



# Double Bond

The Newsletter of the Western New York Section of the American Chemical Society

Volume 79

April 2007

## APRIL MEETING

### EDUCATION NIGHT BANQUET AND AWARDS DINNER

THURSDAY, APRIL 26, 2007

**RICH RENAISSANCE NIAGARA ATRIUM**  
One Robert Rich Way  
Buffalo, NY 14213

**6:30 PM Cash bar**

**7:00 PM Dinner**

Shrimp Bisque

Tuscan Chicken or

Slow Roasted Salmon w/ dill sauce or

Vegetable Gratin

Peach Melba

**7:30 PM Awards**

Chemistry Olympiad Awardees

Outstanding College Seniors

Distinguished High School Science Teacher

**8:30 PM Presentation**

**SHRI SHARMA, RICH PRODUCTS**

"Research of Non-dairy Toppings and Icing"

**All are welcome!**

Dinner: \$28/person Students: \$14

To make reservations, contact Alice Steltermann  
by April 20, 2007,

(716) 888-2340 or e-mail: [stelterm@canisius.edu](mailto:stelterm@canisius.edu).

## MAY MEETING

### NIAGARA FALLS POWER AUTHORITY TOUR

SATURDAY, MAY 12, 2007

Western New York Section Members are invited to join with their fellow ACS Members from the Rochester Section for a special tour and presentation at the Niagara Falls Power Authority.

Lunch at the Red Coach Inn in Niagara Falls and bus transportation to the Power Authority is being organized to make the event relaxing and to give members from these two neighboring sections a chance to socialize.

For details see the notice on p. 3 and on our website: [membership.acs.org/W/WNY/speaker.html](http://membership.acs.org/W/WNY/speaker.html)

## FROM THE EDITOR

Greetings Western New York,

There are good things happening in the local section this spring, so read on, WNY ACS members. The events outlined on the front page are elaborated starting on p 2.

Also look for the Call for Nominations for local section officers on p. 2. It is important that we hear from anyone who is interested in getting involved with the leadership and activities of the section. Nominate yourself or just contact us to drop a dime on a friend.

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**MIDDLE SCHOOL SCIENCE BOWL****WINNERS ADVANCE TO NATIONAL**

The Western New York Section is a co-sponsor of the Middle School Science Bowl sponsored by the U.S. Department of Energy. On March 17, 2007 teams of 7<sup>th</sup> and 8<sup>th</sup> graders from area schools competed at the Buffalo Museum of Science at the regional level, with the winner advancing to the national competition.

The competition consists of two parts: an academic competition where teams go head-to-head for toss-up and bonus questions, and a fuel cell car race competition. The U.S. DOE supplies the fuel cells and model car components and the students build and race the cars.

The team from St. Christopher's School in Tonawanda, NY won the overall competition, while a team from Nativity School of Orchard Park, NY won the car race competition. Others teams that placed in the competition were East Aurora Middle School and Westminster Community Charter School in Buffalo, NY.

The St. Christopher team, under the direction of teacher Celeste Scarozza, will now advance to the national level in Denver, CO, June 21-24, 2007. All expenses for the trip are covered by the U.S. DOE.

The competition was organized and staffed by local ACS members from Honeywell and Canisius College.

**CALL FOR OFFICER NOMINATIONS**

The WNY local section of the ACS is actively seeking nominations for the following executive officer positions for terms starting January 2008:

Chair  
Chair-elect  
Vice Chair  
Treasurer  
Councilor  
Member-at-large

If you are interested in becoming more active in our section contact the current executives (see list on the last page) or just nominate yourself.

A short biographical sketch for each candidate (50-150 words) will be published with the ballot in an upcoming issue of the *Double Bond*. You can submit such a blurb with the nomination, or else it will be solicited at a later time.

Elected officers must be members of the ACS. Nominations should be sent, before May 31, 2007, to the editor, Timothy Gregg: [greggt@canisius.edu](mailto:greggt@canisius.edu).

or c/o Department of Chemistry, Canisius College, Buffalo, NY 14208-1098.

