THE Indicator

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Dr. Landon Greene

2017 North Jersey Section Chair

See Chair's Message on page 5.

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THIS MONTH IN CHEMICAL HISTORY

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

In recent columns I drew to your attention a new book about the history of chemistry. called "The Chemistry Book" by Derek B. Lowe, published by Sterling in 2016. Its subtitle is "From gunpowder to graphene; 250 milestones in the history of chemistry". One of the book's most attractive features is that each one page article is accompanied by a full page illustration, mostly in color, relevant to the milestone described. One final column on this work, with much more recent examples, now follows.

Let's turn to 1932, and the isolation of Vitamin C. The condition known as scurvy, due to a Vitamin C deficiency, has been known since as early as 400 BCE. It particularly afflicted sailors on long voyages and was of great concern to the British Admiralty in those days when "Britain Ruled the Waves" as the song "Rule Britannia" tells us. Many "cures" for scurvy were proposed. In fact, when Joseph Priestley "invented" soda water in the 18th. century he proposed it as a cure for scurvy! Around that same time the Scottish physician James Lind ran tests on various acids that he thought would cure scurvy. Vinegar was ineffective, but citrus juices did the trick. The Admiralty finally followed up his discovery, and on future voyages of the Royal Navy supplies of oranges, lemons, and limes were made standard issue. Hence the nickname of "limeys" for British sailors – and other Brits.

In the 1920s the Hungarian Albert Szent-Gyorgi was trying to isolate the actual agent in citrus that was the curative ingredient. He finally obtained small amounts of a six-carbon material that he named ascorbic (anti-scurvy) acid. But attempts to obtain larger quantities from citrus fruits were vitiated by the presence of many other similar compounds. The story goes that while he was in a period of major frustration his wife served up a dish of that Hungarian favorite, red peppers. He realized that he hadn't tested red peppers for ascorbic acid. They turned out to be an extremely rich source; within a few weeks he had kilogram amounts of pure Vitamin C. And in 1937 he won a Nobel prize for his work.

In 1935 the Du Pont experimental station's team on synthetic fibers was headed by a young chemist, Wallace Hume Carothers. Back in those times some American chemical companies actually supported exploratory basic chemistry, without always worrying about the immediate bottom line. At that period two important synthetic polymers were known: bakelite, invented early in the 20th. century; and polyethylene, discovered in 1933 but not yet in production. Neither one seemed to be a promising candidate for making fibers. The Carothers group had already had one big success with neoprene, a synthetic rubber. They now turned to polyamide synthesis, varying the length of the carbon chain between the amide groups In 1935 they came up with their big winner: the polyamide with a 6 carbon chain between amide groups. This material could be drawn into fibers that were uniform, strong, and silky in feel. They named it nylon. Within 3 years nylon fiber was being made on an industrial scale by Dupont – just before World War II broke out. For the first few years most nylon went into parachute manufacture, but after the war the demand for nylon fabrics, particularly in women's stockings ("nylons") soared.

In 1936 the IG Farben chemist, Gerhard Schrader and his associates, were investigating a novel class of insecticides, a set of compounds based on phosphorus esters and amides containing a P-F bond. They experienced alarming symptoms including a fading of their vision, and chest constrictions. They quickly left the lab. – a wise decision. They had prepared Tabun, a deadly nerve gas. Further studies were strongly supported by the German War Department, and the mode of action of Tabun and similar compounds was soon established. They inhibited the action of the cholinesterase enzyme thus interfering with nerve impulse transmission – hence nerve gases. During World War II both the Germans and the Allies made significant amounts of nerve gases and initiated research programs on these agents. They were never used during that war, perhaps because of the expectation of retaliation in kind. International treaties have banned their use, but occasional incidents of suspected and actual nerve gas used have surfaced from time to time. A final personal note; I was a Ph. D. student at Cambridge University in the U.K. working with Dr. B. C. Saunders who took part during World War II in the British nerve gas program.

(See second article by Harold Goldwhite on page 24.)

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THE Indicator

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The Indicator is posted to the web around the 15th of the previous month at

www.TheIndicator.org

Deadline for items to be included in the February 2017 issue of _The Indicator_ is

December 28, 2016

2017 North Jersey Section Chair's Message

Thank you all for the opportunity to serve as the 2017 Chair of the North Jersey Section of the ACS. I am honored to have the luxury of leading forward a very successful and impactful section. I would like to thank all our leaders, volunteers, members and community for what they have done to make this section great. I am confident, with such a strong program, we can improve upon this success in 2017.

Our section continues to have the vision to "...improve people's lives through the transforming power of science." As your Chair, I support this vision and believe it is my duty to empower our section to do so. My top priority this year will be to engage our members and community to help empower them in their scientific pursuits, to fulfill our vision.

My focus this year will be around the following strategic goals:

- Engage our members to understand and support their interests in ACS. Foster their career and professional development.
- Improve the sustainability of our section through actively recruiting future leaders and improving communication.
- Promote the public recognition and appreciation of chemists and chemistry by supporting educational and community outreach programs.
- Increase section membership by enhancing our programs and supporting the interests of our constituents.

These goals align with the strategic plan for ACS and the North Jersey Section. These goals will be achieved by implementing several new initiatives and enhancing those already in place. Most importantly, these goals will strengthen our events. Events this year include (but are not limited to):

- Professional activities: Topical groups' seminars/symposia, Baekeland Award Symposium, Careers in Transition meetings
- Educational programs: National Chemistry Week at the Liberty Science Center, Chemistry Olympiad, Earth Day activities
- Community outreach: Project SEED, street fairs, Community Nights at the Liberty Science Center

For more events and information please visit us at **www.njacs.org** and follow us on Facebook.

This year, I look forward to communicating with all of you and I encourage you to be involved in some of our events. Please feel free to contact me with any thoughts, ideas, or suggestions at **landon8399@yahoo.com**.

Sincerely,

Landon Greene, PhD
2017 Chair, North Jersey Section ACS

2017 WILLIAM H. NICHOLS MEDAL DISTINGUISHED SYMPOSIUM AND AWARD DINNER

Symposium: IMPROVING LIFE THROUGH ADVANCES IN CHEMISTRY AND NANOSCIENCE

Award Recipient: **PROFESSOR CHAD A. MIRKIN**
Northwestern University

Date: **Friday, March 24, 2017**

Time: 12:30 PM Registration 1:00 PM – 5:30 PM Symposium
5:45 PM Reception 6:45 PM Award Dinner

Place: Crowne Plaza Hotel, White Plains, NY

PROGRAM

1:00 PM Welcome — Professor Brian R. Gibney, 2017 Chair, ACS, New York Section, Brooklyn College and Graduate Center of CUNY

1:05 PM Opening of the Distinguished Symposium — Professor Joseph M. Serafin, 2017 Chair-elect, ACS, New York Section, St. John's University

1:15 PM Dynamic Droplets: Biosensors from Changes in Orientation and Morphology of Complex Liquids — Professor Timothy M. Swager, Massachusetts Insitute of Technology

Protein kinases are critical players in intracellular signal transduction pathways and the etiology of many human diseases. Over the last three decades, our understanding of this biological target class has grown such that there are now ca. 25 kinase inhibitors on the market, predominantly for the treatment of cancer. This presentation will describe the evolution of kinase drug discovery and development using several clinical candidate case histories to highlight key past milestones and future challenges.

