

THE VORTEX

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CALIFORNIA SECTION
APRIL 2011

Science & Technology of the Civil War
Lafayette Library - 08 March 2011
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March meeting of the Science Cafe

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Chair's Message

Bryan Balazs

Are you overwhelmed at times by the seemingly relentless appeal for donations by some organizations?



I know I am. There have been some otherwise prestigious philanthropic organizations that I have stopped donating to when the mailing, email, and phone call solicitations approached a weekly rate. It seemed like they spent more on postage and phone bank operators than I donated to them! Despite calls (and responses to surveys) on my part to try and get them to remind me just once or twice a year, the mailings and phone calls just kept coming. I believe it is called "Donor fatigue".

We are fortunate in the Section not to have to resort to such tactics. Our programs and offerings are funded through three main routes: 1) donations for Project SEED which are used to support only that program, 2) yearly allotments from ACS National which are a combination of your local section dues (which are optional) and portions of the national dues, and 3) income from investments in our section's Trust Fund. The latter resulted

(as I understand it) from a small profit on a regional meeting many years ago, which has steadily grown through careful stewardship to the point of being able to supplement many of the ongoing programs in our section without depleting the capital.

The Vortex is actually self-sufficient these days, with advertising revenue being enough to support the production and dissemination of the newsletter. Actually, if advertising income was more than enough, we could end up owing the IRS some taxes, a situation we would rather not be in.

We have also had donations over the years, both locally and at the ACS National level. The most recent example I can think of for the latter case is a \$250,000 donation to Project SEED, and these funds no doubt filtered down from national to our local program, helping our Section's goal to have one of the largest SEED programs of any local section. Donations at the local level have helped too, such as stock donated by Lloyd Ryland several years ago, allowing us to initiate the annual Ryland High School Teacher Award, an entirely new program to recognize and reward exceptional contributions to the teaching of high school chemistry. There have been other donations locally as well, and believe me, every little bit helps as 100%

(continued on page 9)

April Joint Section Meeting California and Santa Clara Valley Sections

Title: "Beer: The great scientific medium"

Speaker: Dr. Charlie Bamforth, Anheuser-Busch Endowed Professor of Malting & Brewing Sciences at UC Davis.

Time: Thursday, April 28, 2011

Location: Devils Canyon Brewing Company 111 Industrial Way, Suite # 7 Belmont, CA 94002

Time: 6:30pm Networking & Beer Tasting, 7:00pm Dinner, 7:30pm Presentation

Cost: \$27 (includes beer or rootbeer sampler) Menu Buffet dinner with sliders, polish sausage, wings, cheese quesadillas, garden salad, fruit, dessert, water, beer/rootbeer sampler. Please register by email to office@calacs.org, or call the office at (510) 351-9922. Deadline to RSVP is April 22. No dinner reservations accepted at the door.

Abstract

Beer: the most complex and fascinating of beverages when considered from a chemistry perspective, meaning that it is harder to make than any other drink. Brewers do not mess about with hyped rhetoric, they just get on and make a liquid that delights and does you good. There is a beer for pretty much every occasion. Every drop is a vintage.

Biography

Dr. Charlie Bamforth has been part of the brewing industry for over thirty two years. He is formerly Deputy Director-General of Brewing Research International and Research Manager and Quality Assurance Manager of Bass Brewers. He is a Special Professor in the School of Biosciences at the University of Nottingham, England and was previously Visiting Professor of Brewing at

Heriot-Watt University in Scotland. Charlie is a Fellow of the Institute of Brewing & Distilling, Fellow of the Society of Biology and Fellow of the International Academy of Food Science and Technology. He is Editor in Chief of the Journal of the American Society of Brewing Chemists, is on the editorial boards of several other journals, and has published innumerable papers, articles and books on beer and brewing – and also written prolifically on soccer. His latest contributions have been *The Brewmaster's Art* (A 7-CD recording in The Modern Scholar series) and *Beer is Proof God Loves Us: Reaching for the Soul of Beer and Brewing* (FT Press). In October 2010, he was on The Honor Roll as one of the 20 professors who are changing the classroom in the US (Playboy magazine).



