developed thermally regenerative ammonia batteries for converting low-temperature heat to electricity using spectrochemical ligands in a redox flow battery. In his current role at LLNL, he is researching methods for improving lithium batteries under extreme conditions, novel ionomers for electrochemical conversion of CO₂ to value added chemicals, and systems analysis of next generation carbon capture solvents.

Date: Saturday September 28th, 2024; Time: 11:30 AM – 2:00 PM

Location: The Clubhouse at the Mission Peak Sportplex, 4020 Technology Place, Fremont, California 94538

Join us at 11:30 AM for a buffet lunch and bocce on the spacious outdoor Patio. The formal presentation will start at 12:30 PM, with plenty of time for discussion and networking before and after.

Registration: Registration is required for in-person participation.

<https://calacs.org/event/lunch-bocce-and-electrochemical-systems-for-large-scale-energy-storage/>

The cost is \$25/person for professional members and guests; the cost for students and unemployed members is \$12.50; please register before September 15th if possible so that we can provide a count to the venue.

This event will also be streamed on Zoom – please register for FREE to receive the Zoom link.

Contact: Alex Madonik, alexmadonik@sonic.net



Neal Byington Named ACS 2024 Fellow

ACS names 2024 fellows. Neal Byington was section Chair in 2007. See the link below for list of 37 people selected for 2024.

<https://cen.acs.org/people/awards/ACS-names-2024-fellows/102/web/2024/07>

The actual print version does not appear to be available as of this writing.

Seeking Candidates for Cal ACS 2025 Governance

The California section of ACS will be conducting the election for 2025 officers by electronic balloting, using Momentive (previously known as SurveyMonkey). The following positions are open:

1. Chair-elect
2. Secretary
3. Councilor (2 positions)
4. Alternate Councilors (4 positions)
5. Director
6. Member At Large (3 positions)

If you are interested in running, please send a short bio and a one-page candidacy statement to Michael Cheng (michaeltcheng@gmail.com), indicating the position of interest by 9/30/2024. Ballots will be sent in early November.

Editorial for Local Membership Decline – More Award Focused, Less Professional Affairs

Donald MacLean, editor

Professional societies have taken it on the chin; ours is no exception. It seems there is a quiet quitting going on with professional societies that are not affiliated with job accreditation. To a certain extent, the demise of the local manufacturing industry and Covid 19 are to blame, but there are other contributors. Another easy scapegoat is the cost of membership, but ACS is one of the cheapest memberships out there, and as my wife describes something like ACS, it's good value. As a matter of fact, ACS has free membership categories such as unemployed member, and community associates. ACS still has a print magazine which has information related to industry, and members can get searches and articles for free, depending upon the membership type. When comparing ACS to other scientific societies with local representation, our membership numbers are in decline, but we are still alive. One glaring membership affiliated group that has abandoned ACS is the industrial chemist. One relevant reason for the decline is the lack of industrially oriented topics put out by National and Local ACS.

Our connection with National ACS:

The National ACS is based in Washington, and the local CalACS section is based in Northern California. For California, your ACS membership automatically gives you a local section membership which will be based on your residence or work location. In Northern California, Sacramento, Silicon Valley, and California section members intermix activities and cross section borders. Annual society dues are paid to the National ACS, which then redirects local voluntary dues back to the local section, as well as an allotment based on the number of local members. Certain programs like SEED and activities like Councilor travel are reimbursed or given a set amount. The remaining financial transfers come from internal grants.

ACS National has been telling us about declining membership going back to 2010. Their explanation has been the demise of industry in the US and the loss of companies paying employee dues, which is true. The California section has been immune, so to speak, as one loss has come with one gain elsewhere. ACS National has tackled the problem by redefining memberships and creating a tier membership scheme to lessen the annual membership fee yet still maintain numbers. Locally, our section has lost our technical and industrial emphasis, replacing these with public outreach, global warming, and DEI topics (Diversity, Equity, and Inclusion). Except for the period covering Me Too and the Social Justice period, our local section has been run by the same people with periodic losses, ergo a smaller executive group with less diversity and less inclusion. New volunteers have not stayed on or active beyond 3 years, stating family or lack of industrial focus for their quitting.

Programing focus and membership classification changes:

The 2019 to 2022 period membership decline coincides with a Social Justice push by the executive committee. The executive committee (Excom) operates on an advisory model with little opposition to proposals, basically tacit approval. In March 2020 I had agreed to be the next The Vortex editor starting in September 2020, which was pushed out to September 2021. In the February 2021 local Excom meeting, I found only 1 new person from 2019-2020 remained who pushed the Social Justice agenda. The next month membership numbers came out, and it was a shocker.

During the 2004 to 2015 period our membership declined by 6% over the 10+ year period. In 2017 our section registered around 3400 members. This is the number most of us had in our

heads. At the end of 2018 we lost another 3.4%, end of 2019 another 6.2%, then in 2020 we lost another 1.9%. The 2020 numbers are interesting as in person meetings that drive first time memberships did not affect the numbers as the society keep nonrenewals on the active membership list. In the March 2021 Excom meeting, the 2950 member value was announced, which came as a true shock leading to a discussion. How did we lose so many? Interestingly, the losses did not happen during the initial Covid 19 term. The losses kept going into 2022 and have settled to around 2400 members after a membership redefinition which was implemented to stop the bleeding. The huge 2022 drop is the result of moving nonpaying members to Community Associates status. I put those numbers into The Vortex (January 2022, October 2022) with an update in Table 1. Our membership numbers have not recovered even with restructuring memberships (September 2022), and the re-establishment of in-person meetings. However, a new category, Community Associates, has boosted total numbers, though they are not full members, meaning they do not vote or run for section office.

