

American Chemical Society		Volume LXXXIII Number 8
California Section		October 2021 Newsletter



Fall – Short but Spectacular

Photo: Fall Mushroom Taken in Germany – by Donald MacLean

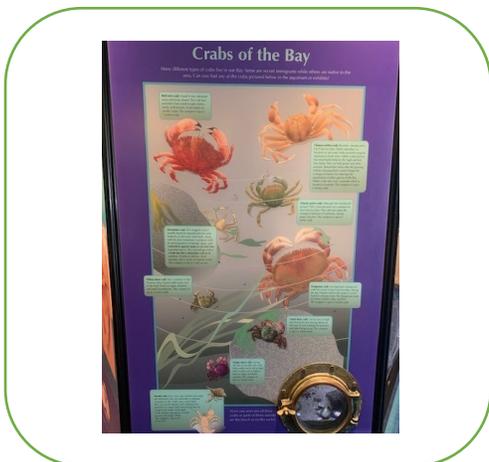


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Top: Municipal Election (modified) - Canva;
 Middle: Mark Frishberg – provided by Lee Latimer;
 Bottom. Crab Cove Display - Donald MacLean

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MAGAZINE OF THE CALIFORNIA SECTION, AMERICAN CHEMICAL SOCIETY

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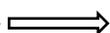
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November / December Topic Contribution Needed:

For November / December Topic, I want to include

1. Vacation pictures
2. Reviews especial tv or books.

Please sent a draft / picture to us by 20th of each month for including to the following month issue.

Send any topics and messages to my email just for *The Vortex*,
donald.maclean.acs@gmail.com and copy office@calacs.org .

Chair's Message – Alicia Taylor



Welcome to fall 2021! First some good news. As of late September, [California is reported to have the lowest rate of Covid cases in the nation](#) and the [Bay Area specifically has even lower rates](#) than the state as a whole. For our members living in

Marin County, Marin has the [highest vaccination rate](#) in the entire state. Here at Cal ACS we are still trying to be very careful – with most of our events still occurring over Zoom, or are outdoor only. Though it may feel like it's far off when we can safely meet indoors, we're definitely on the right trajectory.

In other news, National Chemistry Week (NCW) is coming up soon — October 17-23, 2021! The 2021 theme is "[Fast or Slow...Chemistry](#)

[Makes It Go!](#)". The focus is on the exciting and kinetic world of reaction rates, including how temperature, pressure, concentration, the presence of a catalyst, and more affect how fast or slow a reaction happens. As always, Cal ACS will be participating in NCW. If you are interested in learning more, please contact us at office@calacs.org. Don't forget that the ChemLuminary awards will be presented at a virtual event during NCW. More information will be coming from National ACS in the weeks ahead on how you can attend the awards event.

Also, stay tuned for updates on our fall elections for various officer positions within Cal ACS. If you are interested in running for an officer position, please reach out to office@calacs.org to learn more about our executive committee and officer positions.

Finally, Cal ACS has a number of events coming from our WCC and YCC sections over the next few months. We're excited to present several speakers and networking opportunities over Zoom.

Meeting and Events

National Chemistry Week 2021 – Fast or Slow, Chemistry Make It Go

By Alex Madonik

As students return for the fall semester (in-person or online), California Section is gearing up for public outreach activities. National Chemistry Week is the centerpiece of ACS fall public outreach, with this year's celebration featuring the theme, "Fast or Slow, Chemistry Make It Go." Visit the NCW resource page

<https://www.acs.org/content/acs/en/education/outreach/ncw/educational-resources.html>

for fun, safe, hands-on activities that you can try at home or with your students. Contact your NCW Coordinator if your school or community group would like free copies of the NCW 2021 edition of Celebrating Chemistry – we'll get them to you (ncw-coordinator@sonic.net).



NCW 2021 Illustrated Poem Contest

By Alex Madonik

We invite all K-12 students to participate in the NCW 2021 Illustrated Poem Contest – please share this link with your friends and colleagues, especially any K-12 teachers. The California Section will award prizes to the best entries in each of four categories (grades K-2, 3-5, 6-8, and 9-12), and the winning entries will be forwarded to the ACS National Illustrate Poem Contest. The winning entries will also be featured on the Cal ACS web site. Find the rules and entry form on the Cal ACS NCW 2021 web page:

<https://calacs.org/outreach/national-chemistry-week/ncw-2021-fast-or-slow-chemistry-makes-it-go/>

NCW-Themed Videos

By Alex Madonik

Even if we can't gather in person, we hope you'll try some hands-on activities at home, and even record a video of your favorite reaction. Be sure to follow the safety instructions, and wear safety goggles! Then, upload your video using the link on the Cal ACS NCW 2021 web page. Please contact your NCW Coordinator (ncw-coordinator@sonic.net) if you have questions.

Fall Award Luncheon Postponed

The yearly 50, 60, and 70 year member milestone award luncheon held together with various other section awards is further delayed. The section will re-visit Fall award luncheon planning after Delta wave passes.

Past Due

These are presentations / events that occurred before this Vortex issue and after the previous issue went out.

Women in Energy Leadership Panel

Hosted by the ACS Division of Energy & Fuel (ENFL). This was the first virtual panel discussion from women leaders sharing their career paths and the sustainable development of energy and fuels. The zoom meeting was held on September 24, 2021, 7-8:00 pm (ET). See calacs.org web site for details.

Shout Out – Awards and Announcements

Upcoming Local Section Elections

By Jim Postma

The California Section of the American Chemical Society is seeking nominations for its open officer positions for 2022. Please send nominations, including self-nominations, to jpostma@csuchico.edu.

The open positions are:

Two **Councilor** openings (3-year terms). Councilors represent the Section at National ACS Council meetings twice a year.

One **Chair-Elect** opening (1-year term but the position transitions to the Chair position in 2023 and then the Past-Chair in 2024. Duties include heading the Program Committee and assisting the Chair.

One **Treasurer** position (1-year term).

Four **Member-at-Large** of the Executive Committee openings (2-year terms). There are a total of 6 Member-at Large positions. Three of the open positions are two-year terms; one is a 1-year term.

One **Director-at-Large** opening on the Board of Directors (2-year term). There are 2 Director-at-Large positions. The Board oversees the Section's endowment investments and approves the annual Section budget.

You may send your nominations (including self-nominations) on the form below. Please ensure that your nominee(s) are willing and able to fill the position. Upon nomination, the candidates will be asked to supply a short candidate's statement for the ballot.

Position	Nominee(s)
Councilor	
Chair-Elect	
Treasurer	
Member-at-Large	
Director-at-Large	

James Bryant Conant Award Nominees

By Eileen Nottoli

Ethan Schnell of Dougherty Valley High, and Jonathan Fong of Lowell High in SF were asked to submit their names for the James Bryant Conant Award. I (Eileen Nottoli) will be following up with them to get the nominations in before the November 1 deadline.

High School Tutoring at Galileo

By Eileen Nottoli

Last year, we set up Cal students to tutor Paul Matsumoto's class (Galileo High) and again we received good feedback from the students. Initially, we had reached out to Paul on Olympiad tutoring but he thought his students, who had never participated in the Olympiad, would be intimidated and he asked instead if the Cal students could tutor his students on his course material. Paul asked us to coordinate the tutoring again which was done through a system used within Galileo. The Cal students will use the same system to tutor Paul's kids.

Olympiad Tutoring

By Eileen Nottoli

Last year, CalACS started a pilot program to tutor a few high school students to prepare for the Olympiad. The tutors were chem or chemE students from Cal and they use the Section's Zoom account for the weekly one-hour sessions. The feedback from the students was all favorable (and imagine how much they found it of value since they took the time to respond to my email). This year, Cal students are willing to tutor again (nothing like teaching to learn a subject) and we will invite all students in our Section to participate. I have asked Julie (office secretary) to send an email to our teachers to get an idea of how many students might be interested.

This has the potential to involve students from areas outside the Bay Area.

Senior Chemist Arranging Book Exchange, Virtual Events

By Lee Latimer

The National Senior Chemist Committee is developing a plan to have a book exchange/sale from those of us clearing out personal libraries to those interested in adding to theirs (i.e. grad students and younger chemists). Since this includes me, and I hope some others, the idea is to keep the books out of landfills. Details next month, but offers to assist and any other ideas are appreciated.

Senior Chemist is developing virtual event joint with the Huron Valley Section (aka Ann Arbor, MI) with their senior group around a panel on climate change. This is still developing, especially finding participants from here for the panel. Mary Lynam from HVS got an SCC grant (Senior Chemist Committee) for this.