2:00 PM Molecular Imaging of Transition Metal Signaling in the Brain and Beyond — Professor Christopher J. Chang, University of California, Berkeley

Metals are essential for all forms of life, and the traditional view of this bioinorganic chemistry is that mobile fluxes of alkali and alkaline earth metals like sodium, potassium, and calcium are used as dynamic signals and transition metals like copper and iron must be buried and protected as static metabolic cofactors to prevent oxidative stress. We have identified a new paradigm of transition metal signaling, using copper as a primary example to show how such elements can influence neural circuitry and regulate fundamental behaviors such as eating and sleeping.

2:45 PM Shape-Shifting Drug Carriers for Targeting Cytotoxins and Immunotherapeutics to Cancer — Professor Nathan C. Gianneschi, University of California, San Diego

Nanoparticle targeting strategies have largely relied on the use of surface conjugated ligands designed to bind overexpressed cell-membrane receptors associated with a given cell-type. We envisioned a targeting strategy that would lead to an active accumulation of nanoparticles by virtue of a supramolecular assembly event specific to tumor tissue, occurring in response to a specific signal. For this purpose, we utilize enzymes as stimuli, rather than other recognition events, because they are uniquely capable of propagating a signal via catalytic amplification. We will describe the preparation of highly functionalized polymer scaffolds utilizing ring opening metathesis polymerization, their development as in vivo probes and their utility as a multimodal imaging platform and as drug carriers capable of targeting tissue. Furthermore, we will describe new methods and approaches for characterizing this kind of dynamic material at the nanoscale, including by liquid cell transmission electron microscopy and combined isotopic and optical nanoscopy.

3:30 PM Coffee Break

4:00 PM Metal-oxos in Chemistry and Biology — Professor Harry B Gray, California Institute of Technology

The dianionic oxo ligand occupies a very special place in coordination chemistry, owing to its ability to stabilize high oxidation states of metals. The ligand field theory of multiple bonding in metal-oxos was published in two papers in the first volume of Inorganic Chemistry. The theory, which accounts for the ground state electronic structures and spectroscopic properties of these complexes, predicts that an "oxo wall" separates Fe-Ru-Os and Co-Rh-Ir in the periodic table. I will review this early work, then discuss the roles metal-oxos play in two of the most important chemical reactions on planet Earth, hydrocarbon oxygenation catalyzed by cytochrome P450, and solar-driven water oxidation catalyzed by photosystem-II.

4:45 PM Unlocking the Potential of Spherical Nucleic Acids in Biology and Medicine — Professor Chad A. Mirkin, NICHOLS MEDALIST

A fundamental tenet of nanotechnology is that bulk materials, when miniaturized, exhibit new and interesting chemical and physical properties. These properties often positively impact the development of new technologies, especially in the areas of biology and medicine where frontier advances require rapid changes in how living systems are probed and regulated. Spherical nucleic acids (SNAs), nanostructures typically made by chemically templating short strands of DNA or RNA on the surface of a particle, display extraordinary architecture-dependent properties. Unlike conventional nucleic acids, SNAs can rapidly enter cells without the need for transfection agents, and they can be utilized as novel intracellular probes and efficacious agents for regulating gene expression and immune system response. Consequently, SNAs constitute an entire new class of therapeutics that are being utilized to attack diseases and disorders, including autoimmune diseases and many forms of cancer, at their genetic roots.

5:45 PM Social Hour

6:45 PM William H. Nichols Medal Award Dinner — Professor Harry B. Gray will introduce Professor Mirkin, Nichols Medalist

More information on the William H. Nichols Medal Events is available on the New York Section's website at **http://www.NewYorkACS.org**.

Tickets may be reserved using the following form, or preferably through the New York Section website that accepts credit cards or Paypal. **http://www.NewYorkACS.org**.

********** **RESERVATION FORM** **********

2017 WILLIAM H. NICHOLS DISTINGUISHED SYMPOSIUM & MEDAL AWARD BANQUET in honor of Professor Chad A. Mirkin

Return to: ACS, New York Section, c/o Dr. Neil D. Jespersen, Department of Chemistry, St. John's University, 8000 Utopia Parkway, Queens, NY 11439 (516) 883-7510

Please reserve
_____ places for the symposium & banquet at $125/person ACS member
_____ places for the symposium only at $45/person ACS member
_____ places for the banquet only at $115/person ACS member

_____ places for the symposium & banquet at $155/person Non-member
_____ places for the symposium only at $65/person Non-member
_____ places for the banquet only at $125/person Non-member

_____ places for the symposium only at $30/person, Students, Retired, Unemployed
_____ places for the symposium only complimentary - for 50 year + ACS members

(For table reservations of 8 or more, use the ACS member $125/person rate for combination tickets)

Reserve a table in the name of: _____

Names of Guests	E-mail Address
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Indicate numbers in your group who choose:
Chicken _____
Prime Rib _____
Salmon _____
Vegetarian _____

Mail Tickets to:
Name: _____
Address: _____
_____
_____

BANQUET RESERVATION DEADLINE: MARCH 13, 2017

Please make checks payable to: ACS, NEW YORK SECTION Check for $_____enclosed

NEW YORK SECTION — 2017 SECTION-WIDE CONFERENCE

Please register at: **http://www.newyorkacs.org/meetings/sectionwide/sectionwide2017.php**

Date: **Saturday, January 21, 2017**

Times: 9:30AM – 1:00PM

Place: Queensborough Community College - CUNY, 222-05 56th St., Bayside, NY Oakland Bldg.

Directions: **http://www.qcc.cuny.edu/about/getting-here.html**

Map of Campus: **http://www.qcc.cuny.edu/about/campus-map.html**

Cost: FREE TO ALL

PROGRAM

9:30 AM	**Arrival and Refreshments**	
10:00 AM	**Greetings from the New York ACS 2017 Chair**	Dr. Brian R. Gibney
10:10 AM	**Award Presentations**	
	Service Plaque and Pin to the 2016 New York Section Chair	Dr. Alison G. Hyslop
	New York Section Outstanding Service Award for 2016	Dr. Paris Svoronos
	Nichols Foundation H.S. Chemistry Teacher Award for 2016	Ms. Kristyn Pluchino Stuyvesant High School NYC
10:30 AM	**Presentation of Candidates for the 2017 Elections**	Dr. Joseph M. Serafin 2017 Chair-elect ACS New York Section
10:45 AM	**Keynote Speaker**	Professor Rein Ulijn Director, ASRC Nanoscience Initiative City University of New York New York, NY

Title: Peptide Nanotechnology: Building on the Building Blocks of Life

11:45 AM **Coffee Break** — Poster presentations by the New York Section Project SEED Students.

