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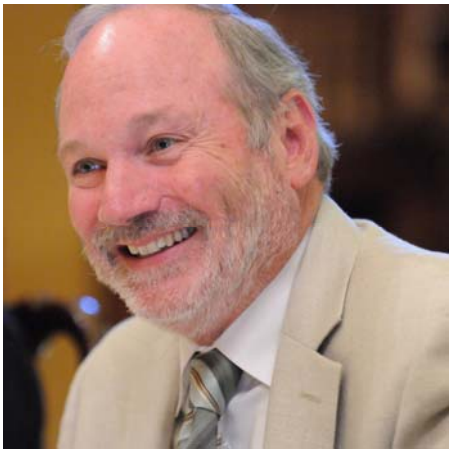
A Joint Publication of the Southern California and
San Gorgonio Sections of the American Chemical Society



Southern California Section
Tolman Award Dinner
Monday, April 25, 2011

Recipient of the 2010 Tolman Medal:
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California Institute of Technology

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Innocent or Guilty: The Role of DNA Analysis

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Riverside
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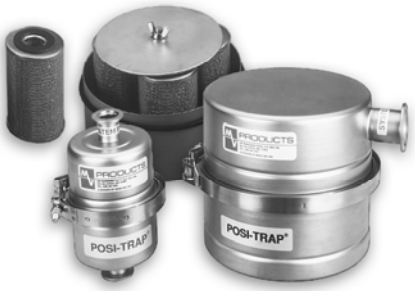

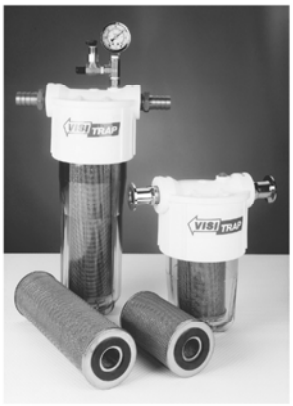

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A Joint Publication of the
Southern **Cal**ifornia, Orange County and San Gorgonio
Sections of the **A**merican **C**hemical **S**ociety

Volume LXIV April 2011 Number 3

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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/Yr. Make checks payable to Southern California Section, ACS. Second Class postage paid at Gardena, CA 90247., e-mail: 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, e-mail: editor@scalacs.org.

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

Southern California Section

Chair's Message

Unless this is first issue of *SCALACS* that you've read, you know that we are celebrating the centennial anniversary of the Southern California Section as well as the International Year of Chemistry, a worldwide celebration of the achievements of chemistry and its contributions to the well-being of humankind, with the tagline: "Chemistry—our life, our future." Four themes are celebrated throughout the year: Water in the Environment, Alternative Energy, Materials, and Health. On April 25th at Caltech, we will be celebrating the achievements of Dennis Dougherty, winner of this year's Tolman Medal. His group's website says that "chemists must play a role in unraveling the great mystery of how the set of processes we call mind emerge from the activity of the organ we call the brain." And they are using their brains as well as the tools of physical organic chemistry to make some headway toward this ultimate goal.

We will return to Pasadena on November 10th -12th with the Western Regional Meeting. The undergraduate program alone looks exciting enough to make you wish you were back in college. Keep an eye out for the full program to be announced later.

One of our goals is to invigorate the vitality of the college clubs so that the ACS student members see that they are a part of something larger than themselves, and that they feel empowered to pursue a career in chemistry to make a positive contribution to their community and to the world. At the February dinner meeting we had two tables of undergraduates, and in March there were more. We've seen students from East Los Angeles College, Pepperdine, UCLA, Cal State Los Angeles, and others. But they didn't get there on their own. In most cases, they traveled together as a club, were brought by their faculty mentors, or encouraged by past or current mentors to attend these meetings. Students can learn how to think about chemistry from a textbook, and how to do chemistry in the laboratory, but the human face of chemistry can be seen at meetings such as these, and they need encouragement to get here. This may help the students commit to using their own brains in unraveling the great mystery we call *chemistry*.