Finally, the service award virtual event could be one that is managed by a Senior Chemists Committee as a yearly activity. I think we can anticipate a higher participation, and perhaps make it a hybrid event a year from now, but virtual seems more and more likely for this year. But with good weather, an in-person might be able to happen. I'm happy to take it on, and not because I'm a 50 year this year.

Section is Finalist for ChemLuminary Awards

The California Local Section has been selected as a finalist for the following ChemLuminary Award(s):

- Outstanding Local Section Industry Event
- Outstanding Women Chemists Local Section Event
- Outstanding Performance Awards - Large Size Category
- Best New Senior Chemists Activity within a Local Section



Safety is a core value of the American Chemical Society, and it permeates all our actions, activities, and events. Therefore, we will hold the 23rd Annual ChemLuminary Awards ceremony virtually during National Chemistry Week (October 17–23, 2021) on **Thursday, October 21 at 4 pm ET** out of an abundance of caution due to the ongoing pandemic. The ceremony will include a keynote address by Mary K. Engelman, Eastman Chemical (retired), recipient of the 2021 Award for Volunteer Service to the American Chemical Society, and the presentations of awards given by 18 committees of the Society will follow. This year's theme is "ACS Volunteers Catalyze Change," which honors the work of our volunteers to continue to improve people's lives. [Registration \(go to \[www.acs.org/chemluminary\]\(https://www.acs.org/chemluminary\)\)](https://www.acs.org/chemluminary) is complimentary. **Attendees will receive an access code to enter the event.** Please feel free to share the registration link and ad with members of your section.

In Memoriam



Mark D. Frishberg, Ph.D.

1946-2021

Our Councilor, former Chair, ACS Fellow and 50-year ACS member Dr. Mark D. Frishberg passed away on July 8, 2021 at 75 from multiple myeloma in Seattle. Mark was raised around Philadelphia and attended Case Institute of Technology for his B.S. in 1968, followed by a M.S. (1971) and Ph.D. (1973) from Carnegie- Mellon in Organic Chemistry. After graduation Mark and his wife Kathy joined the Tennessee Eastman Division of

Eastman Kodak in Kingsport, TN.

For almost 30 years Mark worked for in Kingsport, then Rochester, NY and then back to Kingsport, all for Tennessee Eastman, then Kodak in Rochester and then back to Kingsport in Eastman Chemicals which had been spun out of Kodak. His career there initially was in the research labs in Kingsport working especially on purine chemistry and synthesis, and then moving into custom manufacturing customer relations and business development. In 2002, Mark retired, and he and Kathy and family moved west to Santa Rosa, CA where he became President of Seres Laboratories, Inc. until 2010. He became a Consultant in Custom Organic Synthesis and also Vice President of Business Development at JenKem Technology, Inc. In his career, Mark contributed to the commercialization of sixteen active pharmaceutical ingredients and medical devices, gave over 150 chemistry/pharmaceutical related presentations in the US, Europe, and Asia, 1981-2002 and holds eight US Patents.

Following the disastrous 2017 Tubbs Wildfire in Santa Rosa where Mark and Kathy lost their home, they relocated to Seattle to be near their daughter.

Mark was recognized with many honors and Awards in his career recognizing his numerous ACS contributions to the Northeast Tennessee, the Rochester and the California local sections, and to the national efforts of the ACS. A particular mark of his contributions to CalACS is shown by the numerous internal awards culminating in the Walter Petersen Award. A listing follows:

ACS Fellow 2015; 3P Award, California Section 2019; 2018 California Local Section Outreach Volunteer of the Year; Walter B. Petersen Award for Outstanding Long Term Service to California Section, 2017; Making a Difference Award, ACS Careers Office, 2016; Salutes to Excellence Awards (ACS Membership Affairs Committee, 2011; California Local Section, 2008; ACS Committee on Public Relations and Communications, 2006); Outstanding Service Awards, Rochester Section, 1994 and Northeast Tennessee Section, 1980; Graduate Teaching Award, Carnegie-Mellon University, 1969; Sigma Xi; Pi Delta Epsilon.

Mark began volunteering for ACS activities in his local section(s) shortly after arriving in Kingsport as the newsletter editor for the NE Tennessee Section and continued well into 2021 as a Councilor for CalACS and longtime editor of national meeting reports of Councilors. In almost 50 years of volunteering he was known for his willingness to take on positions, participate in activities especially demonstrations or career counseling. In his many years of Councilor and

Alternate Councilor for three sections he served on 7 national committees, being an early founder and chair of the YCC. He also was chair of the NE Tennessee Section and Cal ACS. A short listing of his volunteer activities for ACS at many levels is below:

Service in ACS National Offices: Council Policy Committee, Member, 2018-21; Committee on Divisional Activities, Member 2015-18; Committee on Membership Affairs, Member, 2010-11, Committee Associate, 2009; Committee on Constitution and Bylaws, 2008-09; Committee on Local Section Activities, 1992-95, Committee Associate, 1991; Committee on Public Relations and Communications, 1998-2006, Committee Associate, 1996-97; Committee on Younger Chemists, 1978-83, Chair, 1981-83; Professional Programs Planning & Coordinating Committee, 1981-83; Advisory Group for ACS Communications Strategic Plan, 2006-08; Task Force on Membership Retention, 1992-94, 1981-83; Task Force to Evaluate CHEMTECH magazine, 1981.

Service in ACS Offices: *California Section:* Councilor, 2015-23, 2007-11; Alternate Councilor, 2012-14, 2006; Chair, 2014; Chair-Elect, 2013; Past Chair, 2015. *Rochester Section:* Councilor, 1991-95; Alternate Councilor, 1989-90. *Northeast Tennessee Section:* Alternate Councilor 1980-86; Chair 1979; Chair-Elect 1978; Secretary 1977; Treasurer 1976; Newsletter Editor 1974-75. *Professional Relations Division:* Alternate Councilor, 2007-09.

Member: Member ACS since 1968. Alpha Chi Sigma. *ACS Divisions:* Chemical Education; Industrial & Engineering Chemistry; Medicinal Chemistry; Organic Chemistry; Professional Relations; Business Management.

Also: ACS Career Consultant and Workshop Presenter, 2011 to date; California/Silicon Valley Local Sections/AIChE joint Interview Workshop team, 2008 to date; ACS Chemistry Ambassador; Organized and ran YCC-ACS chemical career counseling programs on college campuses, 1978-83.

Several members have submitted comments on Mark's career:

We all remember Mark's modesty and dedication to helping other ACS members. Service to the ACS was deeply rooted in him, as he demonstrated by terms on the CPC and as a California Section Councilor, patiently reporting back on our behalf after every Council meeting. He loved sharing his experience and insights with job seekers at all stages of their careers, and he was equally enthusiastic about public outreach, showing up at school events and festivals whenever he could make it, ready to present demonstrations on almost any chemistry topic. He even walked around the North Bay Science Discovery Day festival with me two weeks after his home in Santa Rosa was destroyed in the Tubbs Fire.

As you know, Mark was dedicated to recruiting the next generation of chemists, and his talent for outreach included audience-pleasing demonstrations for future scientists of all ages. Back in

2011, we took family science night to Hill Middle School in Novato. We were a bit short on liquid nitrogen for making ice cream, but Mark showed up with his own supply to keep us going, and put on a show including roses that shattered in your hands and giant, sausage-shaped green balloons that disappeared into a vat of liquid nitrogen. He was the perfect straight man, complete with protective equipment and a serious expression that belied the spectacle taking place before his eyes.

He also put in a full day at the Bay Area Science Festival's North Bay Science Discovery Day in Santa Rosa in 2018, sharing his never-ending delight with the chemistry of UV-color-changing beads and that year's NCW theme, "Chemistry Is out of This World!" I arrived for the afternoon shift, and Mark was still there at the end of the day to help me pack up.

– Alex Madonik

Mark has been a true champion to promote the mission of ACS and tirelessly worked at many local sections as well as in many committees at national level. Always well dressed and smiling, he was a great listener.

– Bhaskar Venepalli, Civentichem, Inc., Councilor from North Carolina Section, and longtime friend and co-worker of Mark and Lee Latimer

He was a very humble and dedicated person, helping others just because of his kind and generous nature rather than for personal gain.