12:00 PM **ACS, New York Section Committee Planning Sessions for 2017**

Educational Activities: (Chemagination, Chemists Celebrate Earth Day, Continuing Education, High School Olympiad, National Chemistry Week, Nichols Foundation H.S. Teacher Award, Project SEED, Student Membership Activities (URS))

Chair: Dr. Alison G. Hyslop

Member Affairs: (ACS Fellows, Awards, Employment and Professional Relations, History of the New York Section, *The Indicator*, Membership, Outstanding Service Award)

Chair: Dr. Ralph Stephani

Program Review: (Subsection and Topical Discussion Group Chairs)

Chair: Dr. Anne T. O'Brien

Public Affairs: (Academe and Industrial Relations, Environmental Chemistry, Fund Raising, Government Affairs, Information Technology, Public Relations, Speakers Bureau)

Chair: Dr. Robert P. Nolan

12:45 PM **Reports from the Chairs of the Committee Planning Sessions**

1:00 PM **Conclusion of the Meeting.** Join with colleagues for lunch at a local restaurant.

To inquire about the Section-wide Conference, please call the New York Section Office at (516) 883-7510 or e-mail Marilyn Jespersen, New York ACS Office Administrator, at: **njesper1@optonline.net**

New York Meetings

www.newyorkacs.org

NEW YORK SECTION BOARD MEETING DATES FOR 2017

The dates for the Board Meetings of the ACS New York Section for 2017 have been selected and approved. The meetings are open to all – everybody is welcome. All non-board members who would like to attend any of the meetings should inform the New York Section office by emailing Mrs. Marilyn Jespersen at **njesper1@optonline.net** or by calling the Section office at (516) 883-7510.

All 2017 Board Meetings will be held at The Graduate Center, Science Center, Room 4102, 365 Fifth Avenue, New York, NY 10016, except for the January 21 Section-wide Conference and March 24 Nichols Symposium. Prof. Brian Gibney will chair all meetings. Refreshments will be available starting at 6:00 PM while the actual meeting will start at exactly 6:30 PM.

The board meetings dates for 2017 will be

Saturday, January 21, 2017 — January Sectionwide Conference at Queensborough Community College - CUNY, 222-05 56th Street, Bayside, NY, Oakland Building.

Friday, February 10, 2017

Friday, March 24, 2017 — William H. Nichols Symposium and Medal Award Dinner at the Crowne Plaza Hotel, White Plains, NY.

Friday, April 28, 2017

Friday, June 9, 2017

Friday, September 15, 2017

Friday, November 17, 2017

More information will be posted in future monthly issues of *The Indicator* and on the New York website at

http://www.NewYorkACS.org.

CHEMICAL MARKETING & ECONOMICS GROUP

Chemical Industry Micro and Macroeconomic Outlook

Speaker: G. Sam Samdani, PhD
Senior Industry Knowledge Exoert
McKinsey & Company

Date: Wednesday, January 11, 2017
Time: 11:15 AM - 2:00 PM
Place: Penn Club
30 West 44th Street
New York, NY

See flyers on page 8.

HIGH SCHOOL TEACHERS TOPICAL GROUP

How You Can Cover the Regents Chemistry Curriculum with Significant Time Constraints

Speaker: Tehilla P. Rieser
SAR High School
503 West 259th Street
Riverdale, NY

***** NOTE: DIFFERENT DAY – WEDNESDAY *****

Date: Wednesday, January 18, 2017
Time: Social and Dinner — 5:45 PM
Meeting — 7:15 PM
Place: Social and Dinner — See below.
Meeting — SAR High School
503 West 259th Street
Riverdale, NY

Directions: To get to SAR High School, take the #1 train to 231th (which has an elevator) and the Bx7 or Bx10 bus to 259th and the school. (The Bx7 takes a slightly shorter route.) There are very few stops between 238th and 259th so the trip is quite fast. On the way back, only the Bx10 bus goes all the way to the 231 subway station. The Bx7 turns south a long block before the station. SAR High School is 1/2 block west of the bus stop at 259th and Riverdale Avenue on the north side of 259th. There is free parking for drivers at the side of the school and there are four restaurants directly across the street: The Pizza Block, Dunkin' Donuts, Carlos & Gabby's (Mexican, 3.9 stars, **http://carlosandgabbysriverdale.com**), and the deluxe Riverdale K Grillhouse (4.3 stars, **http://www.kgrillhouse.com**). All are kosher (including DD). Carlos & Gabby's and the K Grill are on the SW corner of the intersection. Dunkin' Donuts and Pizza Block are in the shopping center across 259th (south) of the school. Parking is on the west side of the school building. Do NOT park in the large shopping center lot.

CHEMICAL INDUSTRY MICRO AND MACROECONOMIC OUTLOOK

Luncheon/Webcast • January 11 2017 • Penn Club

Abstract

The chemical industry enables productivity and progress across all the major manufacturing sectors of the economy as its products are everywhere. The industry has been growing faster than GDP and has been able to outperform the world capital market in terms of total return to shareholders.

The macro picture has also been positive. The world economy has continued to grow in the eighth year of recovery since the financial crisis. Disruptions have been few during this period, as also indicated by typically low readings on volatility indices. Overall growth has been slow but sustained in the developed economies, with a quicker pace in the major emerging economies.

McKinsey's latest economic conditions snapshot reveals a fair amount of executive optimism that conditions will remain the same or improve over the next several months. A closer look reveals some variance at the country and sector levels, with the potential for political conflicts in a number of regions to affect economic outcomes.

Going forward, however, a number of uncertainties could reshape the industry: Will the industry move back to cyclicality? Would other advantaged regions emerge? How would European assets do? When will the Japanese chemicals industry restructure, if ever? Will the Indian growth promise ever materialize? Will digital change the nature of the chemical industry?

Join us to hear an expert view about the outlook for the chemical industry.

Speaker: **G. Sam Samdani, PhD**, is a senior industry knowledge expert at McKinsey & Company, a global management consulting firm. His responsibilities include leading the specialty chemicals service line in the Americas and providing thought leadership across a range of complex knowledge domains within the firm's Chemicals & Agriculture Practice. Prior to joining McKinsey in 1995, Sam worked at McGraw-Hill as an Associate Editor with Chemical Engineering, a monthly technical publication covering developments in chemical and allied process technologies and government regulatory affairs. He received his BS in chemical engineering from Yale University, and his PhD in chemical engineering from the University of Rochester.

ACS Chemistry for Life®

Event Schedule

Location:
Penn Club
30 W 44th Street, NYC

Event Times: (ET)
11:15 am - 12:00 noon
Registration and Networking
12 noon - 1 pm Luncheon
1 pm - 2 pm Talk - Webcast

Luncheon Fees
$120 for non-members
$90 for members
Check for Early-bird savings
Webcast : $30. Free webcast recording for ACS members

Event Host
Charles Brumlik

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LEADERSHIP Awards™
December 5, 2017

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LONG ISLAND SUBSECTION

Board Meeting
Date: Thursday, January 26, 2017
Time: 6:30PM
Place: Nassau Community College
Life Science Building
Chemistry Dept, 2nd Floor

EMPLOYMENT AND PROFESSIONAL RELATIONS COMMITTEE OF THE NEW YORK SECTION

To Human Resources Departments in Industry and Academia

The Employment and Professional Relations Committee maintains a roster of candidates who are ACS members seeking a position in the New York metropolitan area. If you have job openings and would like qualified candidates to contact you, please send a brief job description and educational/ experience background required to **hessytaft@hotmail.com**.