- Joe Khoury, Chair
JKhoury@lacsd.org

Southern California Section

Tolman Award Dinner

Monday, April 25th, 2011

Caltech Athenaeum
Hall of Associates

551 S. Hill Avenue
Pasadena, CA 91106
(626) 395-8200

"Chemistry on the Brain: Understanding the Nicotine Receptor"

Professor Dennis Dougherty, 2010 Tolman Award Recipient

George Grant Hoag Professor of Chemistry,
Division of Chemistry and Chemical Engineering,
California Institute of Technology

6:00 p.m. Check-in & Hosted Social Hour
7:00 p.m. Dinner
8:00 p.m. Presentation

The Award: The Richard C. Tolman Medal is awarded each year by the Southern California Section of the American Chemical Society in recognition of outstanding contributions to chemistry in Southern California. The Tolman Medal recognizes broad accomplishments in chemistry rather than a single fundamental discovery. These contributions may be of several kinds, including seminal research of widely regarded influence, achievements of broad impact in chemical technology, significant contributions to chemical education, and outstanding leadership in science on a national level. To be eligible for the Medal, the recipient must have accomplished a major portion of his or her work while a resident of Southern California.

Abstract: The human brain is the most complex object known to man. It presents daunting challenges at all levels, from the anatomical, to the cellular, to the molecular. Our work seeks to provide a chemical-scale understanding of the molecules of memory, thought, and sensory perception; of Alzheimer's, Parkinson's, and schizophrenia. An area of
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particular interest has been the chemistry of nicotine addiction. The initial chemical event of nicotine addiction involves nicotine binding to and activating acetylcholine (ACh) receptors in the brain. Using the mindset and methodologies of physical organic chemistry, we have probed these complex membrane proteins with a precision and subtlety normally associated with small molecule studies. We have established that the cation-π interaction plays a pivotal role in promoting the high potency of nicotine in the brain, leading to its addictive properties. We have also discovered key hydrogen bonding interactions that uniquely contribute to the binding of nicotine to ACh receptors. These chemical studies provide a high-precision structural model for the interaction of potent drugs at brain receptors.

Cost: The entrée is Smoked Paprika and Garlic Roasted Free Range Chicken with sweet potato hash, haricots verts and roast chicken jus. The cost is $53 including salad, dessert, wine with dinner, tax and tip, payable at the door with cash or check.

Reservations: Please call Nancy Paradiso in the Section Office at (310) 327–1216 or email office@scalacs.org by Wednesday, April 20, 2011. *Note: Please honor your reservation. If you make a reservation and do not attend, you will be liable for the cost of the dinner.*

Directions: A campus map and directions to the Athenaeum are available at http://www.its.caltech.edu/~ath/pdf/Athenaeum_map.LH.pdf .

Call for Nominations

The Nominations, Elections and Awards Committee of the Southern California Section is soliciting nominations for the election of 2012 Section officers (Chair-Elect and Secretary), members of the Executive Committee, and Councilors. If you wish to propose names (including your own) for consideration, send them to:

Nominations, Elections and Awards Committee
Southern California Section, ACS
14934 S. Figueroa St.
Gardena, CA 90248
Email office@scalacs.org

Professor Dennis A. Dougherty
2010 Richard C. Tolman Award Recipient

Professor Dennis A. Dougherty received his B.S. and M.S. degrees from Bucknell University in 1974. He did his doctoral research at Princeton University with Kurt Mislow and a year of post-doctoral studies with Jerome Berson at Yale University. Dougherty joined the faculty in the Division of Chemistry and Chemical Engineering at the California Institute of Technology in 1979, where he is now the George Grant Hoag Professor of Chemistry.