– Bryan Balazs

Many people remember Mark as an ACS Career Consultant or through his activities in the ACS Division of Business Development and Management. However, I want to highlight an area that was also important to Mark, namely SEED. Mark would volunteer to write up the minutes from the National ACS Meetings by soliciting contributions from Section members who attended the Committee meetings. I would contribute notes from the SEED Open meetings, and this would lead to many discussions about SEED. Although not his main ACS focus, Mark was very supportive of new ideas I had to make the CA Section SEED program even better; he was a great listener. He truly understood the importance of this flagship social outreach program started by CA Section member, Dr. Alan Nixon. With a strong SEED program, it is possible to point students toward college and particularly to STEM majors. No other ACS program does this for economically disadvantaged high school students, and Mark appreciated that the mentor/student experience is very precious.

– Elaine Yamaguchi

Mark was a new member of the Younger Chemists Committee (YCC) in 1978. Mark quickly became a leader in the Chemistry Careers program (also known as “the road show”) that was performed twice per year. YCC was the beginning of a great ACS career."

Mark and I kept in touch over the years. 2017 was a tough year with the Tubbs Fire and the loss of their home. Kathy kept them together, and the move to Washington was positive.

– Al Verstuft

I've known Mark since 1980 when we both worked for Kodak. In 2002, I linked him to the leader of Seres Laboratories in Santa Rosa who needed a president at a time when Mark was leaving Kodak.

The irony is he was allergic to garlic, but located in the heart of food and wine country. It was great fun having him here and no surprise he became involved with CALACS even though it was a long drive from Santa Rosa for Excom meetings. His dedication to ACS and CALACS has been very evident since he moved to Seattle environs but remained representing CalACS as a Councilor.

It has certainly been a great honor being his friend.

– Lee Latimer

Mark was a special friend and ACS colleague who will be sorely missed by many at both our local California Section and the ACS national level.

I met Mark many years ago at one of our national ACS meetings, long before he joined us in California. I helped recruit him to join the ACS Career Consultant group by writing a strong recommendation letter to CEPA (Committee on Economic and Professional Affairs). I felt Mark would make an excellent ACS Career Consultant even though I was unaware of his earlier involvement with the YCC (Younger Chemists Committee) ACS Careers road show.

After Mark joined the ACS Career Consultants group, we enjoyed working together as ACS Career Consultants and Workshop Presenters for many years at the national ACS meetings, and in more recent years, also working together for California Local Section career programs.

When I was ACS President, I invited Mark to give a talk at one of my presidential symposia at the 2013 National ACS Fall Meeting in Indianapolis highlighting various Career Advancement Opportunities. He gave an excellent presentation on **“From the Lab to a Career in Business Development – An Unexpected Career Transition.”** Mark later provided this content as a great book chapter in one of my ACS Symposium Books entitled **“Careers, Entrepreneurship, and Diversity: Challenges and Opportunities in the Global Chemistry Enterprise.”** If you want to learn more about Mark's remarkable career and what he accomplished, take a look.

Mark was a great friend and left us a legacy with warm memories that will live on forever.

– Marinda Wu

Pictures from Alex Madonik at:

<https://calacs.org/tribute-to-mark-frishberg-1946-2021/>

Article and Quotes compiled by Lee Latimer.

EDUCATION, EMPLOYMENT, CAREERS

All That Glitters...? Part 6

By Bill Motzer

Consequences of the Gold Rush's End

By 1852 and 1853 the gold placers that promulgated the 1848-1849 Gold Rush were in significant decline and by 1862 the Rush was essentially over. There were several reasons for this, including: (1) discovery of silver at the Comstock in Virginia City (Nevada Territory) in 1859: many forty-niner placer miners left the played out California gold fields for richer territories. (2) Rise of California's corporate gold mining, resulting in technical innovations such as hydraulic mining and deep underground Mother Lode mining. Both utilized native mercury to recover fine gold via amalgamation. (see *Amalgamating Mercury*, September 2007 Vortex); and (3) The Civil War, which began in April 1861, gave California and San Francisco (SF) considerable Congressional political power because California's gold help finance The Union's war effort. But changes wrought by the Rush's inception and ending linger on to today, including physical and chemical contamination of SF and its Bay.

San Francisco Fill

Between 1848 and 1852 SF's population boomed, growing from fewer than 1,000 to over 35,000, respectively. Therefore, SF, located at the end of a peninsula, began running out of usable land. The most obvious option was to fill in marshy areas to the north and east along the Bay (Figure 1). This fill generally consisted of fine to medium dense to silty sand and clay,

gravel, and debris composed of metals, glass, concrete, and crushed rock. Earlier buried debris included many old and burned abandoned ships whose crews had deserted to the gold fields (Figure 2). Later fire and earthquake debris, and perhaps human remains were included. These unstable debris resulted in liquefaction during earthquakes (e.g., in the Mission District during 1989 Loma Prieta Earthquake; see Figure 3). Figure 4 shows mapped liquefaction zones: compare with Figure 1, noting that these are in fill zones, resulting in building subsidence continuing to the present. A recent example is The Millennium Tower (Figure 5), which had concrete friction_piles placed into and penetrating through unstable fill and young bay mud to be embedded into denser Colma Formation sand.

Finally, in 1854 SF began construction of coal gasification plants, providing its inhabitants with lighting and heating gas. Coal tar residual waste containing polycyclic aromatic hydrocarbons (PAHs) were dumped into nearby unlined pits. Note from Figure 6, that these plants were mostly located in fill areas. Although many PAHs are insoluble in water (e.g., chrysene: $C_{18}H_{12}$) some are soluble (e.g., naphthalene: $C_{10}H_8$). With rising sea and groundwater levels soluble PAHs could pose future environmental hazards.

In the next article, I'll describe additional lingering environmental problems to SF Bay.

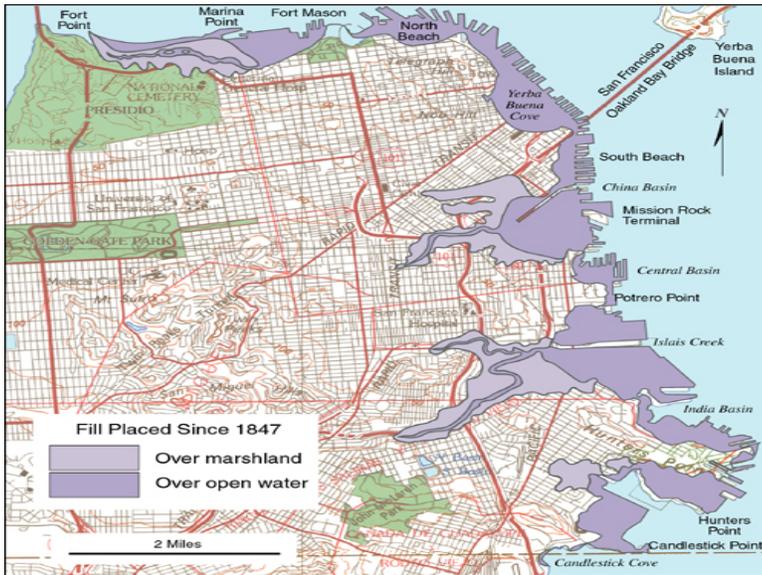


Figure 1: SF fill (purple) placed since 1847. Source: https://geomaps.wr.usgs.gov/sfgeo/liquefaction/image_pages/fill1906.html

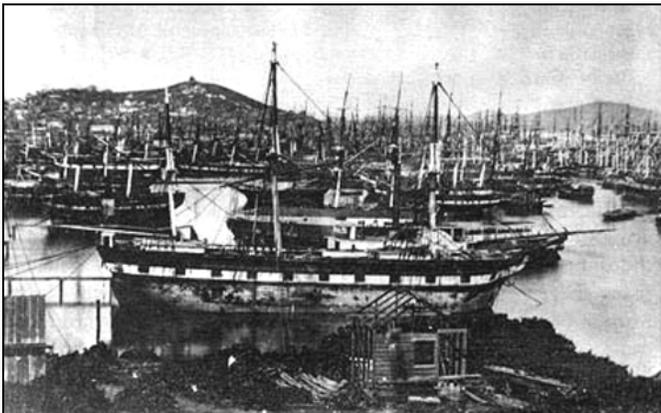


Figure 2: Photo (circa 1851) of abandoned ships in Yerba Buena Cove, SF. Source: <https://www.theguardian.com/artanddesign/picture/2013/aug/19/san-francisco-gold-rush-photography>

Figure 3: Aftermath of liquefaction from the 1989 Loma Prieta Earthquake. Source <https://www.sfgate.com/science/article/Living-in-a-liquefaction-zone-Bay-Area-s-8330101.php#photo-8485499h>



