

Silicon Valley Chemist

Santa Clara Valley Section

American Chemical Society

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AUGUST 2009 NEWSLETTER TOPICS

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September Dinner Meeting

Date: THURSDAY, September 17

Time: 6:00 Social Hour
7:00 Dinner
8:00 Presentation2

Location: Biltmore Hotel & Suites
2151 Laurelwood Blvd.
Santa Clara, CA 95054

Speaker: Dr. Thomas Passell
Thinking Outside the Box
About Cold Fusion

Cost: \$27.00 with a choice of:
Grilled Salmon
Pasta Primavera

Reservations: www.scvacs.org
or Shirley Radding
408-246-2564
408-296-8625 Fax

Reservations should be made by September 14th stating your name, address, company affiliation, number of people in party, and menu selection. If you are unable to honor your reservation and do not cancel by Tuesday, September 15th, you will be invoiced following the dinner meeting.

Reminder

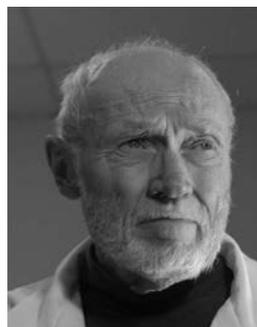
September Dinner Meeting

Reminder

Thinking Outside the Box About Cold Fusion

Abstract

Since that 1989 announcement claiming the observation of excess energy in electrolysis of a palladium cathodes in an electrolyte of lithium deuterioxide, we have experienced what I characterize as a scientific version of a "religious war". In warfare, essential reality is frequently distorted or ignored altogether. Such is the case in this "war". My purpose in this talk is to present my view of the essential experimental results of 20 years of research done under wartime conditions of controversy, demonization of proponents, fights for budget share, refusal of the U.S. Patent Office to consider cold fusion patents, and refusal to publish by mainstream scientific journals. The internet is the only means by which research results on this subject have received widespread



Dr. Thomas O. Passell

availability. Several hundred are accessible on the web site www.Lemr-Camr.org.

Here is my working hypothesis of the conditions required to observe the cold fusion phenomenon:

1. High fluxes of deuterium atoms through interfaces of grains of metals that readily accommodate movement of hydrogen atoms interstitially is the driving variable that produces the widely observed episodes of excess above the total of all input energy.
2. This deuterium atom flux has been most often achieved at high electrochemical current densities on highly deuterium-loaded palladium cathodes, but is clearly possible in other experimental arrangements in

continued on next page

2009 Shirley B. Radding Award Recipient Dr. Bryan Balazs

The award was presented at the Santa Clara Valley Annual Family Picnic and Awards Ceremony on July 11th. Dr. Balazs received his B.S. in chemistry at Washington and Lee University in 1985 and subsequently spent a year in Germany at the University Erlangen-Nurnberg under an ITT/Fulbright Fellowship. He obtained a Ph.D. in Electroanalytical Chemistry from the California Institute of Technology in 1992, and proceeded from there to a post-doctoral appointment at Lawrence Livermore National Laboratory (LLNL). Since being hired by LLNL as a Staff Scientist in 1994, he has worked on numerous projects including electrochemical sensors, waste treatment technologies, and material lifetime predictions. He is currently the Associate Program Leader for Budgets and Planning within the Primary Nuclear Design Directorate and is responsible for overseeing and integrating a large program involving dynamic material properties, high energy density physics, advanced radiography, and hydrodynamic testing.

First awarded in 1994 to its namesake, the Shirley B. Radding Award annually honors someone who has been a member of the ACS for at least 20 years. Nominees must have demonstrated dedicated, unselfish leadership, service and significant contributions over a sustained period of time to industrial, applied or academic chemistry and to the ACS through elected or appointed positions at local, district and national levels. The award consists of an honorarium of \$1,000 and a suitably inscribed memento.