Please remember to include your contact information.

**EDUCATION NIGHT 2007****Distinguished High School Science Teacher**

The 2007 Outstanding High School Science Teacher Award winner is Mrs. Angela Riordan from Clarence High School. Mrs. Riordan received a B.A. in Biology from Canisius College in 1980 and her M. Ed. in Science Education from SUNY Buffalo in 1985. After teaching at the Buffalo Academy of the Sacred Heart, her alma mater, from 1982-1985 and again from 1990-1992, Mrs. Riordan taught at Frontier High School (1993-1996) before moving to Clarence High School in 1996 where she teaches Regents Biology and General Chemistry. Her many awards include: Finalist "New York State Teacher of the Year" 1995, WGRZ (NY State Lottery) "Educator of the Week", October 2003 and "Who's Who Among America's Teachers" 1992, 2000, 2004.

Please join us on April 26, 2007 at the Rich Atrium when we honor Mrs. Riordan, the Chemistry Olympiad students and the outstanding college students majoring in chemistry and related fields at this year's Education Night Awards dinner.

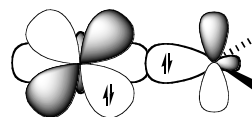
To reserve space call Alice Steltermann at 888-2340 between 8:30 AM and 3:00 PM by April 20<sup>th</sup>. The cost is \$28.00, or \$14.00 for students.

**Chemistry Olympiad Winners, Schools, Teachers**

<i>Student</i>	<i>School</i>	<i>Teacher</i>
Matthew Conway	St. Joseph's Coll Inst	Mr. Matthew Hellerer
Brian Chmielowiec	St. Joseph's Coll Inst	Mr. Matthew Hellerer
Elizabeth Peng	Williamsville South	Dr. Kenneth Licata
Eric Przybyszewski	Williamsville North	Mrs. Colleen Sowinski
Jerome Luo	Williamsville East	Mr. David Fabio
Billy Wiczorek	Amherst Central	Mr. Dennis Bauer
Sam Suggs	Amherst Central	Mr. Dennis Bauer
Patrick Hurley	City Honors	Ms. Valerie Davis
James Rood	Letchworth Central	Mr. Thomas Rycroft

**Outstanding College Students of the Year**

<i>Student</i>	<i>Major</i>	<i>College</i>
Michael Kawa	Chemistry	Buffalo State College
Matthew J. Waitner	Chemistry	Canisius College
Patrick M. Nugent	Biochemistry	Canisius College
Vincent M. Carroll	Chemistry	Niagara University
Jennifer Novobilski	Biochemistry	Niagara University
Rachael Brust	Biochemistry	University at Buffalo
Joseph Morgan	Chemistry	University at Buffalo
Joel Urena	Medicinal Chem	University at Buffalo
Christine Balonek	Chem & Biol Eng	University at Buffalo





**SAVE THE DATE: SATURDAY, MAY 12<sup>TH</sup>, 2007**

**Western New York Section Members  
are invited to join with their fellow ACS Members from  
the Rochester Section for a special event at the  
Niagara Falls Power Authority**

This 1-day event will enable members from our two neighboring Sections to socialize over lunch and then enjoy a special presentation and overview of this famous location.

The cost is \$15.00 per member. WNY-ACS Students and Senior Chemists will pay \$7.50. A one guest limit is in place at a cost of \$15.00. Please make checks out to Western New York Section of the ACS.