Dougherty is perhaps best known for development of the cation-π interaction, a novel but potent binding interaction between molecules that plays a central role in establishing protein structures and in modulating drug-receptor interactions. The fundamental nature of the interaction was established through extensive theoretical and model studies by the Dougherty group. Dougherty also established the prevalence of the cation-π interaction in biological systems, and it is now recognized to be important in a wide range biological processes.

More recently, Dougherty has addressed molecular neurobiology, applying the mindset and tools of physical organic chemistry to the complex proteins of neuroscience – the molecules of memory, thought, and sensory perception; of Alzheimer's, Parkinson's, and schizophrenia. Target receptors include the nicotinic acetylcholine receptor, the 5-HT_3 (serotonin) receptor, and the D2 dopamine receptor. Through these efforts, Dougherty has produced fundamental insights into drug-receptor interactions, including cation-π interactions.

Dougherty is a member of the National Academy of Sciences, and a fellow of the American Association for the Advancement of Science and the American Academy of Arts and Science. He has been recognized with a number of awards, including the ACS James Flack Norris Award for Physical Organic Chemistry, the AstraZeneca Excellence in Chemistry Award, the Arthur C. Cope Scholar Award, and has been designated a Javits Neuroscience Investigator by NIH. He is also the co-author, with Professor Eric Anslyn, of the influential textbook, *Modern Physical Organic Chemistry.*

Southern California Section

Section History Project
Part Two: The Expansion Era (1929-1955)

The Great Depression hits the US Economy in 1929. The dreams of the growing middle class of Los Angeles are shattered. Despite the hard and homeless times for many of this era, the oil, motion picture, and aerospace industries attract even more people to Los Angeles in search of a better life. Braun Corporation, DuPont de Nemours, Los Angeles Chemical Company, Los Angeles Soap Company, as well as Lockheed, Douglas Aircraft, local universities, and small analytical laboratories support the local chemists through the economic slump. Los Angeles is host to the Olympic games in 1932. Albert Einstein flees Nazi Germany in 1933, the same year Angelenos feel their first massive earthquake, epicentered in Long Beach. American Crystal Sugar Company, Pacific Metals Co, California Flaxseed Co, Dow Chemical, General Chemical, and Pacific Coast Borax become corporate members of the Southern California Section in 1936, the same year economic recovery begins and UCLA becomes a Ph.D.-granting institution.

In 1939, the Southern California Section celebrates its 25th Anniversary with much fanfare from well-wishers of the ACS establishment throughout the nation. Union Station opens for business, on the site of LA's original Chinatown, across the way from LA's original pueblo (Olvera Street). Angelenos pay no attention, because they're consumed by their cars. The following year the West's first freeway, The Arroyo Parkway, is opened, in a ceremony involving local Native Americans formally granting the Arroyo land to the government. Adventure-spirited car lovers careen down the parkway at the face-flattening speed limit of 35 MPH. Filtrol, Max Factor, and Eastman Kodak become corporate members of the Southern California Section in 1940. The San Diego Section springs forth in 1941, the same year the United States enters World War II. Present day's Griffith Park Travel Town and Verdugo Hills Golfcourse become sites used to host detained Angelenos of Japanese descent.

By time the war ends in 1945, Union Oil, Shell Oil, and Monsanto Company are corporate members of the Southern California Section. Pacific Electric Railway's Red Car enjoys a brief resurgence of popularity, but can't compete with the gas-powered cars supplied by the abundant petrochemical companies in the area. The once rural landscape is now decorated with oil well pumps from Wilmington to Echo Park. The Southern California Section launches its inaugural edition of SCALACS magazine, riding on the productively motivating coat-tails of the post-war optimism. The section is 1281 members strong in 1945, one year before the Mojave Section breaks away and makes a name for itself.