Reminder, continued from front page

- which the metal is interfacing gaseous deuterium, as in an electrical glow discharge or membrane permeation.
- Since excess heat episodes must be producing the product(s) of some nuclear fusion reaction(s), screening of options will be easier with the measurement of those "ashes" than with the observance of the excess heat.
 - All but a few of the exothermic fusion reactions known among the first five elements produce He-4. Hence, He-4 appearance may be the most efficient indicator of some fusion reaction without commitment to which reaction is occurring.
 - Absence of the normally observed products of the D+D reaction have led to the assumption by mainstream scientists that no fusion reactions could be occurring. However, direct production of He-4 by the D+D reaction is rare, but is known to occur in hot fusion. Also, other reactions such as B-10+D -> He-4 + Be-8 followed by Be-8

-> 2 He-4 are possible reactions that do not produce the missing neutrons or tritium atoms expected in normal D+D hot fusion. Other reactions such as Li-6 + D -> Be-8, followed by Be-8 -> 2 He-4 are possible which are free of neutron and tritium emissions.

Biography

Thomas Passell has been an ACS member since 1954. He received a PhD from UC Berkeley's Department of Chemistry in 1954. His research thesis title was "Internal Conversion of Gamma Radiation in the L-Subshells".

Dr. Passell's employment history includes: Phillips Petroleum Co. Atomic Energy Division at the National Reactor Testing Station, Idaho Falls, ID; SRI International, Menlo Park, CA; Physics International, San Leandro, CA; Lockheed Palo Alto Research Laboratory; Electric Power Research Institute (EPRI), Nuclear Power Division, Palo Alto, CA; D2Fusion, Inc., Foster City, CA; Private Consulting Company, Palo Alto, CA.

Dr. Passell's research interests are numer-

ous with chemistry and physics technology as applied to industrial uses of atomic energy being a primary one. Major topics within this overall category include: beta and gamma ray spectroscopy; neutron activation analysis; radiochemical separations with emphasis on the transuranium and fission product elements; charged particle trapping in the geomagnetosphere; water chemistry of corrosion reduction in nuclear power plants; plasma diagnostics in hot fusion devices using magnetic compression; detection of chemical explosives in luggage and buried land mines; ion chromatography for corrosive ions at the part-per-billion level; pH control additives for corrosion reduction in high temperature water coolants in steam power systems; x-ray emission from nuclear fission devices in vacuum; calorimetry and He-4 measurements in electrochemical and glow discharge experiments on metals that absorb hydrogen; hydrogen storage for mobile applications; research project management for the electric utility industry.



Chair's Message

The summer is winding to a close and it is time to get back into the harness of work and school. The SCV picnic was a great event, attended by over 85 people. It's a fun event where we can celebrate our successes and the amazing people who

are the heart and soul of our section. In this note, I'd like to take note of two special individual's contributions to the ACS: Shirley Radding and Bryan Balazs.

This year, the ACS has started a new program, the ACS Fellow program. This program was created by the Board of Directors in December 2008 "to recognize members of the American Chemical Society for outstanding achievements in and contributions to Science, the Profession, and the Society." Unlike ACS national awards, the distinguished honor of a Fellows designation goes to those who have distinguished themselves in multiple areas, including promoting the science, the profession, and service to the American Chemical Society. I am very



pleased to announce that Shirley Radding will be in the inaugural class of ACS Fellows. Shirley has been a major force for the Santa Clara Valley Section of ACS over the last 30 years. Shirley is a founding member of the ACS Santa Clara Valley Local Section

and has served in most of the officer posts. Her service expanded to be the General Chair for several ACS Western Regional Meetings. Shirley was one of the first women chemists hired at the fledgling Stanford Research Institute (now SRI International) in 1948 in Menlo Park, CA, where she stayed the remainder of her 40-year scientific career. I am honored to have her in our section and thrilled to see her accomplishments and acknowledged by the ACS.