"Expanding Your Horizons Career Fair" in San Ramon Report

Members of the Women Chemists Committee participated again at this year's "Expanding Your Horizons Career Fair" at the San Ramon Campus of Diablo Valley College, on February 26, 2011. The daylong event was held for young women, grades 6-9, from Dublin, Livermore, Pleasanton, San Ramon and Sunol school districts to increase interest and foster awareness of careers in math and science. The Career Fair involved a full day of hands-on workshops, special group activities, and a career fair and science expo. It provided the students opportunities to meet and interact with positive role models who are active in math- and science- related careers. The conference is coordinated by Diablo Valley College San Ramon, Lawrence Livermore National Laboratory, Sandia National Laboratories, and the Association of University Women.

The Women Chemists Committee members Elaine Yamaguchi, Lynnette Campbell, and Margareta Séquin, together with Alex Madonik and San Francisco State University chemistry student Kate Markham got great interest from the Career Fair attendants with their hands-on activity on guessing plant smells and building molecules from model kits. It was a rewarding event for the young girls as well as for the organizers and volunteers, and the group looks forward to continued involvement with this annual event.

April Meeting California Section

Topic: Life Without Chemistry? In celebration of the International Year of Chemistry four 15-minute summaries will be presented to show what chemistry has contributed in four essential areas to our everyday lives without which we would be living in Stone Age conditions

Date: Saturday, April 30, 2011

Time: Social gathering at 3:00 p.m., talks at 3:30-4:30 p.m. followed by questions.

Place: Mills College, 5000 MacArthur Blvd., Oakland, CA in the Gather Room (Room 101) in the Graduate School of Business Building

Speakers: Dr. Paul Vartanian on Energy and Transportation

Dr. Jacques Guertin on Communication and Information

Dr. Lee Latimer on Health and Medicine

Dr. Attila Pavlath on Agriculture and Food

Reservations: RSVP by Wednesday, April 27, to Julie Mason at the Section office at office@calacs.org or call (510) 351-9922 (Directions to Mills College are also available) There is a map on the website www.calacs.org, click on "About Us"

In addition to the talks a colorful 32-poster exhibit, Technology Milestones in Chemistry will be displayed illustrating chemical developments in these areas.

Paul Vartanian

After obtaining his Ph.D. degree in physical organic chemistry from the Univ. of California, Davis, Dr. Vartanian joined Texaco, Inc., in New York. His assignment was to develop additives for gasoline and diesel fuel applications. After three years, he left Texaco and joined Chevron Research Company to develop grease lubricants. He spent the last 20 years of his career as a member of Chevron Oronite Co. developing lubricant additives, retiring in 2008. Dr. Vartanian has received 13 patents in the fuel and lubricant areas and authored many reports and papers. He is a Fellow of the NLGI.

Attila Pavlath

He obtained his education and doctoral degree in Hungary where he taught at the Technical University of Budapest. He came to North America in 1957 and after a short stay in Montreal at the McGill University he settled down in the Bay Area in 1958. First he worked at Stauffer Chemical Company, then since 1967 at the U.S. Department of Agriculture in Albany on a wide variety of programs to improve U.S. Agriculture. He published 130+ papers, holds 25 patents, and lectures worldwide. He retired when he was elected ACS President, but he continues at USDA on emeritus status.

Jacques Guertin

Dr. Jacques Guertin, is a materials scientist with additional experience in toxicology and environmental science and is a teacher of all sciences. Dr. Guertin has a Ph.D. in chemistry from McGill University, Montréal, Canada. He holds 5 U.S. patents and is author of more than 80 technical publications and is coauthor of 2 definitive books on BTBE and Cr(VI). He has worked at Bell Telephone Laboratories, the Electric Power Research Institute, and environmental consulting firms. Currently, Dr. Guertin is partly retired but continues his own technical consulting business in Newark, California and is writing a book on the science regarding global warming.