Candidates from our roster who meet the requirements you describe will be asked to contact you.

LONG ISLAND SUBSECTION

FUTURE MEETINGS CALENDAR

* * * * *

Board Meeting Dates
Thursday, February 23, 2017
Thursday, March 30, 2017
Thursday, April 27, 2017
Thursday, May 25, 2017
Time: 6:30PM
Place: Nassau Community College
Life Science Building
Chemistry Dept, 2nd Floor

Spring Seminars
Thursday, Februrary 2, 2017
Time: 5:30PM
Place: Queensborough Community College, S-112
Speaker: Dr. Emily Mundorff
Hofstra University
Title and abstract: TBA

Thursday, March 2, 2017
Speaker: Dr. Joseph Nagyvary
Professor Emeritus
Texas A&M University
Tentative title: Stradivari's secrets
Abstract: TBA

Thursday, April 6, 2017
Speaker: Dr. Fabiola Barrios Landeros
Yeshiva University
Title and abstract: TBA

OTHER EVENTS:
Friday, April 21, 2017
Chemistry Challenge

Saturday, May 6, 2017
Undergraduate Research Symposium

Tuesday, May 9, 2017
High School Awards

NEW YORK NANOSCIENCE DISCUSSION GROUP

2017 Sessions

Hosted by the New York University Department of Chemistry

Speakers and details to be announced.

The NYNDG is an ACS Topical Group that meets in the New York University Department of Chemistry. Sessions feature three 30-minute presentations on nanoscience, one each with strong orientation in biology, chemistry, and physics/applied mathematics. Presentations will be focused on discussion of recent work, although speakers will place the work in a context understandable to a broad audience.

Dates: Tuesdays, February 7 and June 6, 2017
Times: Refreshments at 7:00 PM
Science at 7:30 PM
Place: New York University, Silver Center
31 Washington Place (between Washington Square East and Greene Street)
Room 1003 (10th floor)

For more information, contact: James Canary (**james.canary@nyu.edu**)

Topical Group History: **http://www.nyu.edu/projects/nanoscience**

WESTCHESTER CHEMICAL SOCIETY

FUTURE MEETINGS

****

Special Seminar – "Yes, But Why Sulfuric Acid? - Young William H Nichols Entry into 19th Century Chemical Industry"

Speaker: Peter Corfield, PhD
Department of Chemistry
Fordham University
Bronx, NY

William H Nichols was a remarkable man who had great influence on the young New York chemical industry. He and his friend Charles Waters started manufacturing mineral acids when he was only eighteen. He eventually founded the General Chemical Company, which after many mergers and acquisitions became the Allied Chemical Corporation. He was noted for his entrepreneurial spirit, for bringing scientific principles into manufacturing, and for high ethical standards. As a mature industrial chemist, Nichols funded the gold medal for the New York Section's new annual research award in 1902. This became the first national award of the American Chemical Society, now known as the William H. Nichols Medal Award. The presentation will explore Nichols' contributions in the context of the state of chemical industry in New York during the latter part of the nineteenth century.

Peter Corfield has taught as a full-time Lecturer at the Chemistry Department of Fordham University from August 2011 to the present. He engages also in research with undergraduate students, and has published a dozen papers on old and new work since joining Fordham, making 62 publications in all. Previously, he was Director of the Center for Science and Math Education at Purchase College, SUNY for sixteen years, where he developed the Center's Mission to support excellence in K-16 science and math education, and to offer outreach programs for middle and high school students. He prepared grant proposals and contracts to fund all the programs he managed, with a total of over seven million dollars. Prior to that, he taught at The King's College, NY for twenty one years, as professor of chemistry and chair of the Division of Math and Science.

Date: Thursday, February 9, 2017
Times: Refreshments 5:30 PM
Lecture 6:00 PM
Place: Westchester Community College
Gateway Building, Room 110
75 Grasslands Road
Valhalla, NY

Cost: Free and Open to the Public

Further Information: Paul Dillon
PaulWDillon2@hotmail.com
(914) 393-6940

Note: Inclement Weather: Cancellation Due to Inclement Weather
Should Westchester Community College's Valhalla campus close due to inclement weather (or has delayed opening or closes early) the meeting will be cancelled. Decisions about delay/closure are made around 6:00 AM for day courses and 3:00 PM for evening courses. The college will communicate delays, closings or early dismissals on their website (**www.sunywcc.edu**), Facebook, Twitter, and the (914) 606-6900 phone line.

****

Special Seminar – "From Mixing Molotov Cocktails to Mining Stradivari's Secrets"

Speaker: Joseph Nagyvary, PhD
Professor Emeritus
Texas A&M University

Tentative
Date: Friday, March 3, 2017
See also Dr. Nagyvary article on page 13.

****

Special Seminar – "Cutting and Pasting with DNA: Genome Editing"

Speaker: Evan Merkhofer, PhD
Assistant Professor (Biology)
Mount Saint Mary College

Tentative
Date: Wednesday, April 12, 2017
Times, Place, Cost and Further Information: See under February meeting.

HIGH SCHOOL TEACHERS TOPICAL GROUP

FUTURE MEETINGS:

****

The Feynman Picture of Quantum Confinement of Small Molecules

Speaker: Joseph Gendagorta

and

Computational Chemistry Methods for Crystal Structure Prediction

Speaker: Dr. Leslie Vogt
NYU.

Date: Friday, February 10, 2017
Times: Social and Dinner — 5:45 PM
Meeting — 7:15 PM

Place: Social & Dinner — DoJo Restaurant
14 West 4th St. (@Mercer Street)
New York, NY
Meeting — New York University
Silver Center for Arts and
Sciences, Room 207
Enter from 32 Waverly Place
South-east corner Washington
Sq. East or Washington Place
New York, NY

* * * * *

Preparing an Application for the Math for America Master Teacher Fellowship

Speaker: Lena Douris
<lenadouris@gmail.com>

I will share information about my experience in the MfA Master Teacher program. The details of the application process and the benefits of being involved in the wonderful MfA community. Note: MfA covers the Chemistry program in New York City.

Date: Friday, March 17, 2017
For times and place, see under February meeting, above.

* * * * *

"Demo Derby II"

Date: Friday, April 21, 2017
For times and place, see under February meeting, above.

* * * * *

The Development of Carolacton-derived Macrolactones for the Perturbation of Bacterial Biofilms

Speaker: Dr. Americo J. Fabroni
Department of Chemistry
Temple University
Philadelphia, PA.

Date: Friday, May 19, 2017
For times and place, see under February meeting, above.

