



ACS

Chemistry for Life™

SCALACS

January/February 2020

A Joint Publication of the Southern California and
San Gorgonio Sections of the American Chemical Society

Southern California Section



**Welcome Incoming Chair
Brian Brady**

See Page 2

**High School Olympiad
March 18-19, 2020
Register On-Line!**

See Page 3

San Gorgonio Section



**Welcome Incoming Chair
Ralph Riggan**

See Page 9



**“Six Decades of Wine Education:
Learning, Teaching, and Enjoying.
2020 Visions of Wines Past, Present
and Future”**

Dr. Ernie Simpson

See Page 10



In stock in Gardena, CA



Spectrum has your lab covered

- Chemicals
- Laboratory Equipment & Supplies
- Glassware & Plasticware
- Gloves & More!

spectrum®
CHEMICAL MFG CORP
Trusted Since 1971

800.772.8786
SpectrumChemical.com

in f



ACS
Chemistry for Life™

SCALACS

A Joint Publication of the
Southern California and San Gorgonio Sections of the
American Chemical Society

Volume LXXV

January/February 2020 Number 1

**SOUTHERN CALIFORNIA
SECTION 2020 OFFICERS**

Chair: Brian Brady

Chair Elect: Thomas Mathew

Secretary/Treasurer: Barbara
Belmont

Councilors: Brian Brady, Robert de
Groot, Veronica Jaramillo, Virgil Lee,
Eleanor Siebert, Barbara Sitzman

**SAN GORGONIO SECTION
2020 OFFICERS**

Chair: Ralph Riggin

Chair-Elect: Jenifer Nalbandian

Secretary: David Srulevitch

Treasurer: Dennis Pederson

Councilors: Eileen DiMauro, Ernie
Simpson

TABLE OF CONTENTS

So. Cal. Chair's Message	2
So. Cal. Meetings & Information	3-5
This Month in Chemical History	6-7
Insights Into IP Law	8
S. G. Chair's Message	9
S. G. Meeting Notice	10-12
Index to Advertisers	13
Chemists' Calendar	bc

SCALACS (ISSN) 0044-7595 is published monthly March through May, September and October; and Bi-monthly January/February and November/December along with a special ballot issue once a year. Published by the Southern California Section of the American Chemical Society at 14934 South Figueroa Street, Gardena CA 90248. Subscription price is \$12.00/year. Make checks payable to Southern California Section, ACS. Second Class postage paid at Gardena, CA 90247, email: office@scalacs.org.

ADVERTISERS: Advertising rates on application. Mail COPY, CONTRACTS and CHECKS to Southern California Section, ACS, 14934 South Figueroa Street, Gardena, CA 90248.

CONTRIBUTORS: Send all copy to Editor, SCALACS, 14934 South Figueroa Street, Gardena, CA 90248, email: editor@scalacs.org.

POSTMASTER: Send change of address to SCALACS, 14934 South Figueroa Street, Gardena, CA 90248.

Website address: www.scalacs.org

Chair's Message



Greetings. Welcome to 2020 and thank you for electing me as Chair of SCALACS. This section is very active and there are always many great events from which to choose. I was reminded very recently by an award-winning volunteer and outreach coordinator that the best ideas and enthusiasm for activities comes from members, and leaders serve as facilitators to help realize these initiatives. I am looking forward to all the great ideas and plans for events our members will bring to me.

In the past few years our section has initiated some new events; in addition to our usual dinner meetings with speakers on fascinating topics, we have begun to have some pizza fueled events on college campuses with equally captivating speakers. I am planning for our events in 2020 to continue to be a mix of these two kinds of events, or perhaps something even more innovative that our members will create.

One of the challenges of our diverse SCALACS section is the geographic spread of our membership, and the traffic congestion that makes these distances seem longer. I have had members tell me they wanted to participate in an event, but it was too far away. One of my goals this year will be to spread our event venues around, so all our members will have an opportunity to participate in something. If you have a great idea for an event location, please let me know. You can reach me at brian.b.brady@aero.org.

Thanks for your attention. Have a great 2020.