Lee H Latimer

A graduate from Tulane University in 1972, Dr Latimer obtained his Ph.D. in Synthetic Organic Chemistry from the University of Wisconsin-Madison in 1976 followed by post doctoral studies at University of California-Berkeley. From 1979 to 1993, he was with Eastman Kodak in Rochester. His interest are in synthetic methods, drug design and science management as Senior Scientist from Elan Pharmaceutical. (recently retired) Dr. Latimer is co-author on a chapter on Alzheimer's Disease and holds patents on production of pharmaceuticals.

California Section Outreach

Over the years the California Section has been in the forefront with a number of outreach programs that bring chemists and chemistry together with non-technical people in an informal setting that both informs the public and presents the benefits of chemistry in a meaningful way. The Section has several current and ongoing programs that deserve your recognition and support.

Dr. Marinda Wu in an article in this issue has described some of the Section's activity with Science Cafe. Dr. Wu has been instrumental in forming an alliance between the California Section and the Lafayette Library that uses the Science Cafe format and provides a consistent and successful outreach venue.

Dr. Attila Pavlath has been an untiring activist in promoting chemistry. In this year, 2011 which was proclaimed "International Year of Chemistry", he has traveled extensively giving Power Point presentations on *Technology Milestones in Chemistry* which he has managed to get translated into many languages. There are 32 colorful posters illustrating chemical developments in four areas.

Energy and Transportation
Communication and Information
Health and Medicine
Agriculture and Food

Attila is happy to share the presentation and posters.

The best way to support these programs and others is to become more involved with the Section. Pick the program or function you like and volunteer or just start by coming to the Excom meeting, (check the calendar on the website, www.calacs.org).

New Logo Needed

The logo that the Section has been using was designed for the 100th anniversary of the California Section. The Executive Committee decided that the logo should be updated since we are now more than 100 years old. Please email your ideas and designs for a Section logo to office@calacs.org. All submission remain the property of The California Section.





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How Rare is Rare? (Part 2)

Bill Motzer

In Part 1 (March 2011 Vortex) I discussed why the Rare Earth Elements (REE) were really not so rare. In fact, their crustal abundances exceed that of gold, silver, copper, and lead. While not common, the latter metals are more easily accessible; gold generally occurs as a native metal, and silver, copper, and lead, generally occur as sulfides, which are easily extracted from their respective minerals and ores. However, the REE occur in more complex minerals contained in rather rare rock types. Another method for determining the rarity or abundance of a mineral commodity is to examine its clark number or value. Frank Wigglesworth Clarke (1847 to 1931), American scientist, educator, and geologist, was sometimes known as the “Father of Geochemistry” and is also credited with the first elemental determination of Earth’s crustal composition. A “clark” is equal to the average abundance of an element in the Earth’s crust and the “clark of concentration” would equal the concentration of an element in a mineral or rock when compared with its average crustal concentration. For example, the clark of copper is about 55 mg/kg, or 0.006% (55/10,000). In the mineral chalcocite (Cu_2S), the copper concentration is 79.8%. Thus, the clark of concentration within this mineral is $79.8/0.006$, or 13,300. For Ce, the clark is 70 mg/kg or 0.007% and in the mineral bastnasite (see below) the Ce concentration is 63.94% and the clark of concentration is $63.94/0.007$ or 9,134. Therefore, based on the clark, on a relative abundance scale, Ce’s abundance is comparable to Cu.