At our picnic this July, we also presented the 2009 Shirley Radding award to Bryan Balazs. This award is given by our section each year to recognize demonstrated, dedicated, unselfish leadership, service and significant contributions, over a sustained period of time,

to industrial or applied chemistry and to the American Chemical Society at local, regional and national levels. The award is named for Shirley B. Radding, charter member and long-time supporter of this section. Dr. Balazs has been a member of the American Chemical Society since 1987 and has made significant contributions to the Society for many years. He had headed up the Younger Chemists Committee for the California Section for a number of years and provides advice and guidance to the current chair of that Committee. He has been an enthusiastic participant of the California Section's National Chemistry Week. Bryan is the chair of SOCED (ACS Society Committee on Education) and is very involved with the Chemistry Olympiad program.

I am always impressed by the quality of people around me in the ACS, but I am also always happy that even small contributions to the section are appreciated and welcomed. So, please join me at our September dinner meeting, or at one of the many outreach programs we participate in each year. You will be amazed at how easy and fun it can be to participate in the ACS.

A CHF BOOK REVIEW

By Howard and Sally Peters

THE INVENTION OF AIR: A Story of Science, Faith, Revolution and the Birth of America by Stephen Johnson; Joseph Priestley: Minister, Inventor, Radical and “The First Green Chemist?”

The reader will find that much has been written over the years about the life of Joseph Priestley and his multi-faceted career as minister, inventor and radical. This new book by Stephen Johnson is an ambitious undertaking, and from these reviewers' viewpoint, he is successful in weaving a fascinating narrative. The 215-page book has only five chapters. It is not a biography or chronology and those needing that type of order may find the book scattered. The events of Priestley's life and times dance about from era to era and topic to topic, and Johnson is not shy about drawing surprising connections and conclusions.

Writing about Priestley is interesting. What do you do with this man who insists on being open with many about his cutting-edge scientific work? His view is open, sometimes aggressive about his dissenting faith in a country having a state religion, and holds unpopular political views. What do you do about with Joseph who constantly talks religion and politics? There are many good reasons why there are so few successful scientist-priest-politicians.

One can be reminded of Dr. Linus Pauling, the Cal Tech professor whose legendary work concerning the nature of the chemical bond earned one Nobel Prize, whose subsequent efforts supporting the nuclear weapon test ban earned the Nobel Peace Prize, and whose megavitamin theories, particularly concerning Vitamin C, revolutionized the supplement industry. He ended his career not at the then conservative Cal Tech in Pasadena, but in the halls of the Chemistry Department at Stanford in Palo Alto, CA.

It is instructive to explore Priestley's three-pronged genius.

The Minister: Priestley's humble beginnings required that he have the skills to earn a living for his eventual family of four children. His first position was as a language tutor (he received therapy in London to overcome a stammer and soon spoke six languages) and later as a teacher and minister. Priestley's first published book was *The Rudiments of Grammar*. He is consid-

ered to be one of the founders and primary advocates for the Unitarian Church. His marriage to Mary Wilkinson of the Bersham (later Birmingham) iron family was a happy one, but did not come with a large dowry. His book *History of Corruptions of Christianity* published in 1782 angered many, established him more solidly in religious circles, and received a very favorable reception from Thomas Jefferson. The eventual trip to Northumberland was also to explore establishing a new dissenting community on the Susquehanna.

The Scientist, Stephen Johnson's *The Discovery of Air* is not the first to suggest that Priestley's overriding contribution to science was the discovery of the interconnection between respiration (later oxygen) and photosynthesis (later carbon dioxide). Indeed, Priestley soon received the Royal Society's Copley Medal for reporting that interconnection, not for his later more well-known and controversial discovery of oxygen. Priestley and Benjamin Franklin corresponded about his research with the now classic mint and the mouse in the bell jar. Was Priestley the founder of the science of ecology and *Our First Green Chemist*? The answer is “Yes.” A reading of the book reinforces the fact that Priestley was viewed as a tireless experimentalist, a keen observer and not a rigorous theoretician. For example, Priestley stubbornly clung to the old “phlogiston” theory of why matter burned when the ample scientific evidence demonstrated that the theory was in error.