JOSEPH NAGYVARY LECTURES

From Mixing Molotov Cocktails to Mining Stradivari's Secrets

Dr. Joseph Nagyvary, Professor Emeritus at Texas A&M University, will give a series of lectures in the New York area **March 2 and 3, 2017**. He recently published his memoir of Hungary that describes the lives of chemistry students during the period of the Cold War, and their participation in the 1956 uprising and fight for freedom. As noted by Dr. Nagyvary "some great chemists, Olah, Somorjai, Pavlath, etc. came out of Hungary in 1956." His presentations will be based on his book, published in October to coincide with the sixtieth anniversary celebrations of the 1956 events and now available at Amazon:

https://www.amazon.com/Violence-Violins-Making-Hungarian-Refugee/dp/1536894060/

For more information on its content, go to **www.violenceandviolins.com** and see the news release from Texas A&M University:

http://today.tamu.edu/2016/10/13/violence-and-violins-prof-recalls-his-role-in-hungarian-revolution/

The presentations will be made at

- St. John's University (Dr. Neil Jespersen, **jespersn@stjohns.edu**)
- Queensboro Community College (Dr. Dominic Hull, **DHull@qcc.cuny.edu**)
- Nassau Community College (contact, information: Dr. Daniel Resch, **Daniel.Resch@ncc.edu**)
- Westchester Community College (Dr. Paul Dillon, **PaulWDillon2@hotmail.com**).

Currently, the schedule is tentative; details will follow in subsequent issues of *The Indicator.*

SPRING 2017 SEMESTER AT NYU

Mark Your Calendars

The Inaugural Edward J. McNelis Lecture in Chemistry

Speaker: John F. Hartwig
University of California/Berkeley

Date: Friday, March 31, 2017
Times: 3:30 PM
Place: New York University, Silver Center
Hemmerdinger Hall, Room 102
31 Washington Place (between Washington Square East and Greene Street)

For more information, contact: James Canary (**james.canary@nyu.edu**)

Thank you to Our MARM 2016 Exhibitors and Sponsors

The Exhibit and Sponsorship Committee of ***the 44th Middle Atlantic Regional Meeting*** (MARM 2016) would like to once again thank our MARM 2016 Exhibitors and Sponsors. Thank you to our Exhibitors for bringing the latest research, laboratory, and education innovations, products or programs, to MARM 2016 attendees. We hope we provided a platform for you to meet face-to-face and build relationship with your potential customers, students or future employees; thank you also to our Sponsors - your generous support has made MARM 2016 experiences extra special for our nearly 1000 meeting attendees. We greatly appreciate your interest in our Regional Meeting of the American Chemical Society and are grateful for your sponsorship.

MARM 2016 EXHIBITORS

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NEW YORK LOCAL SECTION CELEBRATES NATIONAL CHEMISTRY WEEK

Dr. Ping Furlan, Dr. Scott Lefurgy, and Mrs. Erin Wasserman
National Chemistry Week Project Leaders
New York Local Section

On Sunday, October 30, 2016 from 11 a.m. to 4 p.m., for the 12th consecutive year, more than 250 volunteers representing twenty-two area universities, nonprofit organizations, business centers and industries joined in the Local Section's effort and celebrated 2016 National Chemistry Week at the New York Hall of Science, located in Queens. Through forty tables of nearly fifty fun-filled hands-on activities, the program showcased the chemical principles relating to "Solving Mysteries through Chemistry!" and demonstrated the values of chemistry in our everyday lives. This year, the Section once again achieved the highest number of sponsoring organizations and offered the greatest number of tables of activity. Four generous donors included Hall of Science, Maruzen, Pearson, and 4Imprint that provided the program site, safety glasses and financial support. Admission to the Hall of Science was FREE on the event date from 10-11 a.m., allowing the Section to effectively reach and engage over 1,000 museum visitors, especially students in grades K-8, with this highly interactive outreach program.

Theme of forensics was will displayed through all of the different exhibits including "Secret Writing", "Invisible Ink", "Gas Chromatography", "Lifting Prints", "Glowing Blood Tests", "Detective Pen Chromatography", "Fruit DNA Extraction", "Who Is The Candy Culprit?", "Which One Is Water?", "What's In That Drink You Like So Much?", "The Secret Behind 'Fortune Telling'" and "Are These Cups Of Water The Same?". Representing the Section's Board of Directors, Dr. Paris Svoronos, the Section's Past Chair, hosted a table at the event. Dr. Alison Hyslop, the Section Chair, and Dr. Ping Furlan, the NCW Committee Chair, presented "Nickel (Ni)", "Palladium (Pd)" and "Platinum (Pt)" pins to fifteen coordinators of different participating organizations for their Long-term and On-going NCW Leadership and praised all the volunteers for their invaluable contribution to the success of this largest public outreach program of the New York Local Section.

Inside the Hall of Science, NCW balloons and ACS banners were seen everywhere in the hallway and stairs leading to the Viscusi Gallery where the event took place. At the admission table in front of the Gallery entrance, volunteers welcomed the children and other participants with program brochures and ACS giveaways, ensured they had eye protection and answered questions. During the whole day, the activity tables were crowed and swamped with the enthusiastic museum visitors. Children, parents, and the presenters alike obviously enjoyed their time spent together learning about chemistry, experiencing the "magic", color, and marvels chemistry brings to them. Thanks to the volunteers this year who collected a large number of program evaluation forms. The results were extremely positive: 100% agreed that they learned something new or interesting at the event, would like to attend another event in the future, and think that chemistry is awesome or interesting after this event. Many also indicated that they would share what they learned with others after they get home! As the volunteers closed down the program, all were pleased with the day and felt gratified for being part of this terrific program. Many agreed – a year in advance – that they would be back for National Chemistry Week 2017!

This year, in addtion to the Indicator, NY Section and NYSCI Websites, the event flyers were sent to 3,000 school adminstrations in the 5 boroughs, Nassau, Suffolk, Westchester, and Rockland counties with the flyers in both English and Spanish, asking that they be forwarded to science teachers. Additionally, top prizes were awarded to the winners of the 2016 NCW Illustrated Poem Contest in the following three catorgoies: Grades K-2, Grades 3-5, and Grades 6-8.

We would like to extend our warmest thanks to our volunteers as well as the sponsoring colleges, universities, companies and nonprofit organizations. Their enthusiastic support, their strong leadership and community spirit have made the continued success of this largest chemical hands-on public educational event in the area possible.

<u>Long-term and On-going National Chemistry Week Leadership Recognition</u>
Nickel (Ni) Pins
Scott Lefurgy, Emily Mundorff, Anthony Nigro, Paul Sideris, Kenya Velez, Joseph Wiener

Palladium (Pd) Pins
David Deutsch, Jeonghee Kang, Ken Kishida, Mike Melcer, Erin Wasserman

Platinum (Pt) Pins
Zhaohua Dai, Neil Jespersen, Pemela Kerrigan, Erin Thelen

2016 National Chemistry Week New York Section Sponsors New York Hall of Science Maruzen International Co., Ltd Pearson Education 4Imprint

2016 National Chemistry Week New York Section Exhibitors 1. Adelphi University 2. American Institute of Chemical Engineers 3. Barnard College 4. Bronx Community College 5. College of Mount Saint Vincent 6. Columbia Unviersity 7. Cooper Union 8. Hoftstra University 9. Maruzen International Co., Ltd. 10. New York Hall of Science 11. New York University 12. New York ACS Borad of Directors 13. Pace University 14. PepsiCo 15. Queensborough Community College 16. St. Johns University 17. St. Joseph's College 18. Stern College for Women 19. Stony Brook University, Graduate Students 20. Stony Brook University, Undergraduates 21. U.S. Merchant Marine Academy

Coordinators of different participating organizations are honored for their Long-term and On-going NCW Leadership.