**The price includes:**

- Buffet lunch at the Red Coach Inn (2 Buffalo Avenue, Niagara Falls, NY) overlooking Niagara Falls includes
  - Black Angus Beef Tips and Roasted Turkey
  - Garden Salad and Fruit Salad
- Bus transportation between the Red Coach Inn and NFPA.
- All entrance fees, Special Presentations and Power Authority Escort

**IMPORTANT**

**Lunch starting at 11:30 – 12:00. We are limited to 27 people. First come, first serve based on sign up. We will offer a wait-list should openings become available. If you cannot attend lunch, please meet us at the NFPA at 1:30 pm at no cost (NFPA is at 5777 Lewiston Road, Lewiston, NY).**

**For information on the exciting things awaiting you at the Power Authority, visit their website at: [www.nypa.gov/vc/niagara.htm](http://www.nypa.gov/vc/niagara.htm)**

To make your lunch reservation, please return the attached form.  
To meet us at the Power Authority, please contact Alice Steltermann at  
[stelterm@canisius.edu](mailto:stelterm@canisius.edu) or 716-888-2340  
**RESERVATIONS ARE REQUIRED FOR BOTH EVENTS!**

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**Niagara Falls Power Authority Tour Reservation Form**  
**May 12, 2007**

**LUNCH AND BUS RIDE:                    \$15.00 (or \$7.50 Students/Senior Chemists)**

**FOR POWER AUTHORITY TOUR: No charge (if only attending tour, email [stelter@canisius.edu](mailto:stelter@canisius.edu) or call Alice at 716-888-2340)**

**ACS Member Name:** \_\_\_\_\_

**Guest Name:** \_\_\_\_\_ (limit of 1)

**Member Address:** \_\_\_\_\_  
\_\_\_\_\_

**email address:** \_\_\_\_\_

**Telephone Numbers: (work) \_\_\_\_\_(home) \_\_\_\_\_**

**Contact Information: (In case we need to contact someone on your behalf)**

**NAME:** \_\_\_\_\_

**TELEPHONE:** \_\_\_\_\_

**Total amount enclosed as check or money order:     \$ \_\_\_\_\_**

**Policies:**

- There is no smoking in the motorcoach.
- The Bus Company and the Western New York and Rochester Sections, ACS will not be held responsible for these vehicles.
- Every effort is made to stay on the announced schedule. However, the Western New York and Rochester Sections, ACS and the Bus Company may not be held responsible for delays caused by weather, road conditions or transportation equipment. We also reserve the right to make changes to the itinerary as needed.
- In the event of a cancellation or major change, you will be notified.
- Advance notice is required for preferred seating for handicap considerations. Every effort will be made to accommodate your request, but we cannot guarantee a specific seating location.

\*\*\*\* In requesting this reservation, I agree to the policies stated above. \*\*\*\*

Signature of ACS Member: \_\_\_\_\_

Remit form to:

Alice Steltermann, Dept of Chemistry/Biochemistry, Canisius College, Buffalo NY 14208

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**THIS MONTH IN CHEMICAL HISTORY**

Harold Goldwhite, California State University,  
Los Angeles ([hgoldwh@calstatela.edu](mailto:hgoldwh@calstatela.edu))

I don't want my readers to get the wrong idea; I do read books other than those featuring old science. In fact I read many mystery stories, and perhaps one day I'll write some columns about an interest of mine in scientific detectives in mystery fiction. But not today. The opening of this column was inspired by my reading recently "Lelia: The Life of George Sand" by Andre Maurois, translated by Gerard Hopkins (Penguin Books, London, 1977). The life story of the great French woman novelist is splendidly presented in this book, including her liaisons with many distinguished men in the arts including Chopin. But my attention was caught by references to a man who was not one of Sand's lovers, but was a distinguished 19<sup>th</sup> century chemist.

"George Sand's Diary, February 12th., 1866: Dinner at Magny's dinner with my 'pals'. Their welcome could not have been warmer. They were all very brilliant except Berthelot, the great scientist ... April 9th. 1866; Our Magny dinner with all the pals.... Berthelot did not open his lips. He and I exchanged not a single word."

Perhaps Marcelin Berthelot was overawed by the brilliance of the literary ensemble at those dinners which included Edmond and Jules Goncourt, Gautier, Flaubert, Taine, Renan, and Sainte-Beuve among others.