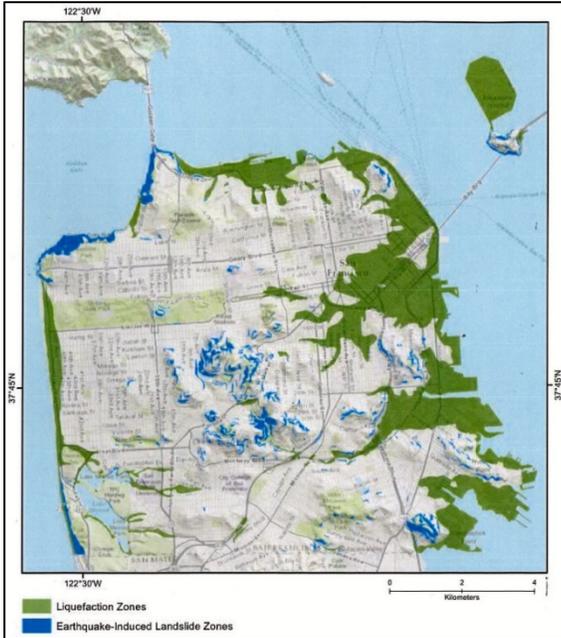


Figure 4: Potential SF liquefaction and landslide zones (compare with Figure 1). Source: Sullivan, R., 2017, *Walk Along the Old Bay Margins in Downtown San Francisco*: Northern California Geological Society (NCGS) Field Trip Guide, 42 p., www.ncgeolsoc.org.



Figure 5: Millennium Tower (301 Mission Street) location in relation to original shoreline and fill area. Building pilings were anchored 80 feet (~24 m) below ground surface (bsg) into packed sand with bedrock at ~250 feet (~76 m) bsg. Subsidence rate was ~40 mm per year for a total of 46 cm by 2018 resulting in a leaning of 36 cm. Dewatering during construction of the adjacent Transbay Center site may have contributed to the subsidence. Source: Sullivan (2017).



Figure 6: Locations of known SF coal gasification plants. From Hatheway, A.W., 1999, *Manufactured Gas In California, 1852–1940: Basis For Remedial Action*: Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management, 146 p. Source:

https://www.pge.com/en_US/about-pge/environment/taking-responsibility/manufactured-gas-plants/sf-adjacent-to-potrero.page.

Teaching Moment

Combining Samples for FTIR Analysis Does Not Speed Up the Identification

By Donald MacLean

Imagine after 20 years you accumulate a lot of unknown chemicals. As unknowns, disposal costs \$55000 per drum, the higher ups decide to fund a team to group classify the unknowns as organic, halogens, metals, acid / base, etc. which will reduce the cost to \$5000 per drum. A team of six Analysts plus a supervisor were brought together to quickly classify what has been generated over many years. We decided to use FTIR as the first line of identification based on organic functional groups along with whether the unknown burned, since most organics burn. Those that could not be classified were tested by XRF for medium and heavy element content. After that a series of wet chemistry tests for anions and cations, including the flame test followed. Those that remained were then tested using NMR. At that point anything that could not be figured out were put on the bench top and more than 20 people provided guesses to conclude things such tree root and stinky liquid used for bank vault security (these were glass sealed and meant to roll off and break when the bank vault integrity was compromised).

The FTIR proved too slow for our supervisor. At our first weekly Friday 4 pm beer drinking get together, our supervisor was complaining about our progress. I thought he was chemist as he was in charge of the stock

room. I realized he was not a chemist after what he proposed. He saw how we used FTIR spectra to classify unknowns, so he proposed to mix 10 unknowns together to speed up the FTIR identification process. A simultaneous “no” came out. At that point our supervisor left us alone until the end.

We cleared a lot of material out, but there were a few that stumped us. At this point we put everything on the counter tops for an open house input and put out an invitation for input. This is where we finally concluded one sample was tree root that was put into a round bottom flask and some kind of extraction was done. In another we knew the sample was acidic so it needed to be neutralized. To speed up the grouping and disposal process, our supervisor kept adding base (could be NaHCO_3 as memory is not so sharp after 25 years) to the unknown. Myself and another person watched as more and more was added to the round bottle flask containing the unknown. It did not bubble or get hot. Then all of the sudden the unknown started to expand. At that point we could not stop the inevitable. I said “it is going to explode”. We ran, it exploded without breaking the glass container. It was funny as no one got hurt. I hated that job.

Nomenclature is the Number One Pharmaceutical Safety Quality Aspect – Part 1 of 2

By Donald MacLean

As a chemist we are used to long nomenclature with N, numbers, halogens, oxo, etc.. N-(4-hydroxyphenyl)acetamide is also known as acetaminophen, paracetamol and Tylenol. To add more confusion, since around 2015 a new descriptive has been added to some medication names, a dash followed by 4 lower case letters. Those names and symbols don't sound like IUPAC either. There are lots of naming conventions out there for different reasons. This article will describe nonproprietary names and connect them with the more familiar IUPAC.

Each drug has an active ingredient or a combination of ingredients that is identified by its nonproprietary or scientific name. The logic behind such a scheme is to avoid confusion and to group exact active ingredient drugs together. So Tylenol, Panadol, and Excedrin all are acetaminophen / paracetamol (Table 1). If drugs used the IUPAC name, the name would be too long, and sounding too similar with di-, tri-, hydroxyl-, N- stems in the name. As a result each drug has alternate nonproprietary name. The organizations that are responsible for nonproprietary names are USAN (United States Adopted Names), INN (International Nonproprietary Names), JAN (Japanese Adopted Names), and BAN (British Adopted Names), etc..

Nonproprietary names consist of 3 parts: a prefix, an infix (sometimes) and a stem.

Prefix: Means nothing; differentiates drug from others in class.

Infix: Used occasionally; further subclassifies.

Stem: Indicates place in nomenclature scheme; drugs with the same stem are related.

As an example, consider sildenafil (Viagra™, Pfizer), vardenafil (Levitra™, Bayer), and tadalafil (Cialis™, Eli Lilly)(Table 2). The -afil stem is formally defined as for PDE5 (phosphodiesterase 5) inhibitors. The -den- infix indicates that sildenafil and vardenafil have similar chemical structures. The prefixes are sil-, var- and tadal-. The name in the parenthesis is the trademark brand name. In some cases, the name does not follow a system as it is grandfathered. Most cases the nonproprietary name is the same worldwide. Tylenol is an exception, where in the US it is known as acetaminophen, whereas in Australia, and Europe it is known as paracetamol.

These days nonproprietary biologic nomenclatures are treated differently than small molecules and is not universally created the same as there is a regulatory overlay to the adopted name recommendation. As an example, the Blood clotting factors might have a nonproprietary name or may go by a generic name. Recently protein nonproprietary names in the USA have an added 4 letter biologic qualifier (BQ). The BQ is assigned by a regulatory agency not a compendial organization or the adopted name organizations. There is debate as to its utility. The logic behind adding a BQ for biologics is the main API (active pharmaceutical ingredient) produced at one site will not be an exact copy, never-the-less from another manufacturer against the drug originator. The formulation (the other materials present not the active ingredient (s)) is usually irrelevant to the nomenclature. Table 3 shows an example of 3 regions where Factor VIIa, FVIII, and FIX are given nonproprietary / generic / scientific names over time. Note the pegylation and fusion protein versions.