Priestley's inquiring mind and ambition at 32 propelled him in 1765 to continuing coffee-house meetings in the shadow of St. Paul's Church in London with the Honest Whigs, a loose group of free-thinking “electricians” including Benjamin Franklin, John Canon (of the Royal Society), and mathematician Richard Price. Priestley wanted permission and support to write a book summarizing the work of these “electricians” in English. The group was agreeable. When the 700-page *The History and Present State of Electricity, with Original Experiments* was published in 1767, Priestley's scientific reputation was solidified. The book would sell well and later become part of the standard natural philosophy curriculum at Yale and be a principal text on electricity for one hundred

years. It also popularized Franklin's famous (and dangerous) experiment with the kite, wire and key in the electrical storm.

About 1781 Priestley and his family moved to Birmingham where he would join the Lunar Society. The “Lunaticks”, as they playfully referred to themselves, included Josiah Wedgwood (potter to the Queen and also a grandfather of Charles Darwin), metal goods manufacturer Matthew Boulton, James Watt (inventor of the steam engine) and physician and naturalist Erasmus Darwin (also a grandfather of Charles Darwin). Priestley easily engaged the services of these men in his experiments and construction of much of his scientific equipment. Not many scientists have these eminent resources readily available.

Although beset with the usual financial problems of the English middle class, Priestley was not particularly interested in turning his scientific advances into financial gain. He was the first to observe that India rubber effectively removed “lead” pencil markings. He isolated and identified eight new gases. Priestley was the first to create and drink artificially created carbonated water. About 1772 he convinced the British Navy that carbonated water might be a cure for scurvy. So Captain Cook's ships were equipped with his water carbonation devices. (Carbonated water did not cure or prevent scurvy. Fortunately, the resourceful Cook had his own bitter-tasting natural “cocktail” containing enough ascorbic acid that it did work.) Priestley never patented anything, particularly the carbonation of water. The German watchmaker and amateur scientist, Johann Jacob Schweppe, read Priestley and Lavoisier's papers, experimented in Geneva and obtained a patent for carbonation of water in 1783. The rest is history.

The Radical: It was the confluence of the science, religion and politics of the time that was Priestley's eventual undoing in Britain. Ideally, when ideas and evidence clash, the result is hopefully a move to truth, a better understanding and a more orderly process. Not so. When the constitutional mob and clergy mob united in Birmingham in July of 1793, the Unitarian meetinghouses were first burned. Shortly, Priestley's home, library, laboratory and all scientific equipment were burned. The couple fled for their lives and would spend the next months moving furtively from one

continued on next page

Book Review, continued from previous page

safe house to the next. Priestley's unflappable nature took these events in stride and he moved on.

Because of his vocal support, Priestley earlier had been made an honorary citizen of France during the French Revolution but declined the offered move to France and an annuity. He (now as one of the most hated men in Britain) and Mary left Britain in exile on April 8, 1794 on the ship Samson requiring two stormy months to reach New York City. It would be more weeks before Priestley would learn that his old "oxygen" rival, Antoine Lavoisier, in France had been executed by the mob in May during its Reign of Terror.

On the Pennsylvania frontier, Priestley had built an imposing house, but his youngest son Harry died within a year and his wife Mary the following year. Priestley was able to continue his friendship with patriots, John Adams and Thomas Jefferson. This was a good move as the ever open and ever vocal Priestley was not shy about discussing and criticizing the new government of the United States. Under Adams' presidency the Alien and Sedition Acts were passed in 1798. Absent these personal connections, Priestley would probably have been in exile again. He would later gravitate

more into Jefferson's position as the Adams-Jefferson rivalry emerged and would cause their bitter break that would last more than a decade. When the tensions finally eased long after Priestley's death in 1804, the two old political lions reminisced together. Their exchange of letters until 1826 would include a few references to Ben Franklin and to George Washington. Joseph Priestley would be mentioned 52 times.

If you are a fan of the late James Mitchner's books and his sweeping style and prose, then you will enjoy this book. We did.