Brian Brady, Chair

Southern California Section



Michael Morgan with the 2019 National Olympiad Team

High School Olympiad

The Southern California Section will hold the High School Chemistry Olympiad on **March 18th and 19th, 2020** at over 35 schools in the Los Angeles area. We will no longer be sending letters to schools. The letter with all the information will be available on our website at https://scalacs.org/?page_id=236.

The test is designed to test a student's knowledge of a wide variety of topics in chemistry. If you know of a school or student that would like to participate, please direct them to our website to download the letter and participation form or to pay with a credit card online at our website. The top scorers on the local exam are nominated to compete in the National Exam which will take place on **April 25th, 2020 at California State University Dominguez Hills**. The top 20 national winners are invited to attend an all expense paid two-week study camp. The top four finalists are then selected to represent the United States at the International Chemistry Olympiad which will be held in Istanbul, Turkey on July 6-15, 2020.

We will recognize the top local students at our Educational Awards Banquet to be held on **May 29, 2020** with monetary awards and certificates. The Banquet will take place at the Mount Saint Mary's University Doheny campus. For more information, please contact Dr. Jerry Delker at delker@earthlink.net or Nancy Paradiso in the Section Office at office@scalacs.org.

Advances in Chemistry Krishna Kallury, Ph.D.

MIGRAINE: Effects on American Population and Recent Trends in its Treatment and Prevention Strategies

Migraine, a primary headache disorder with significant physical, social, and occupational disability, is estimated to affect 36 million Americans. For patients aged 25 to 49 years, migraine is the third leading global cause of years lived with disability. In the nearly 1 in 4 US households affected by migraine, family members reported migraine adversely affected family life as well as social or leisure activities. One in three employed respondents to a pharmaceutical survey indicated they turned down work opportunities, including promotions, owing to migraine. Costs of care and lost productivity associated with migraine are measured in tens of billions of dollars. Despite lifestyle modifications and the availability of acute and preventive pharmacotherapies that may mitigate pain and other symptoms and reduce the frequency of attacks, migraine remains inadequately treated in a significant number of patients.

Migraine is an underdiagnosed and undertreated primary headache disorder characterized by recurrent, painful attacks. Gender differences exist, as migraine occurs up to three times more commonly in women than in men. The disorder tends to run in families and genetics may account for 50% of the risk for migraine. More than 90% of Americans with migraine are unable to work or function normally during an attack.

The economic burden imposed by migraine is substantial:

- In the US, total annual costs (direct and indirect) associated with migraine have been estimated at \$36 billion.
- A study that examined healthcare resource utilization and costs reported both direct and indirect costs of migraine had increased compared to costs from a study conducted a decade earlier.
- As a result of lost work days due to migraine, more than \$13 billion is lost to US employers on an annual basis.

Migraine is classified based on the frequency of headache-days. Patients who experience headache, with or without aura, on fewer than 15 days per month are considered to have episodic migraine. Chronic migraine is characterized by the presence of headache on 15 or more days per month for at least 3 months, with at least eight headaches per month exhibiting features of migraine headache. In a population sample of migraine patients who were followed annually for five years, patients with low- or high-frequency episodic migraine progressed to chronic
(Continued pm Page 5)

Advances in Chemistry (Continued from Page 4)

migraine at a rate of 2.5% per year. Compared with episodic migraine, chronic migraine is associated with greater disease burden, both personal and societal. Patients with chronic migraine also experience higher rates of medical comorbidity (e.g., depression, anxiety, chronic pain).

ACUTE THERAPY

A stratified approach based on headache severity uses nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen as first-line, acute treatments for mild-to-moderate headaches; moderate-to-severe headaches are initially treated with triptans (e.g., sumatriptan, zolmitriptan). For patients with inconsistent symptom patterns or prolonged migraine episodes, a “step care within attack” approach uses a simple analgesic initially, followed by more potent medications for subsequent attacks or later in the same attack if initial treatment is unsuccessful. When use of triptans is precluded, Food and Drug Administration (FDA)-approved dihydroergotamine nasal sprays or injections may be used. Noninvasive neuromodulation devices have been approved by the FDA and may serve as useful adjuncts to more conventional therapies.