Berthelot (not to be confused with Lavoisier's contemporary and colleague Claude-Louis Berthollet) was indeed a great scientist. My account of his career draws on the Berthelot memorial lecture, delivered by Harold Bailey Dixon, a pioneer in reaction kinetics, to the Chemical Society of London on November 23, 1911.

Berthelot was born in Paris on October 25, 1827 and died, also in Paris, on March 18, 1907. His father was a physician and his parents sent their precocious son to a distinguished school, the College Henri IV, where he won the highest prizes in competition with scholars from all over Paris. His education was rich in the classics, but he decided to study natural sciences at university. He completed the full medical course but also worked at chemistry in the laboratory of Pelouze, a pioneer in natural products chemistry. He was appointed in 1851 as lecture assistant at the College de France to Ballard, who discovered bromine. He earned his doctorate in three years with a thesis "On the Combinations of Glycerine with Acids, and on the Synthesis of the Immediate Principles of Animal Fats". Organic chemistry was now his chosen domain.

The next few years saw successions of successes in this field. Studies of the chemistry of sugars were followed in 1855 by the earliest of his papers on the total

syntheses of organic compounds from simple building blocks: ethanol from ethylene; and formic acid from carbon monoxide. He followed this up with syntheses of hydrocarbons, methanol, and oxalic acid. Passage of hydrogen through a carbon arc yielded acetylene which could be elaborated into more complex organic compounds and also trimerized to benzene, parent of the aromatics. These syntheses of organic compounds from relatively simple starting molecules were perhaps the true death of the vitalism doctrine in organic chemistry. Berthelot was appointed Professor in the Ecole Superieure de Pharmacie in 1859 and lectured there, but continued his researches at the College de France. In 1860 his most famous book appeared: "Organic Chemistry founded on Synthesis." Wide recognition of Berthelot's talents soon followed; membership in the Academie des Sciences and in foreign chemical societies; prizes from the Academie, the Royal Society, and the Chemical Society of London.

In mid-career Berthelot turned to topics in physical chemistry. His studies of the ethanol/acetic acid/ethyl acetate/water system with his student St. Gilles were among the earliest of both reaction kinetics and equilibrium. He also studied the partition of solutes between immiscible solvents. But his great work in this area was in thermochemistry. From 1863 until 1879 he and his students established the thermochemical data for hosts of reacting systems which he published in two major books. He enunciated his (incorrect) "principle of maximum work" that every chemical system reacts to produce the maximum amount of heat energy – which ignores what we now know of the effects of entropy. But that was a considerably later notion. Berthelot also made important contributions both theoretical and practical to the study of explosions. Berthelot became a public figure in France during the siege of Paris in 1870. His expertise in chemistry led to his appointment as President of the Scientific Committee of National Defence and, like his great predecessor Lavoisier at the time of the French Revolution, he helped improve the manufacture of explosives to be used in the French army. He was appointed as Inspector of Higher Education in 1876 and was then elected a Permanent Senator in 1881. He was appointed to his first Cabinet Post in 1886 as Minister of Public Instruction. His own background led him to an appreciation of the value of scientific education and he encouraged the incorporation of scientific subjects into the standard classical and liberal arts curriculum. He was not enthusiastic about "technical education" isolated from the broader curriculum, but he did support evening schools in a wide range of subjects for workers. In 1895 he was persuaded to become Minister for Foreign Affairs in the cabinet of M. Bourgeois. Although the task was not to his taste he did negotiate a tricky Anglo-French

*(continued on p 4)*

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## 60 YEARS AGO IN THE DOUBLE BOND

*Excerpts from the April, 1947 summary of the February meeting.*

### ANESTHESIA A TIDE IN THE AFFAIRS OF MEN

John C. Krantz, Jr. of the Department of Pharmacology, School of Medicine, University of Maryland, spoke on the subject "Anesthesia" at the February meeting of the Western New York Section of the American Chemical Society...