Table 1. Local Section Membership Numbers						
Year	Section Full Members	Voted in Section Election	Percent Voted	Change in members from previous year	Percent change from previous year	Sum percent change from 2017
End 2023	2574	224	8.7%	235	10.0%	75.0%
End 2022	2318	241	10.4%	-456	-16.4%	67.5%
End 2021	2774	268	9.7%	-278	-9.1%	80.8%
Mar 2021	2950	NA	NA	NA	NA	
End 2020	3052	250	8.2%	-58	-1.9%	88.9%
End 2019	3110	240	7.7%	-206	-6.2%	90.6%
End 2018	3316	271	8.2%	-117	-3.4%	96.6%
End 2017	3433	335	9.8%	NA	NA	NA
New classification introduced summer 2022.						
End of 2022 - New model applied, move nonrenewals off role into Community associates						
Community associates: October 2023 at 1372 members, June 2024 at 1700 members						

Chemluminary Awards Drive the Activities / Programs:

What I am about to say is not politically correct, but I have had some feedback that rings a bit of truth here. I have given our National ACS Executive Committee members (i.e., past Presidents, Directors) feedback, but my feedback did not go anywhere. The California Section is lucky that it has a large trust fund with contributions from bequests and investments. As an industrial scientist who thinks a professional society is for networking and technical continual education, it would surprise you that the local section lack of job programs and technical programming is from the way National ACS prioritizes how the local section receives hand-me-down funding via targeted grants and write up grant requests from predetermined topics put out by National Committees. Comparing the mid 2000s Industrial Relations Committee with the committee of the same name today, you would not recognize it. This committee finances other committees and special programs, which then provide money to the local section. These topics tend to be for high school education, DEI, science café, attending meetings, and equipment.

None of these are midcareer professional topics. This nonprofessional focus is then reinforced by using National ACS Chemluminary Awards as the only evaluation and which are given out in the Fall National Meeting. What is worse is that the category nominations are self-nominated. We do not get an award for managing money, retaining members, employment, or technical knowledge dissemination. This is the reason why the focus of local programs has not been industrial, or career continual education.

Other Contributing Factors:

There are other reasons why technical and industrial foci are lacking:

1. A recent trend has instrument and service companies providing articles to professional journals under the guise of minireviews and compendia changes. These presentations tend to push to you their latest NGS (Next Generation Sequencing), container closure integrity, or automation instruments. If you are in industry, especially in Analytics and Quality, you know what I am saying. This is a simple way to get presenters, but presentations tend to skew towards applications.
2. The Excom is driven by about 20 people, with 10 people who are really active in setting activities. Of those 20 people, only 5 are industrial. Being Berkeley-centric with a negative view towards oil, and nuclear, and a drive for "climate change" has pushed activities like Earth Day. The section's most active group is the Women's Chemistry Committee (WCC). The WCC has academic and industrial topics, but a disproportional amount are topics like personal empowerment and overcoming challenges for women mostly presented on a Saturday. The fourth most common topic is Science Nights at elementary and middle schools.
3. The cost for holding meetings is expensive. As an example, the May Emeryville ABPDU facility tour for ~25 people was a money loss event as the restaurant cost was \$1400, where the \$30 / person cover charge only covered about half of the cost. This was one of the better financial outcomes we had with an in-person restaurant meeting. Science Nights cost nothing.
4. Industry keeps their activities a secret and their presentation can be misleading. External industry presentations need multiple level approvals with legal department approval at the end. But there is one more thing that is not said, and that is you cannot look too good, because jealousy plays a role in getting approval and contrary to what is said, if you have time to do something other than work, then you are not working enough. This creates a disincentive to make a presentation. In addition, there is the disinformation that comes with some industries that I personally have witnessed and if I am vouching for someone, I want to make sure what is presented is correct. The best example of misinformation was with raw material testing where the initial confirmation identification tests use IR, and HPLC. Yet these methods were not mentioned by the first 2 presenters (a lie by omission, and by misdirection) for an expert committee that I was affiliated with. I stated to the second presenter, who was well known and my colleague on another expert committee roundtable event that we use HPLC and IR as our primary method for raw material identification. That person responded that what I said is actually what they really do.
5. National Meetings lack an Industrial Focus. This is most visible with the Exhibits. I used to attend the meetings to present, and the see instrumentation. It is rare to see an established instrument company bring in their instruments to places where the Unions mandate that the instruments must be moved by union personnel with extortion level

pricing. In addition, the programs and awards are geared toward academics, and the meetings are held around the academic year.

Final note:

Last issue I had an editor note for writers on membership decline topic. No one volunteered, but I did get feedback. It turned out to be industrial just as 4 others that I had before the call out. One thing is a desire to know what companies are downsizing, which is not the direction I was expecting.