PREVENTIVE THERAPY

Preventive therapy is especially important in patients prone to frequent headache; however, nearly half of patients with episodic or chronic migraine who might benefit do not receive preventive therapies. Retrospective analyses of US claims data indicate preventive therapy is a cost-effective intervention compared with no preventive therapy, lowering healthcare costs through decreased use of healthcare resources. A wide variety of pharmacotherapies (40+), both on- and off-label, have been used for migraine prevention, with variable rates of response and severity of adverse events reported across patients. First-line preventive therapies approved by the FDA include propranolol, metoprolol, timolol, divalproex sodium or sodium valproate, topiramate, and botulinum neurotoxin type A (onabotulinumtoxin A). The use of preventive treatments has been mostly serendipitous, as these preventive therapies have other uses and indications and were originally developed for the treatment of disorders other than migraine.

MIGRAINE-SPECIFIC PREVENTIVE THERAPY

Calcitonin gene-related peptide (CGRP) is a 37-amino acid neuropeptide with pro-inflammatory and vasodilatory properties. Localized throughout the trigeminovascular system, CGRP has been implicated in the regulation of brain blood flow and in pain transmission. Evidence of a role for CGRP in the pathogenesis of migraine was provided in early studies that demonstrated its release during acute migraine attacks as well as its ability to trigger migraine-like symptoms when administered to patients with a history of migraine. Unlike other preventive medications, CGRP-based therapies target migraine, as they act to inhibit the trigeminovascular pain pathway.

(Reproduced from Veradigm White Paper by John Farah, Joe Vasey, Alina Bagmanov and Lee Kallenbach, 2019; see this reference for complete details)



This Month in Chemical History

Harold Goldwhite, California State University,
Los Angeles
hgoldwh@calstatela.edu

As I have done in a number of years past I begin my columns for 2020 (Happy New Year to all my readers) with a look back 100 years as seen in the pages of Annual Reports of The Progress of Chemistry for 1920 issued by The Chemical Society of London in 1921. This valuable summary of the work in chemistry judged most significant for the past year is a wonderful resource for a writer on relatively recent history of chemistry. World War 1, the Great War, only ended two years ago and the pace of chemical research has been slow during 1920. This annual report volume is slim; the series regains its bulk before 1914 only around 1925.

I begin with the section on general and physical chemistry, abstracted by W.C.McC. Lewis. Professor Lewis held the Chair in inorganic and physical chemistry at the University of Liverpool and did classic work on the chemistry of colloids. Most of his report, and consequently this column, is in the area of atomistics; it is of considerable significance even today. "The interest aroused in the problem of the structure of crystals by the pioneer work of Laue and the Braggs [research less than a decade earlier HG] has led to an intensive study, in the first instance by Born and later by others, of the mechanics of the lattice, the energy involved in its dissociation into ions, its formation from the elements, and allied problems." Lewis goes on to discuss in detail the work of Born, Lande, Fajans, and Haber and their elaboration of what we now call the Born-Haber cycle involving the parameter U , the lattice energy. Values of U have been calculated by Born for many alkali metal halides and other salts.

Fajans has also calculated the heat of hydration of individual gaseous ions from the experimental heats of hydration of salts. Additionally Born and, separately, Fajans have calculated the electron affinities of the neutral atoms of the halogens. The values for Cl, Br, and I are respectively 116, 87, and 81 kcal./mol. (Note the units used at the time; I grew up in the era of the cal. and kcal. and had to change my thinking to J and kJ. Perhaps a few of my readers had the same experience.)

New ideas on the behavior of metals have developed with quantum theory. F.A. Lindemann (who as Viscount Cherwell was Winston Churchill's principal scientific advisor in World War II) has developed a model for
(Continued on Page 7)

This Month in Chemical History

(Continued from Page 6)

metals that consists of two interleaved lattices, one of ions, the other of electrons. Conductivity of electricity and heat is due to movement of the electron lattice, and that movement is impeded by the vibrations of the ion lattice. As temperature falls, conductivity should consequently increase. "This corresponds with the known supra-conductive state discovered by Onnes in the temperature range of 0 to 3K".