The Joseph Priestley Award is the highest award in American chemistry decided by the Board of Directors of the national American Chemical Society. Bowood House in Britain and the Priestley House in Northumberland, PA have been recognized as National Historic Chemical Landmarks (www.chemheritage.org)

Several reviews of this popular science book are on the web and can be located by searching "Invention Air Book Johnson". The www.amazon.com site includes a 20-minute pod cast interview. John reads about Priestley on National Public Radio at: www.npr.org/templates/story/story.php?storyId=99343668&ft=1&f=1033

And author Johnson's web site is: www.stevenberlinjohnson.com.

Dr. Howard Peters is a retired chemical patent attorney in the Silicon Valley of California.

Sally Peters is an information specialist at PARC Inc., Palo Alto, CA. They are members of the Joseph Priestley Society of the CHF. For years they have been one of a few husband-and-wife elected Councilors of the Council (of 500) of the National American Chemical Society.

The Peters' have visited the Priestley House in Northumberland, PA and stood at the Priestley gravesite in Riverview Cemetery. (Thirty paces away are the headstones of Howard's German great-great-great-great-great-grandparents: Nicholas and Barbara Paul - who were American contemporaries of Priestley).

Note:

There is a surprising connection of the Priestley family and the Richardson Romanesque architecture at Stanford.

A Priestley great-grand son Henry H. Robinson as an architect from Boston pioneered the Richardson Romanesque style. There is an urban legend that Leland and Jane Stanford visited Harvard University about a donation after the death of Leland Jr. and later visited Richardson's Boston office. Richardson died the next year of kidney disease but his renamed firm would build the original Stanford University Quad in Richardson Romanesque.

CHEMPLOYMENT ABSTRACTS AUGUST 2009

CHEMPLOYMENT ABSTRACT 3938

Position Title: Scientist, Small Molecule Drug Discovery

Job Description: This is an exciting opportunity for a synthetic organic chemist to participate in our innovative program in drug discovery. Successful candidates will be responsible for designing and synthesizing analogs for new targets during the hit to lead stage. The position requires an individual to address project biology and develop novel synthetic strategies.

QUALIFICATIONS DESIRED:

Education: This position requires a PhD in Organic Chemistry

Experience: The candidate must have 2-5 years of industrial experience in medicinal chemistry and a strong record of achievement. Experience in hit to lead projects and structure-based analog design is preferred.

LOCATION, SALARY, EMPLOYER DESCRIPTION:

Job Location: South San Francisco, CA

Salary: DOE

Employer Description: For more than 30 years, Genentech has been at the forefront of the biotechnology industry, using human genetic information to develop novel medicines for serious and life-threatening diseases. Today, Genentech is among the world's leading biotech companies, with multiple therapies on the market for cancer and other serious medical conditions. Please take this opportunity to learn about Genentech, where we believe that our employees are our most important asset.

Application Instructions: Genentech is dedicated to fostering an environment that is inclusive and encourages diversity of thought, style, skills and perspective. To learn more about our current opportunities, please visit: <http://careers.gene.com> and reference Req. #1000028009. Please use "Web - ChemEmployment" when a source is requested. Genentech is an Equal Opportunity Employer.

CHEMPLOYMENT ABSTRACT 3939

Position Title: Research Associate - Medicinal Chemistry

Job Description: Genentech has an exciting opportunity for a synthetic chemist to participate in our innovative program in small molecule drug discovery. The incumbent will be responsible for the design and synthesis of novel drug-like compounds. The position requires an individual that is highly motivated and excited to work in a collaborative environment.

QUALIFICATIONS DESIRED:

Education: This position requires a Bachelor's or Master's degree in Organic Chemistry

Experience: This position requires at least one year of experience in synthetic or medicinal chemistry. Demonstrated expertise in multi-step synthesis, compound purification and structural characterization is preferred.

LOCATION, SALARY, EMPLOYER DESCRIPTION:

Job Location: South San Francisco, CA

Salary: DOE

Employer Description: For more than 30 years, Genentech has been at the forefront of the biotechnology industry, using human genetic information to develop novel medicines for serious and life-threatening diseases.