Your Food and Relay Toxicity

Donald MacLean

This month's pharmaceutical / agriculture topic has to do with animal disposal. Animal carcass disposal at work was simple, put them in the refrigerator / freezer and the animal facility dealt with the carcass. The carcass and everything that touched it was incinerated as biohazard material. This article will deal with the agricultural and recreational aspects (e.g. with a pet horse) of carcass disposal.

Animals can die from old age, lightning, chill, drowning, bloat, flu, disease, et cetera. The one that I dislike is the predator, especially when an injury is the result of a predator. Each year there is a high attrition from predators such as the coyote, fox, hawk, dog, racoon, etc. For the hoofed animal, except for lambs, only a small amount of the animal is eaten if at all, so the carcass needs to be disposed. With predator kills you have choices: eat the animal, bury, landfill, incinerate, render, or let the vultures and ravens reduce the carcass down to bones. At first, I buried sheep, but that was a lot of work. In one case the animal was dug out by a scavenger. Dig deeper, but, alternatively, why not leave the animal out for scavengers?

In August 2023 a coyote attack got a hold of my flock foundation ewe. In this case the ewe survived the attack but the intestines were protruding. There was no way to save the ewe so I called the vet to come out. We put it down by injecting barbitol through the neck. A neighbor got the responsible coyote's picture and texted me its image. While I was watering, her sister came out to talk to me about the coyote. I mentioned how surprising so many animals are killed during our lifetime just to eat. The neighbor also concurred as the coyote is doing what is necessary to survive. Each animal has its choice parts, which can be used to identify what did the killing. The coyote goes through the abdomen to eat the liver and heart. A hawk rips the head off chickens to only eat the lungs. So much of the animal is left behind for scavengers.

Fast forward to 2024 and I had another incident where I had to euthanize - this time a hypocalcaemia postpartum ewe. The ewe was never going to stand up again and had suffered too much. The week prior I had administered 2 doses of an antibiotic (LA-200) as I suspected Listeriosis. In this case I brought the ewe to the veterinarian for the second time. Again, the animal was examined, and barbitol was administered via the neck. The vet used 15 mL Euthanasia solution which had a blue tint. This then meant the carcass disposal could not be through rendering or butchering. The vet could take the carcass, or I could handle disposal. If the vet took it, an orange letter B was required to be on the forehead. The why follows later. I took the ewe, and I buried the animal 3 feet under, then watered the backfill dirt to seal the scent from digging scavengers.

Rendering Animals

Rendering is the process of converting recently deceased livestock into useful byproducts such as feed protein. Rendering converts low value material into stable useable materials. Most of this material comes from slaughterhouses (packinghouse waste), and food processing facilities. Safe rendered products are used in the manufacturing of many products from pet foods to cosmetics and other everyday products (Figure 1).⁴ California has an organization that is responsible for rendering facilities, the Meat, Poultry and Egg Safety Branch (MPES).¹ It licenses and inspects rendering facilities for compliance with regulations to ensure that the

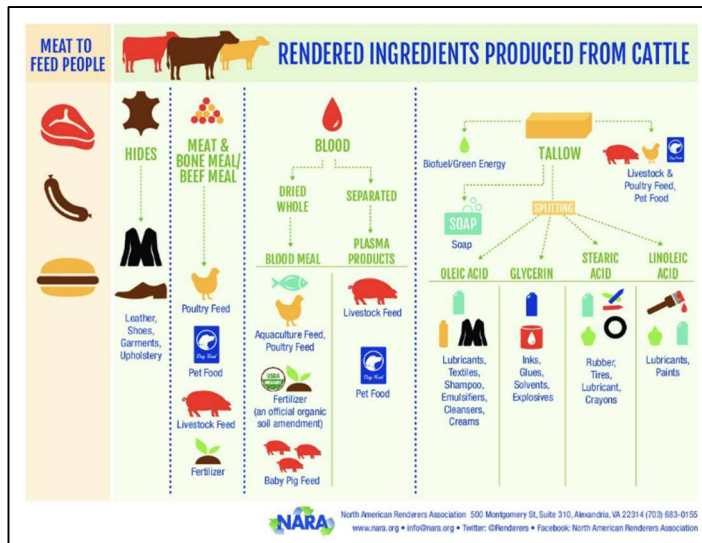


Figure 1. Rendered Products Scheme.⁴

associated inedible products are handled in a safe manner, protecting human health, animal health, the environment as that this material is not allowed to enter the human food supply.

Rendering is virtually never appropriate for animals euthanized with a chemical method, such as pentobarbital.^{2, 3} Table 1 shows the formulation for the euthanasia product versus the human medication product.^{5,6} The two things to take notice of are the active ingredient concentration and the dye that is added to the euthanasia product. The preservative in the euthanasia product is added as the vial is a multiuse container, while the human medication version is preservative free as it is filled under aseptic conditions.

Why the Letter B?

Normally the carcasses are rendered by the slaughter and meat processing facilities, farmer, veterinarian, or auction yard using non poisonous methods.⁷ Rendering means the animal may become food, especially pet food. The fat obtained can be used as raw material in making grease, animal feed, soap, candles, biodiesel, and as a feed-stock for the chemical industry. Tallow (mainly triglycerides) is an important raw material in the steel rolling industry, providing lubrication when compressing steel sheets. Other products include leather, blood, and bone meal.