A challenging group of experiments on the ionization potentials of molecules and atoms has led to values for a number of species. For the hydrogen atom results cluster around 14.0 eV; for the nitrogen molecule around 17 eV; and for the oxygen molecule about 15 eV. Argon has an ionization potential around 15 eV.

The relatively new atomic model of Bohr is examined critically. While the free hydrogen atom is probably paramagnetic, why is the hydrogen molecule diamagnetic? Bohr's theory at its simplest would suggest that the hydrogen molecule should be paramagnetic. Oxley suggests that compensation of electronic rotations (by some unexplained mechanism) leads to the observed diamagnetism of the hydrogen molecule. A study of the electric (dipole) moment of the water molecule suggests that the electrons in this molecule are not arranged in rings about the nucleus, but might be better described in some other "spatial arrangement, such as that given by the G. N. Lewis cubical atom model." (!)

Experimental determination of the ionization potential of the helium atom gives a value that is not close to the value calculated by Bohr based on a model that has "a nucleus containing two positive charges with two electrons rotating in the same direction and in the same orbit around the nucleus." The reviewer suggests that this casts "serious doubt upon the utility of the model suggested by Bohr for this case and for all other cases involving more than one electron". I guess we'd all agree with that.

American Research and Testing Inc.

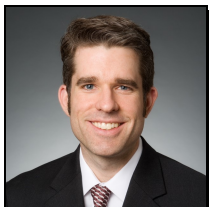
Problem Solving Experts

Chemical consulting and investigation for failure analysis,
quality issues, competitive analysis, and litigation support

Rita R. Boggs, Ph.D.
CEO

Barbara Belmont, M.S.
President

800.538.1655 www.americanresearch.com



Insights Into IP Law

Keith Orso*, Irell & Manella LLP
KOrso@irell.com

Subject matter that is offered for sale or sold more than one year before a patent application is filed qualifies as prior art to the application under the so-called “on sale bar” in patent law. The date one year before the patent application is filed is called “the critical date.” The on-sale bar can be a trap for an unwary inventor seeking to promptly enter a market, as the offer to sell, or the sale of, his or her own invention—if before the critical date—can render the invention unpatentable.

Does the on-sale bar apply even if the inventor has fully conceived of the invention but has not yet made a physical embodiment of the invention at the time of the sale or offer for sale? For example, what if the invention is a new chemical composition that the inventor has conceived but not yet ever actually made in the lab?

The United States Supreme Court addressed this issue two decades ago, and when it did, it began by noting that the primary meaning of the word “invention” in the Patent Act unquestionably refers to the inventor’s conception rather than to a physical embodiment of the idea. The Court also acknowledged that a patent may issue on an invention before the invention has actually been made, noting that it upheld Alexander Graham Bell’s telephone patent in 1888 even though Bell had filed his patent application before constructing a working telephone.

The Court ruled that the on-sale bar applies, even if a physical embodiment of the invention has not yet been made, if the invention was “ready for patenting” at the time of the sale or offer for sale. Such readiness can be established by proof that the inventor had prepared drawings or other descriptions of the invention that were sufficiently specific to enable a person skilled in the relevant art to make the invention.

As one judge has explained, “it is a condition upon an inventor’s right to a patent that he shall not exploit his discovery competitively after it is ready for patenting; he must content himself with secrecy or legal monopoly.”

Accordingly, if an inventor accepts an advance purchase order for an invention when he or she could have filed for a patent based on drawings and descriptions of the thing being sold, the inventor must then file a patent application on the invention within one year of the sale or offer for sale to avoid having his or her own invention counted as prior art.

* The author earned engineering and chemical engineering undergraduate and graduate degrees, and is a patent attorney and partner at the law firm of Irell & Manella LLP. This column does not constitute legal advice and does not necessarily reflect the views of the firm or its clients.