(Photo courtesy of Mark Hogan)

The youngsters enjoy the color, fun, and happy surprises chemistry brings to them during the New York Local Scetion's event at the New York Hall of Science.

(Photo courtesy of Dr. Alison Hyslop)

(At left) Winner of the 2016 National Chemistry Week Illustrated Poem Contest.

(At right) The serious "forensic detectives" solving a "crime".

(Photo courtesy of Dr. Alison Hyslop)

Our dedicated volunteers of all ages.

(Photos courtesy of Dr. Alison Hyslop and Dr. Scott Lefurgy)

WESTCHESTER CHEMICAL SOCIETY

On November 10, 2016 Mr. Xiayun Huang spoke on the "Competitive AlphaScreen® Assay for Hyaluronan Detection". Mr. Huang's talk described a new competitive assay for Hyaluronan (Hyaluronic Acid, HA). HA is a linear polymer composed of repeating disaccharides of β-D-glucuronic acid and N-acetyl-β-D-glucosamine. It is the only non-sulfated glycosaminoglycan and is a major component of the extracellular matrix in connective tissues. It has a wide range of molecular weights (up to several million Daltons). Elevated serum HA is a marker for liver impairment (such as liver fibrosis) and inflammatory diseases (such as rheumatoid arthritis). Elevated urine HA is a marker for bladder cancer. Mr. Huang described the development of an HA assay that detects HA with concentrations of about 25 to 3200 ng/mL, essentially independently of the molecular weight (down to 10 monosaccharides) and its distribution. The assay is analogous to a typical immunoassay but, because HA is not immunogenic, a binding protein, Aggrecan, is used to capture HA. Unlike typical ligand capture and immunoassays, this assay is homogenous and does not require a wash step. It uses AlphaScreen® technology. AlphaScreen uses two types of beads (donor and acceptor). The donor beads convert ambient oxygen to singlet oxygen upon illumination at 680 nm. The singlet oxygen can diffuse approximately 200 nm in solution before system-crossing to its ground triplet state. If an acceptor bead is within this distance, energy can be transferred from the singlet oxygen to the acceptor causing emission of a 520-620 nm signal. The two beads are brought into proximity through the HA-Aggrecan interaction. Typically, polymeric analytes are assayed using "sandwich assays" because they are large enough to bind both a capture and a signal ligand. However, the wide range of HA molecular weights complicates this. In a sandwich, the distance between donor and acceptor beads will vary with the molecular weight of the HA molecule tethering them. Higher molecular weights will decrease the probability that the singlet oxygen will diffuse to the acceptor moiety and thus affect the signal. Because of this, a competitive format is used. Donor beads are coated with streptavidin, which is reacted with a terminally mono-biotinylated HA of fixed molecular weight. The acceptor beads are conjugated with Aggregan. Using an HA-free sample, the two beads will become tethered and generate a strong signal. HA in a sample will compete for the Aggrecan with the HA on the donor beads, reducing the number of tethered bead pairs and, thus, reducing the signal. With an optimized test protocol, a linear response was found over the 25-1600 ng/mL range, with little molecular weight effect over the range of 8 to 1000 kDa (20 to 250 disaccharide units). Unfortunately, in human serum, albumin appears to interfere with the test, making pretreatment necessary. Follow-up work on this is planned. There was interesting discussion with the audience during and after Mr. Huang's talk, given at the Westchester Community College in Valhalla, N.Y. Mr. Huang has a B.S. in Pharmaceutical Science from Fudan University, Shanghai, China. He is a PhD student in Materials Chemistry at the Tandon School of Engineering, New York University, working there with Dr. Mary Cowman. After the talk several of the attendees enjoyed a dinner together at a nearby restaurant. The photo below is of Mr. Huang, his mentor, Dr. Mary Cowman, Dr. Ralph Stephani, a member of the Board of Directors of the NY Section, and the WCS board members who attended the meeting.

Ralph Stephani, Paul Dillon, Rolande Hodel, Mary Cowman, Xiayun Huang, Peter Corfield, Joan Laredo-Liddell and Jean Delfiner

(Photo courtesy of Paul Dillon)

ACS Chemistry for Life®

65th ANNUAL UNDERGRADUATE RESEARCH SYMPOSIUM

The Student Activities Committee of the New York Section of the American Chemical Society

Saturday, May 6th, 2017 at Fordham University

8:00 am – 3:00 pm (breakfast, luncheon and award reception included)
Sign up as an attendee at http://www.newyorkacs.org/meetings/urs/urs.php

Keynote Speaker: Dr. Jin Kim Montclare

NYU Tandon School of Engineering

Jin Kim Montclare is an Associate Professor in the Department of Chemical and Biomolecular Engineering (CBE) at NYU Tandon School of Engineering (NYU SoE), who is performing groundbreaking research in engineering proteins to mimic nature and, in some cases, work better than nature. Prior to joining NYU SoE, Jin was an NIH postdoctoral fellow at the California Institute of Technology in the Division of Chemistry and Chemical Engineering in the Tirrell lab. She received a Bachelor of Science in Chemistry from Fordham University as a Goldwater and Clare Boothe Luce undergraduate fellow, a PhD in Bioorganic Chemistry from Yale University as an NSF and Pfizer predoctoral fellow. In 2015 began serving as Graduate Studies Director for CBE and Associate Director for Technology Advancement for the NYU Materials Research Science and Engineering Center, while leading the multidisciplinary Center for Innovation and Entrepreneurship at NYU SoE. Among her many honors and awards are the 2016 ACS WCC Rising Star Award, 2015 Agnes Faye Morgan Research Award from Iota Sigma Pi, 2014 Executive Leadership in Academic Technology and Engineering Fellowship, and 2014 Distinguished Award for Excellence, Dedication to Invention, Innovation and Entrepreneurship.

Keynote Address

Intelligent Self-Assembling Biomaterials

Through centuries of evolution, nature has developed biopolymers capable of folding and assembling into discrete structures with a functional consequence. Inspired by this, our lab focuses on engineering "intelligent" protein materials with entirely new properties and function. In particular, our lab has fabricated protein-derived nanomaterials: helix-elastin block polymers and coiled-coil fibers. We investigate the fundamental self-assembly and molecular recognition capabilities of these systems. More importantly, we are able to harness these structure as well as others to interface with small molecule therapeutics, genes, cells and inorganic metals. Central to this work is the integration of stimuli-responsive domains through rational design.