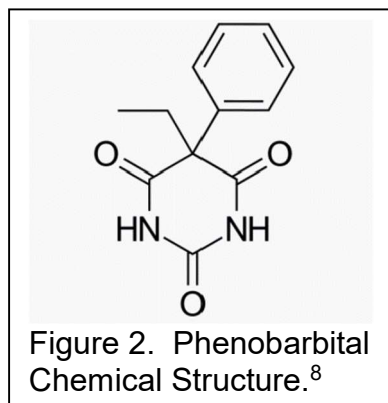


Figure 2. Phenobarbital Chemical Structure.⁸

In this case, the barbital (EUTHASOL® (pentobarbital sodium and phenytoin sodium)) is given as an overdose which acts quickly. This means the barbital has not been metabolized / excreted and can have a high localized concentration. As a result, the barbital can be toxic and has been known to kill pets via pet food, and scavengers (environmental contamination) by a process

called relay toxicosis, also known as secondary poisoning (see Figure 3).⁹ The rendering process does not inactivate pentobarbital. For this reason, barbiturate euthanized animals other than pets require the orange “B” 4” tall on the forehead. These carcasses are then buried or incinerated (See Figure 4).^{1, 10} This is California letter law since July 30, 2020.¹⁰

An example of indiscriminate poisoning that has led to changes is rat poison. The anticoagulated warfarin used to be dispensed in open trays as pellets (the primary poison to target and non-target animals). Today it is sold as a block that requires the rodent to go through a maze to get to the bait. That prevents the non-target primary poisoning for birds, cats and dogs, but does not prevent secondary poisoning to predators and scavengers.

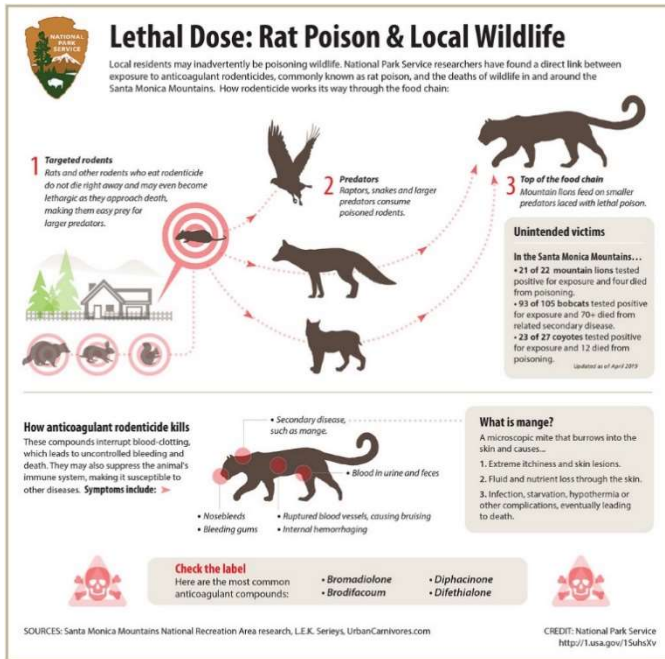


Figure 3. Image Showing Relay Toxicity.⁹

Human Euthanasia Comparison

Interestingly, human euthanasia in California has to be self-administered and with the death certificate hiding the fact euthanasia (suicide) was involved. Under The California End of Life Option Act (ELOA)(effective date June 9, 2016), a suicide that follows a legal procedure will not be recorded as a suicide on the death certificate, with the underlying illness recorded as the cause of death.¹¹ This is done for life insurance collectability since suicide will void benefit payout. Body disposal is by burial or cremation. Organ donations can be tricky not only from the poison, but the organ donor has some health issues that allowed euthanasia to be allowed.