Application Instructions: Genentech is dedicated to fostering an environment that is inclusive and encourages diversity of thought, style, skills and perspective. To learn more about our current opportunities, please visit: <http://careers.gene.com> and reference Req. #1000027360. Please use "Web - ChemEmployment" when a source is requested. Genentech is an Equal Opportunity Employer.



Lois Durham presents the Ottenberg Award to Peter Rusch



California Section Chair Eileen Nottoli



Picnickers enjoying food



Peter Rusch (right) presents the Radding Award to Bryan Balazs



A young chemist analyzes the cake



Photos from the Picnic and Awards Ceremony

By Karl Marhenke and Lois Durham



60-year member Cameron Ainsworth receives his certificate from Chair Elect Bruce Raby



60-year member Kirtland Mc Caleb



65-year member Bob Stutz



65-year member and ACS Fellow Shirley Radding



Janet and 50-year member Roy Hayter



Art Diaz, 50-year member



Robert Anderson, 50-year member



Charles Shaw, 50-year member



Melvin Ebeling, 50-year member



Ronald Orlowski, 50-year member



Ken Gottwald, 50-year member



SANTA CLARA VALLEY SECTION
AMERICAN CHEMICAL SOCIETY
P.O. Box 395, Palo Alto, CA 94302

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SANTA CLARA VALLEY SECTION

2009 Section Officers

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Chair-Elect	Bruce Raby	408-294-6718	alanice811@att.net
Past Chair	Mark Kent	408-736-0989	markkent@yahoo.com
Secretary	Karl Marhenke	831-688-4959	karlmar@armory.com
Treasurer	Ihab Darwish	650-594-1654	darwishis@yahoo.com

Councilors

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2007-2009	Sally Peters	650-812-4994	Sally.Peters@parc.com
2007-2009	Peter Rusch	650-961-8120	pfrusch@aol.com
2008-2010	George Lechner	408-226-7262	glechner@aol.com
2008-2010	Herb Silber	408-924-4954	hbsilber@science.sjsu.edu
2009-2011	Abby Kennedy	209-640-2005	akennedy@exelixis.com
2009-2011	Howard Peters	650-854-4614	peters4pa@sbcglobal.net
2009-2011	Ean Warren	650-329-4554	ewarren@scvacs.org

Alternate Councilors

2007-2009	Natalie McClure	650-906-7831	nmclure@drugregulatoryaffairs.com
2007-2009	Stephanie Gehling	408-429-9681	s_gehling@hotmail.com
2008-2010	Mark Kent	408-736-0989	markkent@yahoo.com
2009-2011	Ihab Darwish	650-594-1654	darwishis@yahoo.com
2009-2011	David Parker	408-615-4961	dparker@santaclaraca.gov
2009-2011	Bruce Raby	408-294-6718	alanice811@att.net
2009	Lois Durham	650-322-3507	ldurham9398@sbcglobal.net
2009	Harry Ungar	831-247-4545	haungar@cruzio.com

Newsletter

Editor:	Stephanie Gehling	408-429-9681	s_gehling@hotmail.com
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ChemPloyment Abstracts

Director:	Charles Sullivan	650-728-7034	cdansullivan@sbcglobal.net
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FUTURE MEETINGS

- Aug 16-20** 238th National ACS Meeting
Washington, DC
- Aug 23-28** 19th International Symposium
On Fluorine Chemistry
Jackson Hole, WY
[http://www.cbm.colostate.edu/shs/
General_Conference_Information.htm](http://www.cbm.colostate.edu/shs/General_Conference_Information.htm)
- Sep 17** Dr. Thomas O. Passell
EPRI
Developments in Cold Fusion
Biltmore Hotel, Santa Clara, CA
- Oct 4-6** Tactical Approaches to the Challenge
of Drug Failure
ACS ProSpectives Conference
Philadelphia, PA
<http://portal.acs.org/portal/acs/corg/content>
- Oct 15** Dr. E. Furukawa
Food Packaging
Biltmore Hotel, Santa Clara, CA
- Nov 19** Dr. Tom Lane
President, ACS
Community College Teaching Award