SIGNIFICANT DATES FOR 63rd URS

Deadline for Abstract Submission - **March 20, 2017** Abstract acceptance notification – April 3, 2017
Deadline for Symposium Advanced Registration – April 21, 2017

2017 Co-chair	2017 Co-chair	2017 Co-chair	2017 Co-chair
Dr. Paul Sideris	**Dr. Ipsita Banerjee**	**Dr. Naphtali O'Connor**	**Dr. Meredith Foley**
Queensborough CC - CUNY	Fordham University	Lehman College - CUNY	New Jersey City University
psideris@qcc.cuny.edu	banerjee@fordham.edu	naphtali.oconnor@lehman.cuny.edu	mfoley@njcu.edu

FREE Registration for student members of the National ACS, faculty mentors who register in advance and sponsors. For non-ACS members and guests, the registration is $35 in advance. All on-site registration is $45 for faculty, staff and guests.Checks for the registration fee should be made out to: "NY ACS URS" and sent to: Prof. Paul Sideris, Queensborough Community College, Department of Chemistry, Science Building S-445, 222-05 56th Avenue, Bayside, NY 11364.

North Jersey Meetings

http://www.njacs.org

NORTH JERSEY EXECUTIVE COMMITTEE MEETING

Section officers, councilors, committee chairs, topical group chairs, and section event organizers meet regularly at the Executive Committee Meeting to discuss topics of importance to running the section and representing the membership. **All ACS members are welcome** to attend this meeting and to become more involved in section activities.

Date: **Monday, January 23, 2017**
Time: 6:00 PM
Place: Web & Teleconference
(See **www.njacs.org** for details)

CAREERS IN TRANSITION MEETINGS

Job Hunting??

Resume & LinkedIn writing and key word search rules are changing. To be found, come and utilize our latest insights. Our ACS trained Career Consultants offer assistance at Students2Science to help members with their job search on the second Monday of each month. Topics at this free workshop are:

- Techniques to enhance resume effectiveness
- Interview practice along with responding to difficult questions
- Networking to find hidden jobs
- Planning a more effective job search

Date: **Monday, January 9, 2017**
New from now on is a second CIT meeting in East Windsor on the third Monday. Contact Bill for details.
Times: Meeting 2:30 - 5:00 PM
Place: Students 2 Science, Inc.
66 Deforest Avenue
East Hanover, NJ

Cost: No charge

Reservations: at **www.njacs.org/careers.html**

A job board and networking assistance is offered at most topical group meetings. Appointments with Bill can be arranged for personal assistance at (908) 875-9069 or **billsuits@earthlink.net**.

See **www.njacs.org** under the Career tab for Jobs hidden from sight and relevant blogs.

NJACS PARTNERS WITH STUDENTS2SCIENCE

Members are encouraged to volunteer at their East Hanover facility and explore their website at **www.students2science.org** to learn more about this innovative program.

S2S continues to expand their exciting laboratory experience the disadvantaged children. Many of our members continue to volunteer as mentors. At their 2 million dollar analytical lab, every 40 kids are assisted by 16 professional volunteer mentors. The experiments performed really make chemistry and science come alive using state of the art analytical equipment working with students starting in 6th grade up to HS seniors. Each day is optimized for grade level and curriculum.

Now the program has further expanded with internet video and experiments performed in the classroom for 4th & 5th grades. Internet allows views of the lab in operation and relates to simpler experiments setups done in the classroom with their teacher and a partnering chemist.

North Jersey members who volunteered benefited in many ways. Those in transition expanded their network and received job finding assistance. Retired chemists met up with old friends and made many new friends. Those with jobs used the volunteer hours as part of the company outreach programs and team training. All feel great about making a difference in the lives of the youth who may have never met a scientist or considered a career in the sciences.

Please consider volunteering and discovering more about this innovative program. If you want to learn more, you can speak with Don Truss at (908) 334-8435

NMR TOPICAL GROUP

Polyethylene Glycol (PEG) Quantitation in Biofluids supporting Drug Discovery

Speaker: Dr. Purnima Khandelwal
Bristol-Myers Squibb, NJ USA

Conjugation of macromolecular drugs to polyethylene glycol (PEG) improves their therapeutic potential by enhancing the half-life. As a substantial component of the drug, it is necessary to measure the pharmacokinetic (PK) characteristics of PEG in vivo. A quantitative NMR-based method was developed and applied to measuring 40 kDa PEG in serum, enabling determination of PK parameters in preclinical species. Observed half-life was found to be consistent with 125Iodine-labeled PEG methods. Moreover, urinary quantitation of 20kDa PEG was used to investigate side effects of a pegylated biologic. NMR spectroscopy was shown to be a convenient and reliable alternative to follow pharmacokinetics of PEG in various biofluids.

Date: **Wednesday, January 18, 2017**
Times: Dinner 6:00 PM
Seminar 7:00 PM
Place: Dinner —Frick Chemistry Atrium
Seminar — Frick Chemistry
Room A81
Princeton University
Cost: Dinner — $15 employed /
$5 students, postdoc, retired, unemployed.
No charge for seminar only.

Directions: **http://m.princeton.edu/map/campus?feed=91eda3cbe8&group=princeton&featureindex=0649&category=91eda3cbe8%3AALL&_b=%5B%7B%22t%22%3A%22Map%22%2C%22lt%22%3A%22Map%22%2C%22p%22%3A%22index%22%2C%22a%22%3A%22%22%7D%5D**

Parking: Parking will be available in Lot21 (see map link given above under Directions)

Public Transit: It is possible to take NJ Transit all the way to Princeton campus (the symposium location is ~ 10 min walk from the train station). Take the Northeast Corridor NJ transit train to Princeton Junction, then transfer to the small "dinky" train that ends on campus (5 min train ride).

Registration: **http://www.njacs.org/nmr-spectroscopy-topical-group**

Questions:
Anuji Abraham **Anuji.Abraham@bms.com**
Mary Harner **Mary.Harner@bms.com**

Call for Nominations

COMMITTEE ON THE HISTORY OF THE NEW YORK SECTION

Over the past twenty-three years the New York Section has participated in the designation of seven National Historic Chemical Landmarks and four New York Section Historic Chemical Landmarks. A brief description of these National and local section landmarks may be found on the NY Section Home Page at **newyorkacs.org**, under the Committee on the History of the NY Section. These landmark programs recognize achievements in the chemical sciences and related areas, in order to enhance public appreciation for the contributions of the chemical sciences to modern life.

Please consider making a nomination for an historic chemical landmark. The Committee on the History of the NY Section will consider all nominations. In addition to a particular achievement, an historic library, building or association may be worthy of this distinction.

Please send your nomination, with supporting documentation, to the Chair of the Committee, Dr. John B. Sharkey, at **johnbsharkey@me.com**.

WESTCHESTER CHEMICAL SOCIETY DISTINGUISHED SCIENTIST AWARD 2017

The Westchester Chemical Society is accepting nominations for the "WCS Distinguished Scientist Award 2017". Scientists who live or work in Westchester or the Bronx qualify. The awardee is expected to attend the Awards Dinner (April/May timeframe) and to present aspects of his or her work. Self-nominations are acceptable. Nominations are not carried over from previous years. New and possibly updated nominations should be submitted. Please send a cover letter stating why your nominee should receive the award along with the nominee's resume **by January 31, 2017** to:

Dr. Paul Dillon at
PaulWDillon2@hotmail.com or
67 Matthes Road, Briarcliff Manor, NY 10510

or to: Dr. Peter Corfield at
pwrc@earthlink.com.