Chair's Message

New Year's greetings to all. As the incoming Chair I wish to express my sincere gratitude to the past chair Ernie Simpson as well as the other executive leaders of the section, in particular Eileen Dimauro, Dennis Pederson, David Srulevitch, Jenifer Nalbandian, and Emily Viggers. Thanks to their tireless effort our Section's 70th anniversary was very successfully celebrated with the July meeting at Big Bear Discovery Center and a great November meeting highlighted by the attendance of ACS President Bonnie Charpentier.

The steady leadership of the Section over the past decade has formed a stable foundation that allows it to provide many useful services for the local community. In early March a "Careers in Chemistry" meeting was well attended by students with a number of professional scientists providing insight as to how their careers developed over time. The International Chemistry Olympiad is held in March each year and provides an opportunity for high school students to test their chemistry knowledge and to compete for modest college scholarships provided by the local section. The top scoring students from each school and a selected high school teacher are recognized at the awards banquet in May. In September the section honors 50, 60 and 70 year ACS members from the section at a recognition luncheon. In October the section coordinates with local colleges and universities by providing resources for celebration of National Chemistry Week. In addition, the Section facilitates participation in Project Seed by identifying research laboratories that can host a Project Seed students as well as soliciting applications from eligible students.

In 2020 the aforementioned activities will be repeated. In February Ernie Simpson will again present his always popular "Wine Talk". Other selected activities will be added, as determined through board planning. Another important goal is to establish and frequently
(Continued on Page 12)

San Gorgonio Section

Section Meeting

**“Six Decades of Wine Education: Learning, Teaching,
and Enjoying.**

2020 Visions of Wines Past, Present and Future”

Dr. Ernie Simpson

Friday, February 21, 2020

3:00 – 5:00 pm

Collins College of Hospitality Management, Bldg. # 79A

Wine Lecture Auditorium, Room # 1263

California State Polytechnic University, Pomona

3801 West Temple Avenue

Pomona, CA 91768-2557

**See the San Gorgonio Section website (sgacs.org) for complete details
and registration form, or send an email to jesimpson@cpp.edu.**

For ten years Dr. Simpson's February Wine Talks at CPP have had several different themes: Using the Periodic Table to identify wines, Sweet wines, Vertical tasting of aged wines, International wines, Wine pairs with food and price comparisons, Wine and beer chemistry, CPP wines and winemakers, etc. All talks have included an overview of wine and wine making as well as detailed descriptions of the chemical composition of grapes and wine, laboratory methods for analysis of grapes and wines, sensory and organoleptic methods used for wine, the role of tannin and other phenolic compounds in wine and some potential health aspects of wine.

This year we will have wine samples from at least four different decades. Everyone will not necessarily taste the same wines. In honor of 2020 vision, we will have a blind tasting of six wine pairs and work in groups to answer several questions: New world or old world (Europe)? What state or country? What region or wine type/grape varietal? Vintage year? Which do you prefer and which is more expensive? Participants will be encouraged to not consume all samples.

(Continued on Page 11)

San Gorgonio Section

Wine Lecture & Tasting (Continued from Page 10)

Biography: Dr. Simpson joined the Chemistry Department at Cal Poly Pomona in 1968 after completing his BS, MS and Ph.D. (Organic Chemistry) at the University of New Mexico and spending one year as a visiting professor at Pomona College. In 1973/74 he was on leave as a visiting Research Associate in the Department of Enology and Viticulture at UC Davis. He is an active member of the American Society for Enology and Viticulture and has served on the editorial board of the society's journal. He has published a California Wine Guide. He is a member of the Society of Wine Educators and the American Wine Society. Dr. Simpson was named as an ACS Fellow in 2012 and in 2013 received the Provost's Award for Excellence in Service at Cal Poly Pomona. He retired from teaching at CPP in 2008. He is on the Board of the Pace Setters, CPP's retired faculty and staff organization. In 2018 he received the E. Ann Nalley Award for volunteer service to the ACS Western Region. He has been one of two San Gorgonio ACS Councilors since 2010 and was Chair-elect/Chair in 2018/19. On Feb. 2, 2019 he was one of 83 Inaugural Class Inductees into the Foothill-Citrus California Basketball Officials Association covering 1949 to 2019.