Brand Name	Nonproprietary Name				IUPAC Name
	USAN	INN	BAN	JAN	
Tylenol, Panadol, Excedrin	Acetaminophen	Paracetamol	Paracetamol	Acetaminophen	N-(4-hydroxyphenyl)acetamide
Aspirin aka acetylsalicylic acid, ASA	Aspirin	Aspirin	Aspirin	Aspirin	2-acetoxybenzoic acid
Advil, Motrin	Ibuprofen	Ibuprofen	Ibuprofen	Ibuprofen	(RS)-2-(4-(2-Methylpropyl)Phenyl)propanoic acid

Use	Brand Name example	USAN	-Stem	mechanism	comment
Heart and circulation	<i>Tenormin</i>	Atenolol	-olol	β -adrenoreceptor antagonists (Beta Blocker)	<p>-olol (x) β-adrenoreceptor antagonists</p> <p>E.5.2.0 (BAN: beta-adrenoreceptor antagonists) (USAN: beta-blockers (propranolol type))</p> <div style="text-align: center;"> <p>aromat. ring -O-CH₂-CHOH-CH₂-NH-R</p> </div>
High blood pressure	<i>Prinivil, Qbrelis, Zestril</i>	Lisinopril	-pril	angiotensin-converting enzyme inhibitors (ACE)	Related to -prilat
Cholesterol	Zocor	Simvastatin	-vastatin	antihyperlipidaemic substances, HMG CoA reductase inhibitors (cholesterol)	Related to -statin (enzyme inhibitor)

Reference: The use of stems in the selection of International Nonproprietary Names (INN) for pharmaceutical substances, 2011, World Health Organization, Programme on International Nonproprietary Names (INN)

Table 3. Factor VIIa to FIX Examples					
Factor Number	Modification	Brand Name and year approved in USA	Biologic Nonproprietary Name by Regulatory Agency		
			EMA	PMDA	Generic or FDA assigned
Factor VIIa	None	NovoSeven - 1999	Eptacog alfa (activated)	Eptacog alfa (activated) *1	Coagulation Factor VIIa (Recombinant)
		Sevenfact - 2020	Eptacog beta (activated) *4	*2	Coagulation Factor VIIa (Recombinant)-jncw
Factor VIII	None	Advate - 2006	Octacog alfa	Rurioctocog alfa *1	Antihemophilic factor (Recombinant)
		ReFacto AF – 1999	Moroctocog alfa	*2	Antihemophilic factor (Recombinant)
		Xyntha - 2008	Moroctocog alfa	*2	Antihemophilic factor (Recombinant)
		NovoEight - 2013	Turoctocog alfa	Turoctocog Alpha *1	Antihemophilic factor (Recombinant)
		Kovaltry - 2016	Octacog alfa	Octacog beta *1	Antihemophilic factor (Recombinant)
		NUWIK – 2015	Simoctocog alfa	Simoctocog alfa *1	Antihemophilic factor (Recombinant)
		Afstyla - 2016	Lonoctocog alfa	Lonoctocog alfa *1	Antihemophilic factor (Recombinant)
	Fusion	Eloctate (Elocta for EMA) - 2014	Efmoroctocog alfa (recombinant human coagulation factor VIII, Fc fusion protein (rFVIII/Fc))	Efraloctocog alfa *1	Coagulation Factor VIII (Recombinant), Fc Fusion Protein
	Pegylated	Adynovate – 2015	(Adynovi in EMA)– rurioctocog alfa pegol	Rurioctocog alfa pegol *1	Antihemophilic Factor (Recombinant), PEGylated
		Jivi – 2018	damoctocog alfa pegol	Damoctocog alfa pegol *1	antihemophilic factor (recombinant), PEGylated-aucl
		Esperoct - 2019	turoctocog alfa pegol	Turoctocog alfa pegol *1	antihemophilic factor (recombinant), glycopegylated-exei
Factor IX	None	BeneFIX - 1997	nonacog alfa	Nonacog alfa *1	Coagulation Factor IX
		Rixubis - 2013	nonacog gamma	Nonacog gamma *1	Coagulation Factor IX
		Ixinity - 2015	trenonacog alfa *3		Coagulation Factor IX
	Fusion	Alprolix – 2014	Eftrenonacog alfa	Eftrenonacog alfa *1	Coagulation Factor IX (Recombinant), Fc Fusion Protein
		Idelvion - 2016	Albutrepenonacog alfa	Albutrepenonacog alfa *1	Coagulation Factor IX (Recombinant), Albumin Fusion Protein
	Pegylated	Rebinyn (Refixia in EMA) - 2017	nonacog beta pegol	Nonacog beta pegol *1	Coagulation Factor IX (recombinant) GlycoPegylated
*1 Japan adds (genetical recombination) to the recent recombination products. *3 product withdrawn.			*2 unable to determine the name. *4 in regulator review stage.		

Biological Qualifier (BQ)

Since the biosimilars (the “generic” like version of small molecules) there has been discussion about differentiating the originator drug from the follow-ons. In 2013 a biological qualifier system was proposed and adopted by some, then stopped by some who adopted. Each country / region has their own system which makes this confusing. A BQ is an alphabetic code assigned at random to a biological active substance manufactured at a specified site. The scheme is applicable to all biological active substances to which INNs, JAN, or USANs nonproprietary / generic names are used by regulatory agencies such as EMA, PMDA, or FDA.

Biological Qualifiers will be issued for all drug substances of biological medicinal products including biosimilars, innovator products, non-glycosylated and glycosylated proteins. Only exceptions will be vaccines, impure mixtures and complex biologically-extracted products like menotropin or pancreatin to which INNs are not assigned. At this stage it also does not include oligonucleotides, gene or cell therapies.

1. For INN the code consists of four random consonants and an optional two digits as a checksum. The WHO INN will issue the BQ letters with the corresponding checksum, but it is at the discretion of the individual regulatory authority whether the checksum is used as part of the BQ. The form of the BQ may take: •four letters; •four letters followed by the checksum; or •two letters, two digits and two letters, thus mimicking car registration plates to be more memorable. The following fictitious example leads to three possible ways the BQ can be expressed: bxsh, bxsh08, bx08sh
2. For FDA approval the BQ code consists of four random lower case letters after a dash.
3. For PMDA approval, it has gone with its own system, JAN of the Reference Product + “[” + JAN of the Reference Product minus “rDNA,” if any + “Biosimilar” + the order number of the biosimilar product + “

In part 2 will explain how nonproprietary antibodies, vaccine, cell and gene therapy names are assembled.

Reference:

1. Nonproprietary Naming of Biological Products Guidance for Industry, U.S. Department of Health and Human Services, Food and Drug Administration January 2017.
2. Eva Rahman Kabir, Shannon Sherwin Moreino, and Mohammad Kawsar Sharif Siam, The Breakthrough of Biosimilars: A Twist in the Narrative of Biological Therapy, *Biomolecules*, 2019 Sep; 9(9): 410.
3. <https://www.ama-assn.org/about/united-states-adopted-names/united-states-adopted-names-naming-guidelines>
4. www.pmda.jp

Selected Industry News

Compendial Alternatives to Horseshoe Crab Sourced Material for Endotoxin Test

Summary by Donald MacLean

Prior to 1977 a rabbit based pyrogen (fever producing) assay was used as a pharmaceutical product safety test. In 1977 the U.S. Food and Drug Administration (FDA) approved the limulus amebocyte lysate (LAL) for testing drugs, products and devices that come in contact with blood. Today the bacterial endotoxin test is an in-vitro test for the presence of pyrogens mainly produced by gram negative bacteria and is used to ensure the product does not contain endotoxins prior to administration. In the US an new drug is required to be tested in rabbits at least once before approval just to be sure there is not some inherent non-endotoxin pyrogen present. The original indispensable material relied on limulus amebocyte lysate (LAL) or tachypleus amebocyte lysate (TAL) from horseshoe crab (there are 4 horseshoe crab species). There are now recombinant technology alternatives, as well as, a human blood source alternative. LAL detects bacterial toxin (endotoxins) that make their way into medicines. Atlantic horseshoe crab (*Limulus polyphemus*) (see Figure 1) and the Chinese / Japanese horseshoe crab (*Tachypleus tridentatus*) blood are the only known natural sources of LAL / TAL. These crabs are collected and their blood (see Figure 2, blood is blue) is removed from the crab's



pericardium; the crabs are then returned to the water. The practice of collecting blood has an estimated 10 -15% mortality. An alternative to the LAL / TAL has been developed and published in the European Pharmacopeia. In the USP, the recombinant version has been proposed but not adopted. USP <85> and EP 2.6.14 are the relevant USP and Pharm Eur general chapters for LAL based endotoxin test.

Figure 1. Picture Horseshoe Crab. Sourced from

<https://www.publicdomainpictures.net/pictures/180000/velka/horseshoe-crab.jpg>

Since 2003, a recombinant protein substitute for use in the LAL test has been commercially available. Named the recombinant factor C (rFC) assay, it is based on the same Limulus clotting factor C protein, produced by genetically modified insect cells. (The specific factor C sequence used does not necessarily come from the horseshoe crab. EP has adopted the rFC as part of their endotoxin test method, but USP has not. There has been 3 Pharmaceutical Forum articles since 2017 regarding the rFC, but at this time rFC has not been adopted, due to industry pushback, and patent issues. (PF is the preliminary mechanism that USP uses to obtain feedback / public comments to their USP-NF proposals. Anything published in PF is not considered official, unlike USP-NF which would be official). The USP web site and subsequent PF issues have not indicated that the rFC proposal has been cancelled, but the internet has indications that the proposals have been canceled.