Mineralogy: One of the primary REE-bearing minerals is bastnasite (or bastnaesite), which actually occurs as a group or family of three carbonate-fluoride minerals. Bastnasite is a lananthum-cerium fluoro carbonate $[(\text{Ce},\text{La})\text{CO}_3\text{F}]$ with varying concentrations of Ce and La. Although most bastnasite is Ce-bearing, Y types may also

occur as $(\text{Y}, \text{Ce})\text{CO}_3\text{F}$. Monazite, a REE-bearing phosphate, actually occurs as three distinctive minerals, all having different REE compositions and percentages: (1) cerium monazite $[(\text{Ce}, \text{La}, \text{Nd}, \text{Th}, \text{Y})\text{PO}_4]$, (2) lanthanum monazite $[(\text{La}, \text{Ce}, \text{Nd})\text{PO}_4]$, and (3) neodymium monazite $[(\text{Nd}, \text{La}, \text{Ce})\text{PO}_4]$. Bastnasite and monazite are the two largest sources of Ce and other REE.

Petrology and Ore Deposits: The geologic setting of REE-bearing minerals in economic concentrations usually occurs within or of a variety of rock types and mineralizing events. The most significant economic concentrations are hosted in, or associated with, alkaline and peralkaline igneous rocks and carbonatites. These rare rocks form from magmas derived by partial melting of rocks within the Earth’s mantle. Based on bulk whole rock chemistry, such igneous rocks are generally classified as peralkaline (literally meaning “with excess alkalis”) when $\text{Na}_2\text{O}+\text{K}_2\text{O}$ exceeds Al_2O_3 and peraluminous (meaning “excess alumina”) when Al_2O_3 exceeds $\text{Na}_2\text{O}+\text{K}_2\text{O}$. Upon ascent into the Earth’s crust, such magmas undergo significant changes in their chemical composition due to changes in pressure, temperature, composition of surrounding rocks, and finally hydrothermal alteration. This results in a diversity of rock types enriched in zirconium, niobium, strontium, barium, lithium, thorium, uranium, and the REE. Associated mineral deposits therefore are quite diverse and difficult to classify, because the distinctive features of these deposits and their rarity generally result in classifications that have only one or at most, a few known examples.

Carbonatites are very rare and unique intrusive igneous rock bodies, commonly found as stocks (intrusions less than 100 km^2) but they may also occur as dikes and veins composed of more than 50% carbonate minerals, predominantly calcite (CaCO_3) and dolomite $[\text{CaMg}(\text{CO}_3)_2]$. One of the most famous carbonatite deposits is at Mountain Pass, in California’s upper Mojave Desert (west of Las Vegas and just north of Interstate 5). Discovered in 1949, by 1966 it had become a world-class deposit owned and operated by Molycorp,

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of our income goes to support our programs and services for members, education, and public outreach, and none as payment to our dedicated volunteers. And, rest assured, we will never badger you about donations, as so many organizations seem to do!



Younger Chemist Committee (YCC)

In celebration of the International Year of Chemistry (IYC) 2nd quarter theme of alternative energy, YCC will be energizing eager young students with an Energy Egg Hunt on April 17 followed by a forensic science mystery that uses live actors to engage the minds of the students in dusting for fingerprints and making spaghetti splatters to find out why the dough is doh.

For more information visit the YCC Facebook page



Lloyd Ryland Award

The California Section of the American Chemical Society is soliciting nominations for our Section's Lloyd Ryland Outstanding High School Chemistry Teacher. The winner will receive a certificate and a check for \$500, and the winner's chemistry department will receive a check for \$500 for supplies. Our awardee will also be our guest at our Awards meeting in May. Chemistry teachers can leave a lasting impression on students, and all of us have had a wonderful teacher that has inspired us. We would like to recognize those high school chemistry teachers that have made a difference.

Please note that our winners last year were nominated by our members (we generally only award one teacher each year, both nominees last year were so outstanding that we selected both teachers).