Wine Tasting: All lecture attendees must be 21 years of age or older.

Reservations: Strongly recommended as space is limited to the first 75 who register. Download the registration form from the San Gorgonio Section website (sgacs.org) or send an email to jesimpson@cpp.edu. Reservations must be prepaid in cash or check payable to Ernie Simpson and mailed to him at 226 Cucamonga Avenue; Claremont, CA 91711-5015. Reservations must be received no later than February 14, 2020.

Cost: \$20 (includes main lecture with wine samples, snacks, crackers and cheese). Make check payable to Ernie Simpson.

For an additional \$25 or a total fee of \$45, a registrant will also receive a RANDOM 750 ml bottle of wine from Dr. Simpson's wine collection. The wine will most likely be a California red, port, or champagne with an original purchase price of between \$25 and \$80. If vintage-dated, it will probably be between 2000 and 2016.

For an additional \$20 or a total fee of \$65, a registrant will have the opportunity to pre-select one bottle from a list of wines with an original purchase price of between \$45 and \$95 that will be provided by Dr. Simpson upon receipt of the fee.

(Continued on Page 12)

San Gorgonio Section

Wine Lecture and Tasting (Continued from Page 11)

All net monies raised by the event will go to the Dr. and Mrs. Simpson Collins College Scholarship.

Disclaimer: Dr. Simpson cannot guarantee the quality (drinkability) of the wines from his collection but to the best of his knowledge they are in sound condition. All sales are final.

Directions: From Interstate 10, take the Kellogg Drive exit. Heading south on Kellogg Drive, stay on the right lane and curve right onto University Drive. Stay on University Drive past 3 stop signs, then turn at the first left (Center Circle Road) up the hill to Kellogg West. From I-57, exit Temple Ave. Go north/west following Cal Poly signs past the lights at Valley Blvd. Turn right onto University Drive. Take the third right (Center Circle Road) up the hill to Kellogg West and the Collins College for Hospitality Management at the south end of the parking lot. A campus map can be found at www.kelloggwest.org, go to locations and points of interest and click on campus map.

Chair's Message (Continued from Page 9)

update a new Local Section Website to provide timely availability of Section information for the members and other interested parties. We will also endeavor to expand Project Seed participation to the extent possible. Additionally I invite more active participation of industrial members in the Section and I also solicit anyone with an interest in serving as part of Section leadership in the future to contact me or any of the other section leaders.

As a new Local Section Chair and a newcomer to California and the San Gorgonio Section, having moved here from the Midwest six years ago, I have a lot to learn and would welcome any suggestions, comments, etc. from members of the section or other interested parties. My email is: rm.riggin@yahoo.com. Feel free to contact me at any time.

Ralph Riggin, Chair

INDEX TO ADVERTISERS

American Research & Testing_____	7
Micron_____	13
Spectrum Chemical_____	ifc

**Our Advertisers support our Section.
Please let them know that you saw their ad in SCALACS!**

SEM - EDS - FTIR - XRD - ESCA - AUGER - DSC - TGA - Metallography

FDA & DEA
Registered



micron inc.
Analytical Service Laboratory

Members of ACS, ASM, MSA/MAS, SAS and TMS

GMP/GLP
Compliant

Experts in Chemistry, Morphology and Structure

www.micronanalytical.com

302- 998-1184

micronanalytical@compuserve.com



"Rats! I thought lanthanoids and actanoids
were gonna be giant robots or something."

**SOUTHERN CALIFORNIA SECTION
AMERICAN CHEMICAL SOCIETY**

14934 S. FIGUEROA STREET
GARDENA, CA 90248

***IMPORTANT
Do Not Delay!***

Contains Dated Meeting Announcement

PERIODICAL

Bi-Section Chemists' Calendar

For more information on these events, please check our website at
www.scalacs.org

February

21 SG Wine Lecture with Dr. Ernie Simpson—see page 10

March

18-19 SC High School Olympiad—Sign up Now! — see page 3

Check our websites for activities:

www.scalacs.org

www.sangorgonio.sites.acs.org