After World War II, Los Angeles becomes a major chemical-producing and oil-refining district, vital to the Nation's economy. Southern California universities are in the forefront in scientific education and physical/chemical science research. Los Angeles is a great place for the industrial chemist to be, offering employment in rubber, paper, cement, ceramics, soap, steel, plastics, aerospace and electronics industries. Notable section Councilors of this era are Gordon Alles, Arnold O. Beckman, and Roger Truesdail.

The camaraderie of the chemists is high. It is a time for solidarity, support, and fraternization, as indicated by the abundance of specialized clubs for technical types:
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Southern California Section

History Project (Continued from Page 6)

American Electroplating Society, California Instrument Society, California Natural Gas Association, LA Paint and Varnish Production Club, Society of Plastics Industry, LA Rubber Group, etc. Typical Southern California Dinner meeting attendance is 300-400 people. In addition to gathering to share professional knowledge and ideas, the section holds well-attended dinner dances and sing-alongs. Some of the sing-alongs feature the DOWbert & SHELLivan UNIONeers, which parody the popular Gilbert and Sullivan tunes of the time with twisted nerdy lyrics. The public outreach of the section is tremendous. In 1948, the section sponsors a radio show called "Chemists in Action", featuring lectures, entertaining skits, and the DOWbert & SHELLivan UNIONeers. After television becomes accessible, the program moves to KTLA and is broadcasted with regularity until the late 1950s. Dodger Stadium is built in 1955, after moving a cemetery existing in Chavez Ravine to another location. The population of Los Angeles is approximately 1 million. And if it weren't for the persistent haze in the air, life couldn't be better for the chemists of this era.

Outreach Activities

Saturday, April 2, 2011 (8:45 am to 2:45 pm) The Expanding Your Horizons Conference for middle school girls will take place at Mount St. Mary's College, Doheny Campus, 10 Chester Place, Los Angeles, CA 90007. For detailed directions and maps please visit:
http://www.msmc.la.edu/about-msmc/our-campuses/driving-instructions.asp

Saturday, April 9, 2011 (9:00 am to 1:00 pm). CSUN will sponsor a Chemists Celebrate Earth Day event to bring over 200 kids from local schools to do hands on activities. Contact Dorothy Nguyen-Graff at dng@csun.edu for more information.

Wednesday, April 13th, 2011 (10 am – 2 pm): Earth Day Celebration and Fair at East Los Angeles College, 1301 Avenida Cesar Chavez, Monterey Park, CA 91754. ACS will host a table with the Student Members from ELAC. For more information, contact Bob de Groot at rdegroot@oxy.edu or Armando Rivera at RiveraAM@elac.edu.

Late April 2011 - Chemists Celebrate Earth Day Activities at the California Science Center. Chemists Celebrate Earth Day 2011 International Year of Chemistry - Environment Activities at the California Science Center, 700 Exposition Park Drive, Los Angeles, CA 90037, website: http://www.californiasciencecenter.org. Join volunteers at the California Science Center for CCED activities. Dates and Times for this event will be listed on the SCALACS website. For more information, or if you would like to volunteer please contact Henry Abrash at: abrash8@aol.com.

Saturday, June 4th Chemistry Merit Badge SCALACS will have a booth at the Boy Scout Expo at Santa Anita Race track. We need volunteers to work with the Scouts on the Chemistry Merit Badge. The show is from 10 am to 3 pm. Contact Gerald Delker at delker@earthlink.net, or (626) 622-7776.

This Month in Chemical History

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

I am writing this column early in 2011 and, as I have done in the past, I draw my inspiration from the chemistry of a century ago as presented in the "Annual Reports on the Progress of Chemistry for 1911" published for The Chemical Society [of London] in 1912. This is volume VIII of this interesting series which gives us an insight into the discoveries that were regarded as significant by leading chemists of the time. The Publication Committee of the Society included such distinguished chemists as Frankland, Groves, and Ramsay. Contributors were equally well-known including Baker, Chattaway, Lowry, and Soddy. There are Nobel Laureates in each group.