For more information and to download the Lloyd Ryland Award nomination form, please visit our website at www.calacs.org. Nominations forms must be received by March 31, 2011. The nomination should state the nominee's accomplishments, specific work to be recognized, contributions to excellence in teaching high school chemistry. We will also need a brief biographical sketch of the nominee

Please send all completed nomination forms to our Section office at office@calacs.org or mail nominations to 2950 Merced Street, Suite 225, San Leandro CA 94577.

The award is named after Mr. Lloyd Ryland, a member of the California section of the American Chemical Society for 65 years and a strong believer in chemistry education. He was born in San Francisco in 1912 and lived his entire life in the Bay Area. Mr. Ryland received his bachelors degree from U.C. Berkeley and was employed by Shell Development Company for 65 years as a chemist. During World War II he joined the U.S. Coast Guard Auxiliary and after the war became a member and officer of three Yacht Clubs. Mr. Ryland made a generous contribution to the Section and we are pleased to honor him by naming this award after him.

California Section Science Cafes

Marinda Li Wu
ACS Director-at-Large

The California Section of ACS has offered Science Cafes to the general public as a public outreach program since 2007, but 2011 marks the beginning of a wonderful partnership with the Lafayette Library and Learning Center Foundation (LLLCF). Instead of the previous two or three science café programs offered each year, by partnering with LLLCF and cosponsoring science café programs, we are now able to offer a monthly science café program to the general public (a goal for the future we had discussed back in 2007!).

The goal of Science Cafes is to “promote science literacy with the general public on topics of current scientific interest.” Science cafes began in Europe where a science expert can chat with the general public on a science topic of interest while enjoying refreshments in an informal setting like a café. ACS began promoting science cafes as a way to connect with the general public back in 2007. Our California Section immediately liked the science café concept so we began offering such a public outreach program to the general public in Orinda restaurants since 2007 and more recently in November of 2010 for the first time at the Lafayette Library.

We would like to thank the many volunteers who have helped nurture and grow the California Section Science Café program from its start in 2007 until now. A brief history of the growth of our science café program for the California Section follows. The initial meeting to organize Science Cafes for the California Section involved anyone interested in helping after some discussion at a local section Executive Committee meeting. Long time volunteers from our section, Linda Wraxall, Sheila Kanodia, Lou Rigali and Marinda Wu met to discuss how to start up a science café program for the California Section at a former local section office in Walnut Creek back in 2007. Because everyone was busy and no one person felt able to take on chairing a new science café program for the California Section, it was decided to run the program with co-chairs. Dr. Sheila Kanodia volunteered to submit a

first application to ACS for a Science Café mini-grant for the California Section. Since then, the local section chairs each year have helped to do this for the Section.

Thus, Linda Wraxall and myself co-chaired the California Section Science Café program for the first two years, organizing two science café programs, the first year in 2007 and then three science café programs in 2008 with the additional help of Dr. Debbie Scott. All of the early science café programs were held in Orinda restaurants on various topics ranging from programs on “Chocolate: Food of the Gods, Fact and Fiction” to “Earthquakes: How Not to Get All Shook Up in the Bay Area” to “Diabolic Beauties: Mt. Diablo Wildflowers” attracting both large crowds of standing room only to small audiences due to bad weather or incorrect dates in local newspaper coverage. A lot was learned from other science café programs in Berkeley, and San Francisco. Eventually sound equipment and microphones were acquired so that the speakers could be better heard. The science cafes always received great media coverage in various local newspapers due to the support from Orinda’s mayor!

In 2008, the California Section Women Chemists Committee to adopted the local science café program which it has promoted as a WCC program for the California Section ever since. The current WCC co-chairs are Dr. Margareta Sequin and Dr. Trudy Lionel. Besides Dr. Debbie Scott and Dr. Sara Gaucher the two WCC co-chairs began helping out with program. In 2008, three Science Cafes were offered on topics such as “Can a Virus explain Diabetes and other Diseases?” and also a experiment with a science café in Berkeley instead of Orinda was begun.