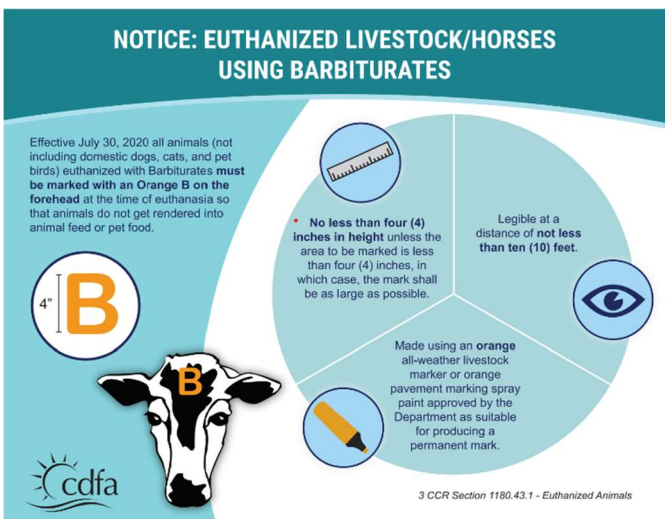


Figure 4. Image Showing the Orange B Letter on the Forehead.¹

Table 1. Euthanasia Solution Formulation Versus a Non Euthanasia Medication ^{5,6}			
Use for	Dogs (off label)	Human	Comment
Trade Name	Euthasol, Beuthanasia-D	Nembutal	
Indication	Euthanasia	Insomnia	
Active ingredients per 1 mL	390 mg pentobarbital sodium (barbituric acid derivative), 50 mg phenytoin sodium	50 mg pentobarbital sodium	Synergic effect Euthasol is a class III DEA controlled drug. Pentobarbital is a schedule II drug. In human 2 to 10 grams will kill you (human) in 30 minutes. Phenytoin in rat Intravenous LD 50 is 96 mg/kg YY
Inactive ingredients per 1 mL	10% ethyl alcohol, 18% propylene glycol, 0.003688 mg rhodamine B	10% alcohol 40% v/v Propylene glycol	
Preservative	2% benzyl alcohol	None	
pH balance	Sodium hydroxide and / or hydrochloric acid	Approx. 9.5 with hydrochloric acid and/or sodium hydroxide	
Color	Blue	N/A	The color differentiates end use.
Dose	1 mL per 10 pounds body weight for dogs (at 390 mg/mL sodium pentobarbital)	150 to 200 mg sodium pentobarbital as a single dose for adult	See <u>Nembutal</u> package insert for toxicology for a number of similar class drugs.

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Review of Dr. Marya Lieberman's "Got Fakes? Paper Microfluidics and the Hunt for Bad Quality Medicines" WCC Meeting on May 4, 2024.

By Laurel Ward

Dr. Lieberman, a chemistry professor at the University of Notre Dame, brought to light the plight of fake and substandard drugs on human life, especially in low- and middle-income countries. She reported that the World Health Organization found that ~10-12% of drugs that are marketed in low- and middle-income countries failed quality standard testing. Because of this, in 2010 Dr Lieberman started working with the Ampath Center in Kenya and started a collaboration with people in the healthcare industry there. We learned that these products could fall into one or both categories of a falsified product (one that is misrepresenting what it is or who made it)[editor note: misbranding is one of the reasons that the US FDA can seize a product] and substandard product (one that doesn't meet one or more of its quality standards)[editor note: term is out of specification (OOS)].

There is a challenge faced in low to middle income countries with sufficiently stocked quality control testing laboratories, and with an insufficient educated workforce. Because of this, anything that Dr. Lieberman's research would produce needed to be from readily available low-cost materials, and easily trainable and interpretable to others in their pharmacies and with their law enforcement. A simple solution was found in developing a paper analytical device (PAD), based on previous research, to screen drugs. The PAD consists of a piece of heavy chromatography paper with dried reagents stored in channels. To run the experiment no special reagents are needed, the sample is added in dry, powdered form and used with water to run the samples along the lanes, and the sample reacts with the reagents to cause color changes. These complex bar codes now allow for identification of 60 drugs whose quality is of concern. This inventive solution allowed for a more affordable, compact, and easily transportable solution to the drug testing problem Dr. Lieberman was trying to solve, but she wasn't satisfied with just publishing a paper as proof of her work, she wanted this to go out into the world and make an impact for the people she had met and collaborated with. To do this she needed to solve the problem of needing well-trained staff to interpret these PAD devices. While training with inspectors seemed to work out well with a 93% accuracy rate for their interpretation, that took time and would only be able to spread so far within these communities.

So, what did Dr. Lieberman do? She reached out and decided to collaborate and build more partnerships. This time with a computer scientist, who trained a neural net to read and interpret the cards with a 97% accuracy rate. From this they were able to build an app for smart phones to interpret these cards, making it easier and more accessible to use for everyone.

As a bonus --and first time ever in a WCC meeting-- we toured Dr. Lieberman's lab and got to see how the cards and app that was developed for its interpretation worked. Dr. Lieberman's work has truly made an impact and is currently spreading not just in developing countries but is now being looked at by law enforcement here as well. This talk showed the power of collaboration and proves the proverb "Necessity is the mother of invention".

She demonstrated that passion and collaboration are the hallmarks of success both personally and professionally. Dr. Lieberman's work is known worldwide, as shown by collaborators in Kenya, Tanzania, Malawi, Ethiopia, Cameroon, Palestine, and Bangladesh. This work received coverage by numerous news outlets, including Bloomberg News, Chemical and Engineering News, the Voice of America, and BBC Worldwide.

American Chemical Society ACS Fall 2024 Meeting in Denver, Colorado, August 18 – 22, 2024

Jim Postma, Bryan Balazs, Marinda Wu, Atefeh Taheri, Michael Cheng, Patrick Lee, Alex Madonik, Sheila Kanodia, Donald MacLean

Compiled by Jim Postma

Format and comments by Donald MacLean

Proof edited by Linda Wraxall

The biggest news to emerge from the Denver meeting was the ChemLuminary Award announcement of the California Section for the Outstanding Performance in the Very Large Size Category. This recognizes the activities of the Section in 2023 under the leadership of Atefeh Taheri, who unfortunately couldn't be present to accept the Award, so all of our Councilors had to mount the stage to accept.

The California Section also won ChemLuminary recognition for its participation in the U.S. National Chemistry Olympiad (led by Eileen Nottoli and assisted by Fanny Fausto and Julie Mason) and for an Outstanding Local Section Industry Event, the Bay Area Chemistry Symposium.

Other big news for the Section was the induction of Neal Byington as an ACS Fellow.

Although Attila Pavlath has relocated to Atlanta, he joined the California Section at the Council meeting on Wednesday which was his 104th ACS Council meeting. It was good to see him!