THE SOCIETY FOR APPLIED SPECTROSCOPY — NEW YORK SECTION

2017 Gold Medal Award

Nominations are being sought for the 2017 Gold Medal Award of the New York Section of the Society for Applied Spectroscopy. This coveted award was established in 1952 to recognize outstanding contributions to the field of Applied Spectroscopy. The Gold Medal will be presented at a special award symposium, arranged in honor of the awardee, at the 2017 Eastern Analytical Symposium. A nominating letter describing the nominee's specific accomplishments should be submitted along with a biographical sketch and list of publications by January 10th, 2017. Please email all materials to Kathryn.lee@rap-iD.com or mail to Kathryn Lee, Rap-ID Inc., 11 Deer Park Drive, Suite 201, Monmouth Junction, NJ 08852.

This announcement and contact information is also available on our website **www.nysas.org**

If you have any questions or require more information, you may contact Kathryn Lee at (732) 823-1567.

Call for Applications

WILLIAM H. NICHOLS FELLOWSHIP

The New York Local Section of the American Chemical Society is proud to announce the continuation of a summer research opportunity for undergraduates, the William H. Nichols Fellowship. The Nichols Fellowship is open to all college students majoring in chemistry (broadly defined) who will perform research over the summer before graduation at an institution in the NY Local Section geographic area. Each Nichols Fellow receives a stipend of $5,000 to support them as they perform their research, and is expected to submit a two-page written report at the end of the summer and present their work at the 2018 Undergraduate Research Symposium. In addition, each Nichols Fellow and their mentor will be invited as honored guests to the 2018 William H. Nichols Award Banquet.

Applications are available online at **www.newyorkacs.org/NicholsFellowship.php** and are **due December 15, 2016**. All applicants will be notified **by March 1, 2017**.

FREDDIE AND ADA BROWN AWARD

This Award recognizes and encourages high achieving middle- and high-school students, of African American and Native American heritage, to further develop their academic skills, with views on careers in the chemical sciences

Award Amounts

Middle School $100.00 Check and $50.00 gift certificate : High School $200.00 Check and $100.00 gift certificate

Who is Eligible

Middle School students enrolled in a science class : High School students who have completed a chemistry course

Grades

Middle School B Average or better in Science, B Average overall : High School B Average in Chemistry, B Average overall

Letter of Recommendation

Math or Science/Chemistry Teachers or Guidance Counselor

Statement

Middle School "Why I Like Science" : High School "Why I Like Chemistry"

Selection Criteria

Applicants must be African American (Black) or Native American (including Pacific Islander) or of mixed race.

Transcript

Official transcript required.

Financial Need

Not Required.

Applications available on the web: **www.njacs.org/freddieadabrown** or from your school guidance office.

Return Application To

Freddie and Ada Brown Award, NJACS Section Office, 49 Pippens Way, Morristown, NJ 07960

Due Date

Completed Applications must be postmarked no later than **March 31 Annually**

Questions: Contact Jeannette Brown **Jebrown@infionline.net** or (908) 239-1515

Call for Volunteers

OPPORTUNITY FOR ACS MEMBERS TO AID STUDENTS 2 SCIENCE IN A HYBRID VIRTUAL LAB PROGRAM

Can you spare a few hours of your time? Do you like working with students and would you like the opportunity to share your science knowledge in a classroom? Students 2 Science is seeking volunteers to aid in our Virtual Lab program. We have a series of elementary, middle, and high school experiments that we will be running in various schools across New Jersey. Members are especially needed to help with the North Jersey section's IPG funded project to bring hands-on science to South Jersey. We need professionals to help in the classroom with the students. It's great fun, a wonderful way to give back, and only requires a few hours of your time. Opportunities begin in November. For more information, contact Fran Nelson, **frannelson@students2science.org** and visit our website at **Students2Science.org**

THIS MONTH IN CHEMICAL HISTORY

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

I have got into the habit of starting off the New Year's columns with looking back one hundred years. I am not going to change my (relatively) recent ways and so this column, and perhaps a couple of succeeding columns, will be drawn from Volume XIV of the Annual Reports on the Progress of Chemistry for 1917 issued by The Chemical Society of London (now The Royal Society of Chemistry). This is a rather slim volume. "The continuance of war conditions has led to a further diminution of published research…" In 1917 the U.S. entered the war against Germany and its allies and much of the research carried out by both sides during the conflict was war-related and not published at the time. Still there is enough research of interest to provide material for a few columns.

Isotope separation (the coinage of the term isotope by Soddy dates back only a few years from 1917) was a topic of continuing interest. Lead nitrate derived from carnotite, a uranium vanadate mineral containing small amounts of lead from the radioactive decay of uranium, "was subjected to fractional crystallization more than a thousand times. [!] A determination of the atomic weight of the metal in the least and most soluble fractions gave numbers agreeing within 0.006 per cent., which is well within the limits of the possible experimental error." "Isotopes cannot be separated by crystallization processes."

The work of W.D. Harkins on the evolution of the elements is directed towards understanding the basis of the periodic table. Harkins postulated that all elements derive initially from hydrogen via helium nuclei thus giving rise to two distinct series of elements: " those beginning with helium and containing elements of even atomic number, the other beginning with lithium and containing elements of odd atomic number." He observed that even-numbered elements are present in the crust of the earth, or meteorites, in greater abundance than those of odd number. This perhaps reflects the relative stabilities of their nuclei.

The work of the Braggs, father and son, on X-ray diffraction by crystals of the alkali metal halides is controversial. Their results "appear to be incompatible with the ordinary molecular hypothesis as applied to solid substances." To clarify, the Braggs showed that there are no NaCl molecules in a salt crystal. This was an unpalatable view to many chemists at the time; it is only in hindsight that we can see that the work of the Braggs is entirely consistent with the ionization hypothesis put forward by Arrhenius thirty years earlier. The study of crystal structure was still in its infancy in 1917, and many subsequent studies showed the correctness of the view advanced by the Braggs. Langmuir suggested an interpretation that more accords with our present view; he advanced the idea that the entire crystal represents a single molecule. (Langmuir became one of the most ardent supporters of the views of G. N. Lewis on ionic and covalent bonds, and the octet rule.)

In an important addition to the techniques of X-ray diffraction of crystals Debye and Scherrer have shown that a powder method can be used to determine structures of materials for which the crystallographic system (required by the Bragg method) is not known. They investigated graphite and so-called "amorphous" carbon and showed that the latter is identical structurally to graphite, the difference being solely in the state of subdivision of the graphite crystals. Thus "there are but two structurally different modifications of carbon, namely, diamond and graphite". The Debye-Scherrer method is still widely used in X-ray studies of powders.

To inorganic chemistry: in Group II element #4 is still being called glucinum. (Apparently some beryllium compounds have a sweet taste; hence the name glucinum. I warn my readers not to check this by personal experiment. Beryllium compounds are toxic!) The melting point of glucinum has been estimated to be 1278o. The element was prepared by electrolysis of sodium glucinum fluoride and was estimated to be 99.5% pure, the main impurity being glucinum carbide.

There is more to be written about chemistry in 1917. Watch this space.

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