When both Linda and Debbie were no longer able to help with our Science Café program, Professor Valerie Burke from St. Mary’s College in Moraga joined the sixth local Science Café program in Orinda on the theme “Searching for ET” in November 2009. It just happened that the speaker of this popular science café, Dr. Margaret Race from the SETI Institute was also on the Board for the Lafayette Library. Thus a potential partnership with the Lafayette Library began soon after we met in late 2009.

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The first Science Café at the Lafayette Library last November 29, 2010 on the “Science of Art Conservation and the Sacred Art of Bhutan” which attracted a public audience of over a hundred and lots of great media coverage in several local newspapers. Our California Section Public Relations chair, Lisa Aguirre, produced a publicity flyer that was posted throughout the local communities of Orinda, Lafayette and Moraga. Simple boxed \$10 dinners were provided by the Lafayette Library’s Bookmark Café along with beverages for purchase including wine. This was our first Science Café at a library instead of a restaurant. The event had the support of Kathy Merchant, Executive Director of LLLCF.

The great success of this first Science Café program at the Lafayette Library convinced both the Board of the LLLCF (Lafayette

Library and Learning Center Foundation) and the California Section ACS Executive Committee, respectively, to partner in this mutually beneficial collaboration to offer the general public once a month at the start of 2011. More information on Science Cafes can be found at www.sciencecafes.org.

A February 2, 2011 Science Café on the science of “Building Hoover Dam” attracted a packed audience of 150 into the Community Hall of the LLLCF, and the March 8 science café program on the “Science & Technology of the Civil War” predictably would attract much public interest. Additional upcoming Science Café programs at the Lafayette Library cosponsored by the California Section, WCC of ACS and the LLLCF on April 19 Science Café will be on “Computer Technology, Google Earth, and Interdisciplinary Learning” presented by Jerome Burg, the creator of googlelitrips.org



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Inc. and it became the major source of light REE (LREE), particularly Eu used in color television sets. The orebody consists of carbonatite dikes composed of 40% calcite, 25% barite (BaSO_4), 11% bastnaesite, 10% strontianite (SrCO_3) and 8% quartz (SiO_2). The average ore grade is 9.3% LREE with estimated reserves in 2008 exceeding 20 Mt rare earth oxides (REO) with a 5% cutoff grade. Mountain Pass ceased active mining in 2002 because of environmental restrictions and lower REE prices but continued processing previously mined ore. In December 2010, Molycorp obtained the required environmental and construction permits for a new mine ore processing plant; construction began in January 2011 with completion scheduled by the end of 2012.

Other deposits: Within hydrothermal systems, REE minerals can also occur in quartz (SiO_2) veins, fluorite-bearing apatite veins and associated breccias (broken rock) fillings. REE minerals also form in skarn deposits (those formed along contacts of igneous intrusions and surrounding country rocks), and in pegmatites (very coarse grained igneous rocks with the mineral composition of granite). They may also occur as secondary deposits when REE-bearing minerals become concentrated in placer and lateritic clays. REE are also extracted from uranium and niobium milling processes.

Outside of the U.S., other important REE deposits include the Chinese Bayan Obo iron-niobium-REE deposit of Inner Mongolia, which has similarities to carbonatite REE deposits and to hydrothermal iron-oxide-copper-gold-REE deposits, such as

Olympic Dam REE deposit of Australia and the Kiruna deposit in Sweden. The Bayan Obo ore grades range from 3 to 6% REO, with reserves of at least 40 Mt. The second major source of Chinese REE are the REE ion-adsorption oxide ore deposits occurring in lateritic weathering crusts and soils that form on granitic and syenitic rocks in southern China's tropics. These oxide ores have relatively high proportions of HREE that can be easily mined and extracted.

In Part 3, I will discuss some of the uses of REE, their current prices, environmental problems associated with extraction and processing, and forensic geochemistry.



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April Historical Events In Chemistry

Dr. Roland May

April 2, 1953 Francis H. C. Crick and James D. Watson mailed a 900-word article on the structure of deoxyribonucleic acid (DNA) to Nature on this date.