Actions of the Council

Election Results: Elected Committees of Council

The Council elected Donna Friedman, Matthew Grandbois, Diane Grob Schmidt, and Kimberly Woznack for three-year terms (2025 – 2027) on the Council Policy Committee (CPC). Sheila Murphy was elected for a two-year term from 2025 – 2026 to fill the unexpired term of Jeanette Van Emon, who was elected to the ACS Board of Directors.

The Council elected Allison Aldridge, Mary Engelman, Katherine Johnson, Daniel Rabinovich, and Brian Mathes for three-year terms (2025 – 2027) on the Committee on Committees (ConC).

The Council elected Peter Dorhout, Holly Davis, Kevin Edgar, Donovan Porterfield for three-year terms (2025 – 2027) on the Committee on Nominations and Elections (N&E).

Highlights from Committee Reports and Key Actions

Council approved the Petition for Global Representation on Council. This petition allows for the creation of Global Electoral Zones for the election of Councilors by ACS members living outside the territory of existing Local Sections. Councilors elected by Zones plus

Councilors elected by Local Sections will be set to 4 times the number elected by the Divisions.

Council approved the Petition to Amend the Name of the Committee on Technician Affairs (CTA) to the Committee on Chemical Technical Professionals (CTP). This change recognizes the fact that the term “technician” does not adequately reflect the variety of titles used for these positions across the broader chemical enterprise.

Council approved continuance of the Committees on Ethics; Nomenclature, Terminology and Symbols; and Project SEED and, subject to the concurrence by the ACS Board of Directors, the Committees on Chemical Safety; Chemistry and Public Affairs; Community Activities; Minority Affairs; Professional Training; Science; Senior Chemists; Women Chemists; and Younger Chemists.

Council approved the Academic Professional Guidelines, to reflect the shared responsibility and accountability with the academic institution, faculty, and other mentors in creating a safe environment. It also approved the Chemical Professional’s Code of Conduct.

Council approved the creation of the following International Chemical Sciences Chapters, subject to the concurrence of the ACS Board of Directors: Bangladesh, East and Northeast India, and West India.

The Committee on Constitution and Bylaws (C&B) reported the certification of bylaws for a total of 11 units with five Local Sections: Columbus, Permian Basin, Inland Northwest, Midland, and Pensacola; three Divisions: Divisions of Colloid and Surface Chemistry (COLL), Environmental Chemistry (ENVR), and Biochemistry and Chemical Biology (BIOL); and three International Chemical Sciences Chapters: Switzerland, Egypt, and Guangdong, China.

The Committee on Younger Chemists (YCC), in celebration of their 50th anniversary, encourage early career chemists to join ACS. Through September, new members can join ACS for a 50% discount off their first year of annual dues by using discount code YCC24 when joining online.

Resolutions

The Council passed several resolutions:

- In memory of deceased Councilors;
- In sincere appreciation of the Colorado Section, host Section for the ACS fall 2024 meeting, the Divisional program chairs, symposium organizers, and ACS staff for the planning and execution of the meeting;
- In appreciation of the outgoing Chair of Council, Mary K. Carroll.

The ACS Spring 2025 meeting will be held in San Diego, CA from March 23-27, 2025.

The ACS Board of Directors also met in Executive Session while in Denver. For a report on this and more details on the above issues, see [Councilor Talking Points - American Chemical Society \(acs.org\)](#)

Cal ACS Councilor Reports:

Bryan Balazs (MAC, Membership Affairs):

The Committee on Membership Affairs met in Denver to analyze the latest trends in ACS membership, consider new pricing strategies for certain demographics such as newer (younger) members, and to begin the work on the annual update of the Schedule of Dues and Benefits that is approved by ACS Council at each Spring National Meeting. While the number of dues-paying individuals (Members, Student Members, and Society Affiliates) remains steady after experiencing a drop during the Covid pandemic, the number of Community Associates continues to grow, to over 100,000 as of this past July. The total ACS global community is now over 200,000 individuals all over the world. MAC was encouraged by the recent uptick in Student Members, but there are some areas of continued concern such as the decline in ACS members working in industry. As of now, it is anticipated that the 2025 and 2026 dues will remain the same as in 2024.

Editor Note: See the editorial in this issue for local section numbers for the period since 2017. This includes the new membership categories numbers and how many participated in the local elections. My editorial expresses the concern that the declining membership numbers are due to industrial members not renewing their subscriptions.

Marinda Wu (Past President, Ex-Officio Councilor):

1) At the Fall National ACS meeting in Denver, the CACS (Chinese American Chemical Society) organized a 3-day ACS Presidential Symposium entitled “Achievements in Elevating the Chemistry Enterprise: Advancements in Energy Transition and Smart Materials.” 66 speakers representing industry, academia, government labs, and entrepreneurs in interdisciplinary areas of research were invited to cover research advancements in energy efficiency, waste management and climate change. Two interactive panel discussions discussed innovative solutions for energy sustainability and goals of net zero emissions and a circular economy. Excellent state of the art discussions.

2) The CACS Banquet at the Fall National ACS meeting sold out early with a maximum of about 75 attending. I moderated a successful inaugural Fireside Chat between Prof. Zhenan Bao from Stanford (Keynote Kavli Lecture and 2021 CACS Outstanding Achievement Award winner) and Prof. Yun Hang Hu from Michigan Technological University (2024 CACS Outstanding Achievement Award winner). Other 2024 CACS Award winners were announced including [Dr. Dupeng Liu](#) of CALACS winning one of the 2024 CACS Rising Star Awards!