William Morton, a dentist in Boston, is credited with the successful introduction of surgical anesthesia and following the suggestion of Dr. Charles T. Jackson, a chemist, tested ethyl ether for dental operations. Results were so highly encouraging that he soon arranged to demonstrate its effect in a surgical operation at the Massachusetts General Hospital. Dr. John Collins Warren, an eminent surgeon of that day, performed the operation and unqualifiedly subscribed to its use. During the ensuing year the Massachusetts General Hospital used ether anesthesia in all serious operations and other hospitals slowly took up its use.

Meanwhile in England James Young Simpson, Professor of Midwifery at Edinburgh, searching for an agent to ease the pain of childbirth, uncovered chloroform in 1847 and developed the technique of "twilight" sleep. Considerable clerical opposition arose to the use of anesthesia in obstetrics and it was not until Queen Victoria allowed chloroform to be used for the birth of her seventh son, that this phase of anesthesia was generally accepted.

Up to 1922 nitrous oxide, ether and chloroform were the only anesthetics known...

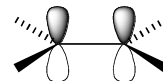
The use of ethylene as anesthesia was tested in 1922 and, although it possessed advantages of diminished after-effects, it had to be employed in 90% concentration in air, with resultant danger of asphyxia to the patient. It was not until some years later that Lucas and Henderson introduced cyclopropane, which is effective in a concentration of 15% in air, thus conserving the patient. In 1927 "Avertin" or tribromethanol was developed in Germany and found to be a powerful anesthetic when used with nitrous oxide in the ratio of 2 to 1. Merck, in 1933, introduced divinyl ether, which is very effective, but causes liver damage on repeated administration.

Dr. Krantz continued by describing some of the compounds and techniques that he has had part in developing. Among these compounds may be listed the aliphatic cyclopropyl ethers and isopropyl vinyl ether. For evaluating new anesthetics, in addition to the standardized tests with laboratory animals for toxicity, a quantitative "anesthetic index" technique has been developed. It involves the determination of the quantity of agent per unit of body weight required to produce satisfactory relaxation of abdominal muscles and extremities and the quantity required to kill. The ratio of the latter quantity over the amount causing anesthesia is the anesthetic index, greater the number the safer is the

anesthetic. Some representative indices are: Chloroform 1.3; ethyl ether 2; isopropyl vinyl ether 4.

In conclusion, Dr. Krantz pointed out that in spite of the theories advanced, research in this field is still largely "make and try". Thus no one has been able to explain why those compounds which have been useful anesthetics, inactivate the cerebral cortex and the spinal cord, but skip the medullary center which controls respiration and heart rate.

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### THIS MONTH IN CHEMICAL HISTORY (continued from p. 5)

treaty settling the status and boundaries of the territory then known as Siam, a buffer between the French colony of Indo-China and the English colony of Burma. Soon after the treaty was signed Berthelot resigned this position.

During a visit to Egypt in 1869 his hosts showed him a range of papyri, many in old Greek, which described ancient preparations that could be categorized as early chemistry and alchemy. They caught his interest, perhaps because of his early training in classic Greek and Latin, and he enlisted the aid of several colleagues including Ruelle, Duval, and Houdas to translate and publish an extensive collection of manuscripts covering practical chemistry and alchemy as reflected in early work by Greek and Arabic alchemists, and by medieval alchemists. These translations are still among the best sources for our knowledge of these periods in the early history of chemistry. The Leiden Papyrus is perhaps the best known of these. It was compiled about 300 A.D. and is probably based on an earlier collection dating to about 30 B.C. It contains many recipes for producing what we would call fake gold and gems, but one must understand that criteria and tests for purity were quite primitive in those times.

Berthelot's wife was literally blown into his arms. Sophie Niaudet was crossing the Pont Neuf in Paris during a wind storm when a particularly strong gust, catching her long skirt and large hat, unbalanced her and Marcelin was in the right place to catch her. It turned out that their families were well acquainted. They were married in 1861 and stayed happily married for over forty years. They died on the same day within an hour of each other, and were given the honor of a double state burial in the Pantheon.

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**ISSUE COPY DEADLINE: FIRST OF MONTH PRIOR TO PUBLICATION**

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