April 5, 1956 Marshall Gates & G. Tschudi announced synthesis of morphine on this date.

April 6, 1863 James Walker, a researcher on hydrolysis, ionization constants, and amphoteric electrolytes with organic compounds, was born on this day.

April 8, 1911 One hundred years ago on this date, Melvin Calvin was born. He received the Nobel Prize in Chemistry in 1961 for his research in photosynthesis.

April 10, 1863 One hundred years ago in 1886, Paul Louis Toussaint Héroult discovered the electrolytic aluminium process in the same year that Charles Martin Hall discovered the same process for isolating aluminum, which is called the Hall-Héroult process. Also, he invented the electric arc furnace for steel in 1900, which replaced some giant smelters for the production of a variety of steels and was born on this date..

April 14, 1927 Alan MacDiarmid, who was born on this date, is a researcher on the synthesis of conductive polymers. In 2000, he shared the Nobel Prize in Chemistry with Alan J. Heeger and Hideki Shirakawa for the discovery and development of conductive polymers.

April 15, 1861 One hundred and fifty years ago on this date, Ernest Solvay received his first patent entitled "Industrial Production of Sodium Carbonate by Means of Marine Salt, Ammonia, & Carbon Dioxide.

April 15, 1961 Fifty years ago on this date, Carol W. Greider was born. She shared the Nobel Prize in Physiology or Medicine in 2009 with Elizabeth H. Blackburn and Jack W. Szostak for the discovery of how chromosomes are protected by telomeres and the enzyme telomerase.

April 16, 1728 Joseph Black developed the concept of latent heat and laid the foundation for modern quantitative analysis. He was born on this date.

April 18, 1838 One hundred years and twenty-five years ago in 1886, Lecoq de

Boisbaudran found dysprosium in didymium that Per Teodor Cleve had concluded in 1874 that it had two elements later named neodymium and praseodymium. Also, he discovered gallium (Ga, 31) in 1875, samarium (Sm, 62) in 1880 using spectroscopic methods devised by Robert Bunsen and Gustav R Kirchhoff. He was born on this date

April 20, 1912 Gertrude E. Perlmann was born on this date and did research in protein chemistry. She received the Garvan Medal in 1965.

April 21, 1774 Jean-Baptiste Biot, who discovered optical activity, was born on this date.

April 22, 2007 Celebrated by ACS on this day but the first Earth Day was founded by Sen. Gaylord Nelson, Father of Earth Day and organized by Denis Hayes on April 21, 1970.

April 22, 1919 Donald J. Cram, a researcher in application of stereochemical techniques to organic reaction mechanism, was born on this date. He invented carceplexes or guest molecules completely encapsulated by host. (Synthesized a variety of host-guest complexes including crown ether complexes and shared the Nobel Prize in 1987 with C. J. Pedersen and J-M. P. Lehn for their development and use of molecules with structure-specific interactions of high selectivity.

April 23, 1917 Rohm & Haas Co. was incorporated on this date.

April 27, 1880 Charles James, who devised crystallization methods for separating the rare earth elements, was born on this day.

Additional historical events can be found at <http://faculty.cua.edu/may/Chemistrycalendar.htm>



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Science Cafe Report

The program on March 8 was on the “Science & Technology” of the Civil War. The speaker was Professor Carl Guarneri, History Department Saint Mary’s College of California. Professor Guarneri is an historian of the nineteenth and twentieth-century US whose research interests focuses on three areas: global and comparative approaches to American History, utopias, and the Civil War.

He was accompanied by “Civil War re-enactors in period dress who discussed how technologies and science shaped the war and American history. We learned about innovations in communication, medicine, ships, railroads, weaponry, and photography.” For more information please visit <http://galileo.stmarys-ca.edu/cguarner/>



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Science & Technology of the Civil War
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