3) CEPA (Committee of Economic and Professional Affairs) celebrated its 30th Anniversary at the ACS Denver meeting. I was honored to serve as CEPA Chair from 2003-2005. Current CEPA members and ACS Career Consultants and past CEPA Chairs were honored by remarks from the CEPA Chair, Dr. John Gavenonis and ACS President Mary Carroll.

4) Statistics from the Denver ACS meeting for the Career Navigator Live! at the Expo included the following: 338 Personal Career Consultations (the most ever!), Career Pathways Workshops: 35 workshops with 1219 attendees.

Atefeh Taheri (WCC, Women Chemists Committee):

As a councilor for the California Section of the American Chemical Society (ACS) and a member of the ACS Women Chemists Committee (WCC), I had the privilege of participating in the ACS Fall Meeting 2024 in Denver, Colorado. I arrived on Friday evening and spent the weekend engaging with my WCC colleagues, where we focused on ongoing efforts to support diversity, equity, inclusion, and respect (DEIR) within the field of chemistry. This time in Denver was an opportunity to connect with both new and familiar faces, strengthening our shared commitment to these values.

One of the highlights of my participation was presenting at the ACS Pride session. This session provided a platform to discuss the progress and challenges faced by the LGBTQ+ community in the sciences. Sharing my insights and experiences with fellow attendees was both fulfilling and inspiring, as it emphasized the importance of creating an inclusive environment for all chemists. It was an honor to contribute to this important conversation and to be part of a session that highlights the diversity within our scientific community.

As the WCC liaison for regional meetings and the Association for Women in Science (AWIS), I have been involved in fostering collaboration between our committee and AWIS at both the national and local levels. Our ongoing partnership with the AWIS East Bay chapter has been particularly fruitful, with years of joint initiatives that have strengthened our collective impact in supporting women in science.

In this spirit of collaboration, I want to highlight our upcoming joint event with AWIS East Bay on September 21 at the Lawrence Hall of Science. This event will be an excellent opportunity for networking and professional development, and I encourage everyone to attend. The flyer for this event is included in this edition of Vortex, so be sure to check it out for more details.

During my time in Denver, I also attended the District VI meeting in person, where we discussed regional initiatives and strategies for advancing our collective goals. Although I had to fly back home on Tuesday evening, missing the ChemLuminary Awards ceremony, I still felt immense pride and thrill upon learning that we won the award for Outstanding Performance by a Local Section. As the 2023 chair of the California Section, I had the responsibility of writing the annual report, which captured the hard work and

achievements of our section throughout the year. This recognition is a testament to the collective excellence and dedication of our members in 2023.

Balancing my professional commitments with being away from my family was challenging, especially since this was my first time away from my infant son. Four nights felt particularly long, but I managed to stay connected by participating virtually in the council meeting the morning after I returned home. Despite the distance, I was able to contribute to important discussions and maintain my involvement.

Reflecting on my participation in the ACS Fall Meeting 2024, I am filled with pride and gratitude for the incredible work we have accomplished together. My roles within the WCC allowed me to contribute meaningfully to our efforts in regional meetings, industry collaboration, and partnerships with organizations like AWIS. I look forward to continuing our efforts and building on the success we have achieved.

Michael Cheng (Project SEED):

1. New SEED programs in Nebraska, Delaware, Kansas, Virginia
2. There were 1684 applications in 2024; resulted in 371 students in 55 sites; 7 fewer sites than in 2023
3. \$1.45 million in stipends; \$197.5 thousand in scholarships for 2024
4. Coordinators can view students' attendance records to SEED required events
5. Payments to local sections faster, due to the use of a contractor in disbursing funds
6. No major initiative and/or task force formulated; major efforts seem to be expansion into SEED "deserts".

Patrick Lee (CCPA, Committee on Chemistry and Public Affairs):

This was the last CCPA meeting at the ACS meeting for Mick Hurrey as chair of the committee. He served his term limits, and the committee will have a new chair next year. He recently wrote a piece on C&EN about trust in science: <https://cen.acs.org/acs-news/comment/Comment-Trust-Science-grants-aim/102/i15>

There was a subcommittee report regarding Policy, Fellowship, and Member Engagement. Each subcommittee member reported on progress made towards each of the subcommittee goals for the year and each objective was rated as green/yellow/red depending on whether progress has been made, need more help, or if it should be stopped.

Members from this committee contributed to policy statements for Energy/Fracking, Innovation and Entrepreneurship, as well as Artificial Intelligence. The members here collaborated with other committees for the statement edits.

2025 will mark the 50th anniversary of the ACS Policy Fellowship program. This will be celebrated during the Fall 2025 meeting in Washington DC.

The committee also received a report from our ConC liaison (Dan Rabinovich) and saw increased interest in ACS members wanting to participate in various committees. For those people who are not assigned and members of the California section, Patrick requested that these names be forwarded to him as potential volunteers for the section.