USP is holding an open virtual forum on November 15 and 16, 2021 “USP Open Forum on Alternatives to Compendial Reagents used in the Bacterial Endotoxins Test”. See

<https://www.usp.org/events-training/open-forum-alternatives-to-compendial-reagents-used-in-bacterial-endotoxins-test> for information.



Figure 2. Harvested Horseshoe Crab Blood is Blue. The blue is due to copper instead of iron found in red blood. Image source is <https://www.horseshoecrab.org/med/timeline.html>

There are four basic methodologies: #1. Qualitative - gel-clot, and #2 to #4 Quantitative - turbidimetric, chromogenic, and recombinant Factor C.

1. The most basic endotoxin test uses a test tube containing a lysate from horseshoe crab that clots when an added sample contains endotoxin. If the clot stays at the bottom of the test tube after inverting it, the sample is positive for endotoxin.

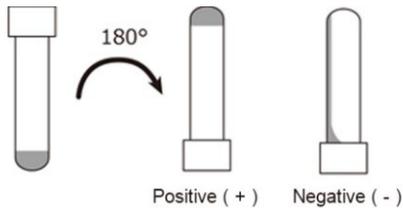
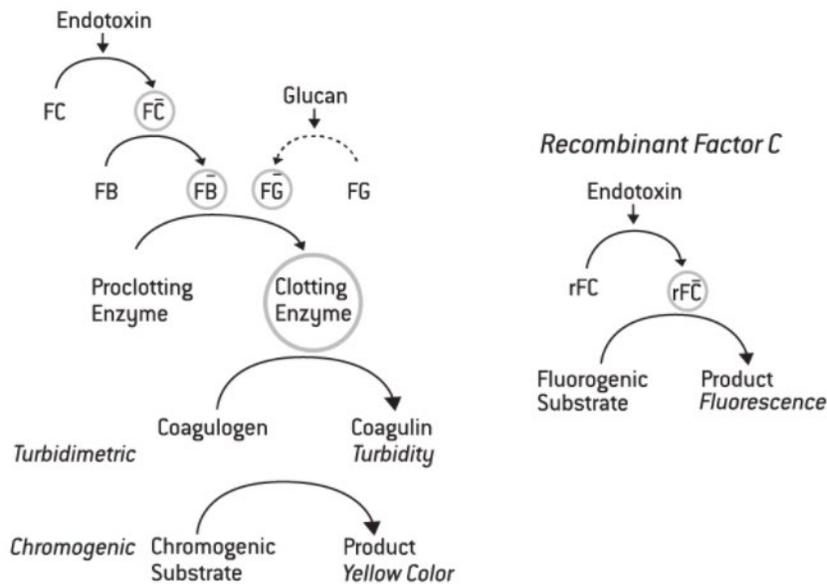


Figure 3: Gel Clot Image. Snip from https://www.wako-chem.co.jp/lal/en/lal_knowledge/about_lal02.html

2. 3 alternatives to the gel clot method are based on turbidity, fluorometric and colorimetric markers. Figure 4 shows the cascade and end product used to obtain turbidity, color, or



fluorescence.

Figure 4. Turbidimetric, Fluorescence and Chromogenic Cascade. Image from Lonza BioScience. The LAL [cascade](#) is also triggered by (1,3)-β-D-[glucan](#), via Factor G. Both bacterial

endotoxins and (1,3)- β -D-glucan are considered [pathogen-associated molecular patterns](#), or PAMPs, substances which elicit inflammatory responses in [mammals](#).

Instead of emulating the whole clotting pathway, rFC tests lets factor C cleave a fluorogenic molecule, so that the sample lights up when endotoxin activates the factor. Since it does not contain factor G, (1,3)- β -D-glucan will not cause [false-positives](#).

Potential New Test: Monocyte Activation Test

Another method that does not require the use of horseshoe crab blood is the Monocyte Activation Test (MAT) or the In-Vitro Pyrogen test. This test method uses human blood rather than horseshoe crab blood. It measures the release of cytokines from these due to the presence of pyrogens, basically mirroring the process by which these toxins cause fever in humans (and rabbits, as in the original pyrogen test). A protocol for the MAT test, using cultured cells, is described in the European Pharmacopeia 2.6.30.. The MAT has an advantage over the LAL/TAL and rFC methods as it can detect non-endotoxin pyrogens. Currently, there are no non-endotoxin pyrogen standards and to date the Monocyte Activation Test has not been able to show a reaction with an authentic non-endotoxin pyrogen.

References:

1. Pharmaceutical Forum 46(5) [Sep-Oct 2020] has <1085.1> Use of Recombinant Reagents in the Bacterial Endotoxins Test - Photometric and Fluorometric Methods Using Recombinantly Derived Reagents, proposed Factor C
2. Pharmaceutical Forum 45 (5) [Sep-Oct 2019] has <85> BACTERIAL ENDOTOXINS TEST, proposed Factor C
3. Pharmaceutical Forum 46 (3) [May-Jun 2020] Application of Recombinant Factor C Reagent for the Detection of Bacterial Endotoxins in Pharmaceutical Products and Comparability to Limulus Amebocyte Lysate
4. Pharmedropa 31.1, Jan 2019, 2.6.32. Test for bacterial endotoxins using recombinant factor C
5. Pharmedropa 31.2, Apr 2019, 5.1.10. Guidelines for using the test for bacterial endotoxins
6. USP <1085> GUIDELINES ON THE ENDOTOXINS TEST, effective date 2020-12-01
7. USP <85> BACTERIAL ENDOTOXINS TEST, effective date 2018-05-01
8. EP 2.6.14. Bacterial endotoxins, effective date Jan 2018
9. EP 2.6.30. Monocyte-activation test, effective date July 2017
10. EP 2.6.32. Test for bacterial endotoxins using recombinant factor C, effective date Jan 2021
11. EP 5.1.10. Guidelines for using the test for bacterial endotoxins, effective date Jan 2021
12. Federal Register, November 4, 1977, Vol. 42. No. 213, p 57749. Notice (42 FR 57749)
13. Ding, JL and B. Ho (2001) A New Era in Pyrogen Testing, Trends in Biotechnology, Vol 19, No { recombinant form of Factor C (rFC)}
14. <https://www.horseshoecrab.org/med/timeline.html>

REVIEWS

Crab Cove Visitor Center– Alameda (Alameda County)

By Donald MacLean

Crab Cove Visitor Center and Aquarium at Crown Memorial State Beach in Alameda is a nice easy place to visit. It is funded by the USACE (US Army Corp of Engineers) and has had restricted hours due to Covid 19. The best time to go is low tide, so the best hours will constantly change. The center has both inside and outside portions. The main 800-gallon aquarium system has sea creatures, use interactive stations for varying age groups to view microscopic animals, build a crab from the inside out, or get a lug worm's view of the mudflats. You'll see depictions of the underwater world of San Francisco Bay. The center has two focus areas, one is Alameda history, the other is interpretive ecology. The exterior part consists of a pond, the bird reserve, and many insect attracting plants.

Interpretive panels are about the Robert W. Crown State Marine Conservation Area, the pond, the plants, the bird sanctuary, wildlife, and the area changes.

For the history buffs, there are six history sections from early days Alameda to present day, with a strong emphasis on the military.

Address: 1252 McKay Ave., Alameda, CA 94501

Fees: Free **Parking:** \$5 per vehicle when kiosk is attended. Parking is difficult.

Glass Beach – Fort Bragg (Mendocino County)

By Donald MacLean



Fort Bragg is coastal town in Mendocino County known for the Skunk Train, former Georgia Pacific Lumber, and fishing harbor. During its heyday glass beach was the city dump. After the town stopped using the ocean as a dump, erosion created an unusual beach, best seen at low tide. Over time the broken bottles created what is now Glass Beach, one of those odd curiosities. Sand and pebbles are replaced with polished colored glass interspersed with the gravel. Instead of walking out on the rocks looking at clams, starfish, and sea anemone, you look at the glass. Interesting outcome. To the north is a railroad

trestle and regular sand.

Figure: Photo showing the colored glass at Glass Beach (photo by Caroline Bothroyd).

Address: W Elm St and Glass Beach Dr., Fort Bragg, CA 95437

Admission: Free **Parking:** Free **Best Time:** Low tide

Fall 2021 262nd ACS NATIONAL MEETING

“The Resilience of Chemistry”

Atlanta, GA, August 22-26, 2021
(Hybrid meeting: Both in-person and virtual)

This report is dedicated to the memory of Mark Frishberg, long-time ACS volunteer, member of several local sections and numerous governance functions, ACS Career Consultant, friend and colleague of many, and the originator of the tradition for these national meeting reports. Mark moved several years ago with his wife Kathy to the Tacoma, WA area to be closer to his daughter, and Mark died July 8, 2021 of multiple myeloma. Mark and his contributions were recognized at the Council meeting associated with the Atlanta national meeting.