The first article to catch my eye describes an elegant new method for determining boiling points of liquids on samples ranging between 30 and 100 mg. New determinations of the absorption spectra of inorganic salts have been made by a photographic method, including absorption coefficients in the infrared, visible and ultraviolet regions. Photochemical studies have been carried out on the isomerization of maleic into fumaric acid, catalyzed by bromine. The complex allotropy of elemental phosphorus has been studied further including the white, red, violet, and "metallic" forms; I assume this last form is what we would call black phosphorus.

Revised atomic weights, many deriving from the work of the U.S. Nobelist T. W. Richards, have been determined for such familiar elements as calcium, iron, and mercury. Sir James Dewar's group (yes, he of the Dewar flask) has been studying carbon monosulfide, CS, formed by the action of a silent electric discharge on carbon disulfide vapor. When trapped at -210^{o}C a white deposit (monomeric or a low polymer of CS?) is obtained but within 15 minutes the deposit turns brown (a high polymer?) "the transformation being accompanied by a flash and sometimes by a detonation sufficiently violent to shatter the tube." An electric discharge in N_2 seems to convert a small proportion of the nitrogen into an active form that the authors suggest may be nitrogen atoms.

H. B. Dixon and his colleagues have continued work on the ignition points of explosive mixtures of gases – a field of some practical importance in mining and chemical manufacturing. They have identified a period of pre-flame combustion when such mixtures are compressed which helps to raise the temperature of the gas mixture to the explosion point. Burgess and

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This Month in Chemical History

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Wheeler have carried out parallel studies on aliphatic hydrocarbons, under the auspices of the Mining Association. Recent events in Chile and elsewhere remind us of the problems of explosive gas mixtures that plague mining to this day.

In inorganic chemistry studies of the luminescence of the sulfides of the alkaline earth metals have shown that while the pure sulfides do not luminesce, very small quantities of polysulfides are sufficient for luminescence. Old-fashioned cathode ray tubes made use of this phenomenon. Sir William Crookes has shown that a pure white diamond changes in color to “a splendid green” when exposed to the radiation from radium. Dewar has finally prepared solid O_2 by evaporating liquid oxygen at low pressures. In experiments somewhat reminiscent of “Cold Fusion” Claude has reinterpreted experiments in which neon containing only a trace of helium seemed to have been transmuted into helium! More careful study has shown that the experiment only demonstrates the selective absorption of helium in preference to neon by metallic copper.

San Gorgonio Section

Chair's Message—A Chance to Touch a Child's Life

National Lab Day was initiated in May 2010 with the following headline: **National Lab Day Launches – President Obama Applauds Initiative; Calls for New Era in Hands-On Science, Technology Learning.** The inaugural event was celebrated in May 2010. The concept behind National Lab Day was to pick one day a year, in the first week of May, to facilitate and promote hands-on learning across our nation's classrooms. The goal was to connect Science, Technology, Engineering and Math (STEM) professionals in the community with grades K-12 students and teachers for hands-on science experiences.

The success and evolution of the event is evidenced by the name change – from National Lab Day to National Lab Network (NLN). It has become a tool to connect teachers with STEM professionals every day of the year. The user-friendly NLN website (http://www.nationallabnetwork.org/) provides a forum where teachers with projects can be matched with interested STEM community members.

Here are three projects within the San Gorgonio Section that were posted by teachers. So far, all three projects still need STEM volunteers:

Highland Elementary School in Riverside, Project 1: "*We have about 200 students in our two after-school programs each day. Most of the students are English learners and students at-risk. Chemistry is a science topic that has lots of hands-on possibilities, but at the elementary level we have very few teacher experts in this area. My hope is that through volunteer projects we can inspire students to love and enjoy science, and aspire to careers in this area.*" http://www.nationallabnetwork.org/projects/2068-hands-on-science-projects

Project 2: "*The achievement scores at third grade are the lowest in our school. We have created an action-research project in one third grade class to study the effects of giving each student an iPod Touch to enhance the learning and engagement possibilities. The teacher is requesting input on effective applications to use with third graders, and practices that work to increase student achievement. Working real time with a scientist on a project to study and collect data on their iPods would be great*." http://www.nationallabnetwork.org/projects/2067-itouch-classroom.