Alex Madonik (Committee on Meetings and Expositions, M&E; Regional Meetings Subcommittee)

I attended the Regional Meetings Subcommittee and the business meeting of M&E remotely on Saturday (August 17th) before flying to Denver on Sunday in time to attend the District VI Councilor Caucus in person. M&E presented two ChemLuminary Awards for Regional Meetings (SERMACS, hosted by the Puerto Rico Local Section in 2022, and SWRM, hosted by the Oklahoma Local Section in 2023). Starting in 2025, the RM Subcommittee proposes to offer up to three ChemLuminary Awards, one for outstanding meetings in the small/medium category, one for outstanding meetings in the large/very large category, and one for the most Innovative Program at a Regional Meeting.

As the liaison to the WRM board, I reported briefly to the RM Subcommittee on the status of WRM 2025.

In February 2025, M&E will offer in-person training to Regional Meeting organizers, hosted by the ACS HQ in Washington, DC.

An interactive Regional Meeting/Local Section map is now live at <https://public.tableau.com/app/profile/data.science.and.engineering5403/viz/ACSRegionalMap/DistrictMap>

The Future of Meetings initiative continues to test strategies for improving the meeting participant experience while reducing the footprint of the meetings. Hybrid/recorded sessions will be discontinued, but virtual sessions will be expanded to accommodate participants from around the world. Collaborative programming by Divisions will be strongly encouraged, and some sessions will be allocated to “hot topics” with a shorter lead-time.

Chemistry Nobel Laureate Frances Arnolds’ opening presentation at the C&EN Talented 12 Symposium on Monday morning was a true inspiration.

I visited the Expo both Monday and Tuesday and spoke with numerous vendors to get their feedback and to explore potential interest in exhibiting at WRM 2025 next October in San Jose.

Needless to say, the entire Cal ACS delegation was thrilled to go on stage to accept the final ChemLuminary Award on Tuesday evening, for Outstanding Performance by a Very Large Local Section.

Sheila Kanodia (Committee on Ethics, ETHX):

New vision and mission for the committee after the strategic planning meeting in May 2024.

ETHX VISION: Enabling Trust, Honesty and Integrity for Chemistry and Society {E.T.H.I.C. S.}

ETHX MISSION: Promoting professional conduct through awareness, education and recognition.

The Committee has five subcommittees, and I am a member of DEIRB [B is for belonging] and a new sub-committee is added for communications and marketing.

We are working on nine goals {coming from the strategy planning meeting in May; 3 missions each with three goals, focus is on education, awareness and engagement.) The work will be completed by the sub-committees. A project matrix has been prepared, a tool to help the sub-committees evaluate the consistency with the strategic plan, vision & mission of ETHX.

We are rebranding and will have a new email address and website url effective 10/01/2024. We will also be implementing a social media campaign and developing swag in the near future.

We participated in Committee Row during Sci-Mix with a high level of traffic.

The committee discussed the Department of Homeland Security Report on Reducing the Risks at the Intersection of Artificial Intelligence and Chemical, Biological, Radiological, and Nuclear Threats [April 26, 2024]

Our 20th Anniversary is coming up in 2026 and will be celebrated during the Fall ACS meeting.

Groups interested in programming relevant to the work of the committee should contact the chair Glenn Larkin and/or LaToya [ACS staff].

ACS Undergraduate Awards for Excellence in Chemical Safety and Ethics were given to 34 students.

The Committee on Ethics' ChemLuminary award for outstanding programming was given to the Chemical Soc. of Washington.

Please check our vibrant website <https://acsethics.org/> for more information.

Jim Postma (C&B, Constitutions and Bylaws):

The Committee on Constitution and Bylaws reported the certification of bylaws for a total of 11 units with five Local Sections: Columbus, Permian Basin, Inland Northwest, Midland,

and Pensacola; three Divisions: Divisions of Colloid and Surface Chemistry (COLL), Environmental Chemistry (ENVR), and Biochemistry and Chemical Biology (BIOL); and three International Chemical Sciences Chapters: Switzerland, Egypt, and Guangdong, China.

Donald MacLean (as editor I format this report and add commentary):

The meeting was a hybrid format, but what was surprising is that only 10% of the attendees were virtual attendees. The crowd's age range was wide, but heavy on young and old, not the bell-shaped curve, or Boltzmann distribution.

The employee workshops were popular, held from Sunday to Wednesday. Preregistration with a refundable \$20 if you show was the norm. An eye opener was the federal jobs workshop which really puts the job seeker in a hopeless mood with all the hoops and the time it takes from qualification test, application, interview(s), background check before you start the job - the lady next to me left in despair after about 20 minutes!

The most popular item this time was the free job photo headshot at the Expo provided by ACS Career Services. I waited at least an hour to get mine. I wonder how many are going to end up being used on Linked In.

The Expo crowd felt young and academic. The free lunch snacking was popular. There were instrument setups, but as is the norm now, there were less hardware displays than in days of old. One surprise was the diminishing publisher numbers hawking their wares as I like going to professional Expos to peruse books and instrument displays. From the exhibitor's good job standpoint, I liked a Japanese company's chemical models display.

The District VI Councilor's meeting held on Sunday, had some interesting information emerge, which was presented by [Bryan Balazs](#). National ACS overall membership is 200K, but only about 100K are actual paying members that fall into the paying tiers that allow for CEN magazine access, voting rights, and being officers. Since the national ACS organization is still financially sound, there was talk about making membership free to all. The conclusion (from a survey) is that if membership was free, we would lose more members as people would value ACS less.