Atlanta Meeting Overview

“It was the best of times; it was the worst of times.” This quote from Charles Dickens’ “A Tale of Two Cities” kept echoing in my mind as I arrived in Atlanta for the national meeting. Here we were, after having not met in person since the Fall 2019 National Meeting in San Diego because of the Covid-19 pandemic, yet the Delta variant of the coronavirus continued to rage through areas of the U.S., including the South. I was looking forward to seeing my friends and colleagues and spending nearly a week immersing myself in technical sessions and governance activities, but the hotels, convention center, restaurants and bars seemed strangely quiet where they normally would be teeming with meeting participants and staff. Gone too were the numerous ACS banners, posterboards, shuttle buses, and ubiquitous “Chemistry for Life” logos seen in past meetings. Although the overall meeting registration was over 8,000, the percentage of in-person participants dropped as the meeting approached, no doubt due to concerns about the pandemic surge, and ultimately about 1,500 people attended the meeting in person. Note also that

the meeting venue was officially the Georgia World Congress Center (GWCC) rather than the customary practice of the convention center plus numerous hotels. The meeting followed all CDC and state guidelines for COVID, with health checks each day upon arrival at the GWCC.

This national meeting promised to be different and offer possibilities for the future, and indeed it succeeded on both counts. While almost an order of magnitude smaller than past very large national meetings in terms of attendance, and lacking in-person receptions, most governance activities, and much social interaction, this meeting successfully resumed in-person national meetings while at the same time offering new virtual attendance options for those with travel restrictions, limited funds, schedule constraints, etc. It’s likely that such hybrid formats will be the way of future ACS national meetings, pandemic or not. And, it goes to show that you really can be in two places at once, in a virtual sense, by watching a mixture of real-time and recorded presentations!

Report from the Council Meeting

With all votes by electronic ballot, the Council elected: Donna G. Friedman, Matthew Grandbois,

Fran K. Kravitz, and Louise M. Lawter for a three-year term (2022-2024) on the Council Policy

Committee (CPC), Mary K. Engelman, Malika Jeffries-El, Brian M. Mathes, Susan V. Olesik, and Susan M. Schelble for a three-year term (2022-2024) on the Committee on Committees (ConC), and Allison Aldridge, Holly L. Davis, Peter K. Dorhout, Silvia Ronco, and Martin D. Rudd for a three-year term (2022-2024) on the Committee on Nominations and Elections (N&E).

Council approved the Petition to Amend the Duties of the Committee on Minority Affairs. The Petition was amended on the floor of Council to strike the word 'minority' in Standing Rule VIII, Sec. 1, b, (9). The Board added its approval in its meeting on August 28.

Regarding the CMA topic above, Councilor Alex Madonik added this observation, "A heated discussion arose around what seemed to be a minor change in the duties of the Committee on Minority Affairs. The term "minority" was replaced by "underrepresented and marginalized groups." Some councilors objected to this change, either because they didn't think it was well-defined (despite extensive research and commentary by the DEIR task force) or because they foresaw overlap with the duties of other committees. For my part, I welcome collaboration among committees (and Divisions), because that's where opportunities for effective action are often found."

Board, Committee, and General Meeting Observations

Report on CACS (Chinese American Chemical Society) Symposium at the National ACS Meeting (Marinda Wu): The virtual CACS Symposium "Leadership and Resiliency in the Global Chemistry Enterprise: Celebrating the 40th Anniversary of CACS" on August 23-25 turned out fantastic. See www.cacshq.org for details. The celebration culminated on August 26 with a tribute in memory of CACS founder followed by the 2021 CACS Awards ceremony and a wonderful networking session with students, distinguished scientists, past ACS Presidents and the current ACS President.

The Council (and then the Board) also approved the continuation of the Committee on Environmental Improvement. Also, on the recommendation of the Committee on Economic and Professional Affairs, and with the concurrence of the Council Policy Committee, Council (and then the Board) approved the 10th version of the Professional Employment Guidelines.

President Cheng introduced and led a special discussion on ideas to increase involvement and membership from business and industry. For the last 5 years there has been a steady decrease in industry members within the ACS. This can be attributed to a variety of factors, but there have been ongoing efforts to decrease the cost-related attrition while increasing member value. A number of good suggestions were offered.

Other Council notes from Councilor Patrick Lee: Report by President-Elect Angela Wilson: Courses planned for quantum computing & Artificial Intelligence and Machine Learning for chemists. Report by Chair of Board of Directors: hybrid meeting on recruiting and retaining volunteers - recorded and will be placed on ACS website. Report by the ACS CEO: This Fall meeting is first hybrid meeting, and about 3/4 of attendees are all virtual. Future meetings will likely maintain hybrid format. The ACS is also looking for growth in membership from industry.

Report on ACS Career Consultants Virtual Networking Sessions at the National ACS Meeting (Marinda Wu): A good networking was held via zoom with fellow ACS Career Consultants on August 19 and August 25.

ACS Board of Directors (by Director-at-Large Bryan Balazs): The Board received and discussed reports from its committee on Professional and Member Relations and the Society Committee on Publications. On the recommendations of the Society Committee on Publications, the Board

voted to approve the reappointments of Editors-in-Chief for several ACS journals. On the recommendation of the Committee on Professional and Member Relations, the Board approved a Society nominee for the 2022 National Science Board Public Service Award. The Board received an extensive report from the ACS CEO Dr. Tom Connelly on current issues relating to the Core Value of DEIR, COVID and Return to ACS Offices, Membership; Financials, and on upcoming events and activities. The ACS VP for Philanthropy provided a presentation, "Impact of COVID on Fundraising" during the report. The presidents of CAS and ACS Publications engaged in discussions with the Board on the activities, opportunities and challenges of their respective divisions. The Board heard reports from the Presidential Succession on their current and planned activities for 2021 and 2022.

Committee on Constitution and Bylaws (by C&B member Jim Postma): The Constitution and Bylaws committee meeting was held virtually on Sunday, August 16. Similar to the Spring meeting, there were no Division of Section Bylaws submitted to the Committee, and the committee's discussion pertained to items on the Council's agenda.

Committee on Project SEED (by SEED member Michael Cheng): the Project SEED Executive Committee met on 8/14/2021 with the following highlights:

- As a result of the ACS committees realignment, the members are allowed two three-year terms; associate members one one-year term.
- Outstanding Mentors Award piloted this year – 17 nominations, 7 finalists, 2 winners (Tinoco, University of Puerto Rico; and Volkis, University of Maryland).
- Need "master mentors" to mentor new mentors and potential mentors.
- A task force formed to consider changing the vision/mission of the SEED program.

- 2022 Program will likely to include in-person format; however, the in-person programs need to have a virtual backup plan; and ACS can help.
- ACS SEED will curate/create some program for the 2022 for all SEED students.
- Documents to demonstrate family income is broadened for 2021, as well as for 2022.

Committee on Budget and Finance (by B&F member Bryan Balazs): B&F reviewed reports from ACS Staff on the overall financial performance of the ACS as of June 30, 2021, relative to the projected status in the 2021 budget. Revenue to-date was \$324.4M, and expenses were \$269.4M, yielding an impressive "Net from Operations" of \$55.0M (these funds support numerous activities of the ACS). Overall, the Society is in excellent financial health despite the pandemic, and B&F saw no causes for concern. Also of note was a briefing on the status of the PEVOP effort by B&F (Portfolio Evaluation & Optimization), which is a fresh means of assessing the strength and impact of the many ACS programs, products, and services. This assessment will be at a higher level than in years past, and will measure the ACS offerings relative to the overall ACS goal that they support. The initial rollout of PEVOP is in 2021 with further work in 2022.

Committee on Community Activities (by CCA member Alex Madonik): Under the new rules for ACS committee service, Councilor Alex Madonik will rotate off the CCA at the end of this year. He will continue to serve as a consultant on the NCW 2022 theme team; the theme will be, "Fabulous Fibers; the chemistry of fabrics- Fibras Fabulosas; La Química de las Telas." Alex is writing an article about synthetic spider silk, and the group also heard reports from the other theme teams including the launch of this year's NCW celebration, "Fast or Slow, Chemistry Makes It Go - Rapido o Lento, La Rapidez de la Química." Some of Alex' CCA colleagues participated in a successful in-person public outreach event at the Atlanta

Aquarium, but his attendance was 100% virtual. The two Directors-at-Large in the California Section, Lee Latimer and Bryan Balazs, participated in person at the aquarium outreach event, along with many other members of the ACS Board of Directors.