Henry J Kaiser High School: *"After the AP Exam in May, I would like my senior AP students to do a project. Biotechnology, health or any current topic are possible topics. I am looking for STEM professionals to come into the classroom and supervise the seniors doing outside research and data manipulation. They will do a short presentation after about two weeks of work.* http://www.nationallabnetwork.org/projects/2068-hands-on-science-projects

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San Gorgonio Section

Dinner Meeting

Wednesday, April 27, 2011

Innocent or Guilty: The Role of DNA Analysis

Mark Traughber
California Department of Justice
Riverside Criminalistics Laboratory

Lotus Garden

111 East Hospitality Lane
San Bernardino

Social and Checkin: 5:45 pm
Dinner: 6:30 pm
Program: 7:30 pm

Abstract: DNA analysis is based on the use of genetic fingerprints, short sequences of the chemical building blocks of DNA with variations unique to each person. The first conviction based on DNA evidence came in the 1987 rape trial of Tommy Lee Andrews in Orange County, Florida. Since then the technique has become an increasingly powerful tool in crime investigations. It has served not only to prove decisive in convicting those guilty of a crime, but also to exonerate the innocent. In California, the passage of Proposition 69, "DNA Fingerprint, Unsolved Crime and Innocence Protection Act", in 2004 led to a significant increase in the number of DNA samples collected and analyzed, with the DNA profiles added to a statewide DNA data bank. The DNA profiles are also submitted by the Department of Justice to the Combined DNA Index System, a repository maintained by the Federal Bureau of Investigation. This increased number of DNA profiles has also led to the solution of many "Cold Cases", crimes that have not been solved but are now longer being actively investigated. The methodology of DNA analysis along with its use in solving both "hot" and "cold" cases will be the main topics of this presentation.

Speaker: Mark Traughber received his Bachelor's of Science degree in Chemistry from CSU San Bernardino in 1989. He is currently a Senior Criminalist at the California Department of Justice Riverside Criminalistics Laboratory. He has extensive experience in several areas of forensic science. Since 2004 his work has focused on DNA Analysis and Forensic Biology and he has testified in this area as an expert witness over 50 times. He has also taught DNA training courses for lawyers and investigators.

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San Gorgonio Section

April Meeting (Continued from Page 11)

Dinner, Cost and Reservations: The Chinese dinner will feature eight entrees, rice, and soft drink or iced tea (complimentary refills). The cost will be $13 for ACS members, $15 for nonmembers, $10 for retirees and $5 for students. Please make your reservation no later than 12 noon on Monday, April 25th by contacting either Eileen DeMauro (EDiMauro@MtSAC.edu) or Dennis Pederson (909-537-5477, dpedersn@csusb.edu).

Directions: From the west, take Interstate 10 to the North (second) Waterman exit in San Bernardino. Drive north on Waterman to the main intersection and turn left onto Hospitality Lane. Go about 0.3 miles, the Lotus Garden will be on the left. From the east, take Interstate 10 to the Waterman exit. Turn left onto Hospitality Lane and go about 0.5 miles, the Lotus Garden will be on the left. The meeting room will be on the right as you enter the restaurant.

Chair's Message (Continued from Page 10)

All three projects continue until the end of the school year – late May or early June, so there is plenty of time to get involved. If you would like to do something incredibly satisfying for yourself and also make a difference in a student's science education, go to the website listed below one of these projects and volunteer!

- Eileen DiMauro, 2011 Chair

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Do Not Delay!

Contains Dated Meeting Announcement

PERIODICAL

Bi-Section Chemists' Calendar

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