Committee on Ethics (ETHX, by Councilor Sheila Kanodia): ETHX met virtually on Saturday, 31st July 2021. William Leong, Chair of the Committee initiated a discussion of the concept of "Broadcasting Ethics" for the committee to discuss. "What makes me excited" and "how to convey and spread the excitement". Considering the committee's strategic plan and the associated goals, it culminated with the idea of each member committing to one activity for the year.

Lisa Houston, a guest speaker, spoke regarding the new Strategic Plan (SP) of the ACS, the "change drivers" and a strategy to incorporate change drivers in the committee's activities. After discussion, conclusion was that there is need to revise wording in the SP that would more closely relate to academic and industrial members. Ms. Houston recommended that specific wording be sent to the ACS for discussion.

An article titled "Science is Political" was sent to the committee prior to the meeting for discussion. Glenn Larkin commented that ACS publications should take a more visible role in the discussion of ethical issues.

Chem Luminary Awards: There are no nominations for CL awards from the committee at this time. Outreach through the article to a various ACS newsletters and social media outlets to encourage the development of ethics outreach activities. In preparation for the dissemination Fran Kravitz has identified contacts of 185 local sections to which the article could be sent. The committee recommended that the article be sent to these section officials.

Comments to the ACS Publishing Integrity office: on the disproportionate publication of articles by male chemists. Questions about demographic data concerning female authors and the reviewing of manuscripts. also comments on the need for data on female editors of journals. ACS is

currently accruing historical demographic data on these and related issues, findings in the near future will be available.

Sarah Mullins also asked whether the PIO serves to adjudicate publication issues involving ethics. Currently the PIO performs the investigation and accrues data, but that final adjudication is the responsibility of journal senior editors.

Progress of ETHX Committee Strategic Goals:

- Goal 1: there has been limited progress in development of products related to ethics due to Covid restrictions at their institutions.
- Goal 2: In PacifiChem ethics related programming, at the Spring 2022 ACS National Meeting there will be symposia on "Open Access" and "Academic Integrity in the Classroom in the Era of Covid"
- Goal 3: Extensive work on the website was completed, meeting the goal of having it running at the end of August, and the site is now live at: <https://acsethics.org>

The participants were separated into 3 Breakout Rooms with the goal that each member develop "one ethics-related activity for the next year".

- Group 1 report: focused on the collaboration of ETHX with other ACS committees, particularly the Young Chemists Committee (YCC), on developing presentations and organizing symposia at regional meetings. Noteworthy topics: "Can we stop racism and prejudice?"
- Group 2 report: 3 potential activities: (1) collaboration with YCC on ethics-related presentations and symposia, (2) develop case studies of ethical situations with lesson plans, and (3) generate Chem Luminary content.
- Group 3 report: meeting with YCC Committee on Aug. 14 to discuss co-sponsorship of ethics-related symposia and activities, and working with others on developing a Meeting Code of Conduct for the Northeast section.

There was also a lively discussion of the relative merits of virtual vs. in-person vs. hybrid meetings for the ACS. After discussion it was decided that it was preferable for individual members of the committee to make their opinions known rather than having a committee recommendation.

Other general notes from Alternate Councilor Fanny Frausto who is filling in for the remainder of Mark Frishberg's Councilor term in 2021: I was looking forward to attending the meeting virtually to see in action how the hybrid meeting would be like. However, work obligations pulled me away and I could not participate in real time - plus the time difference was not ideal. I am glad to have the opportunity to "attend" the recorded sessions

through the month of September. I wish more sessions were available for on demand viewing for those of us who could not dedicate the full time. I look forward to a more accessible hybrid meeting in the Spring, where the time difference will be in the California Section's favor.

General observations from Councilor Patrick Lee: The virtual poster session was not obvious how to attend. Presentations over zoom and over other conferencing methods worked well. It would be nice to have access to recorded talks and if there were marks on the schedule to note if any would be recorded, especially if there are conflicts on schedule.

Looking ahead to the Spring and Fall 2022 national meetings

The ACS national meeting returns to California on March 20-24, 2022 in San Diego, and the overall meeting theme will be "Bonding through Chemistry." The Fall 2022 National Meeting will be August 21-25 in Chicago with the theme of, "Sustainability in a Changing World." For these two national meetings, the registration fees were discussed by the ACS Board of Directors, considering factors such as expected attendance,

value perception by attendees, what some other scientific meetings are charging, and of course the cost of holding the meeting itself. At this time, the discussion still has a bit of uncertainty to it, but I will say that I expect the registration fee structure for 2022 to be similar to the Fall 2021 meeting registration fees. In a nutshell, we are still learning what works in this hybrid meeting world.

By the numbers, and other useful information

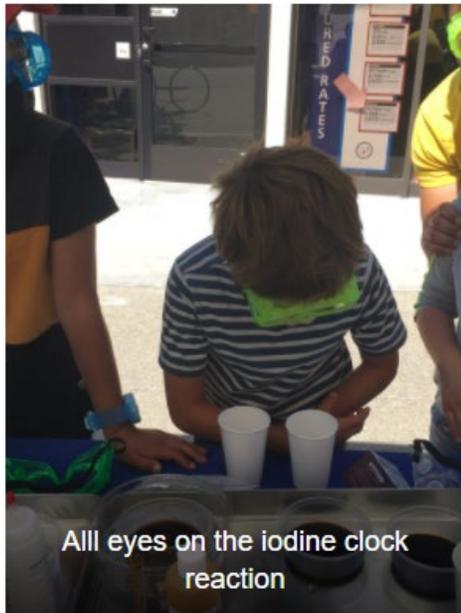
While the "Live" dates of the meeting were Aug. 22-26, the "On-Demand" content is available August 30 through September 30 by logging on through the same links used for the registration/virtual sessions. Ultimately, there were about 8,200 registrants (77% virtual / 23% hybrid), broken down as such: 19% one-day only, 33% first-time, 21% international (representing 69 countries). The program consisted of about 6,700 abstracts, 1,200 oral sessions (74% virtual, 24% hybrid, 2% in-person), 1,400 poster presentations (76% virtual, 24% in-person), and 147 networking events (74% virtual, 24% hybrid, 2% in-person).

One significant aspect at this meeting was the roll-out of the new Membership categories and prices for 2022, an effort years in the making. This new membership structure will contain three "packages": Premium, Standard, and Basic. For current members, the Premium package is similar to what you currently enjoy, and the new membership categories will be available when you renew your ACS membership for 2022. Discounts, such as those for emeritus and retired members, will still apply.

Compiled by Bryan Balazs, Director-at-Large, with input from our other Councilors, Directors, and Past ACS Presidents.

Solano Sidewalk-a-Faire 2021

By Alex Madonik



Thanks to all who helped with a day of hands-on chemistry fun at the [Solano Sidewalk-a-Faire](#) on Sunday, September 12th. [Alex Bruefach](#) was there at 9 AM to help your NCW coordinator with setup. [Michael Cheng](#) joined us at 10 AM, and we had a steady stream of visitors to our booth at the corner of Solano Avenue and Santa Fe Avenue in Albany, CA. They learned that it takes a catalyst to decompose hydrogen peroxide, but the results are impressive (Elephant's Toothpaste). Then, on our signal, they added hydrogen peroxide to the Iodine Clock Reaction and waited eagerly for the sudden color change that gives this reaction its name. We also observed the rapid color change when UV-sensitive beads are exposed to the Sun. In the dark, they quickly revert to their colorless state — unless

they are sitting on ice! In the afternoon, [Hong Yu](#) and [Linda Wraxall](#) arrived to help out, and Michael returned to assist with packing up. [Well, that was fun!](#)



Access [Celebrating Chemistry](#) online for fun, SAFE, hands-on science activities that you can try at home. Contact the [NCW Coordinator](#) for printed copies and NCW souvenirs for your classroom or community group.

Announcing the [NCW 2021 Illustrated Poem Contest](#) for students K – 12! Submit your entry electronically by October 24th; be sure to include the [Entry Form](#).

Stay tuned for some great reaction videos; contact the [NCW Coordinator](#) and your own

video could be featured here!

More science fun during National Chemistry Week: register for [SciFest](#) – USA Science & Engineering Festival.