THE Indicator

DECEMBER 2008 Vol. 89 • No. 10 ISSN0019-6924

Dr. Barbara R. Hillery

2009 New York Section Chair

NoJ "Member Spotlight" Article on Dr. Joel Barrish, pg. 15.

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THE INDICATOR
Manager / Editor
LINDA ATKINS
PO Box 3301, Spring Hill, FL 34611-3301
973-981-4383; Fax 352-200-5195
e-mail: linatkins@tampabay.rr.com
Advertising Manager
VINCENT GALE
MBO Services
PO Box 1150, Marshfield, MA 02050-1150
781-837-0424
e-mail: vincegale@mboservices.net
INDICATOR COMMITTEE
New York Section Rep.
DR. NEIL JESPERSEN
Chemistry Dept., St. John's University
8000 Utopia Parkway, Jamaica, NY 11439
718-990-5221, e-mail: jespersen@stjohns.edu
North Jersey Section Rep.
DR. ANITA BRANDOLINI
TAS, Ramapo College, 505 Ramapo Valley Rd., Mahwah, NJ 07430 • 201-684-7753
e-mail: abrandol@ramapo.edu
Web Master
PAUL TUKEY — e-mail: tukey@verizon.net
NEW YORK SECTION
http://newyorkacs.org
Chair
DR. MARC WALTERS
Dept. of Chemistry, New York University
100 Washington Square East, New York, NY 10002
212-998-8400; Fax 212-260-7905
e-mail: marc.walters@nyu.edu
Chair-Elect
DR. BARBARA R. HILLERY
Dept. of Chemistry, Old Westbury College - SUNY
P.O. Box 210, Old Westbury, NY 11568
516-876-2738; Fax 516-876-2704
e-mail: hilleryb@oldwestbury.edu
Secretary
DR. IWAO TERAOKA
Dept. of Chemical and Biological Sciences
Polytechnic Univ., 333 Jay St., Brooklyn, NY 11201
718-260-3466; Fax 718-260-3676
e-mail: teraoka@duke.poly.edu
Section Office
St. John's University, Chemistry Dept.
8000 Utopia Parkway, Jamaica, NY 11439
516-883-7510; Fax 516-883-4003
e-mail: njesper1@optonline.net
NORTH JERSEY SECTION
http://www.njacs.org
Chair
DR. MICHAEL M. MILLER
Drug Discovery Chemistry, Bristol-Myers Squibb Co.
Pharmaceutical Research Inst., P.O. Box 5400,
Princeton, NJ 08543-5400
e-mail: michael.miller@bms.com
Chair-Elect
DR. JOSEPH POTENZA
Dept. of Chemistry and Chemical Biology
Rutgers University
610 Taylor Road, Piscataway, NJ 08854
732-445-2115, Fax 732-445-5312
e-mail: jpotenza@rutchem.rutgers.edu
Secretary
BETTYANN HOWSON
49 Hillside Avenue, Madison, NJ 07940-2612
973-822-2575
e-mail: chemphun@optonline.net
Section Office
4 Cameron Road, Piscataway, NJ 08854
732-463-7271

THE **Indicator**

CIRCULATION: 7,500

The monthly newsletter of the New York & North Jersey Sections of the American Chemical Society. Published jointly by the two sections.

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The Indicator (ISSN0019-6924) is published monthly except July and August by the New York and North Jersey Sections of the American Chemical Society, Office of Publication 10500 Horizon Drive, Spring Hill, FL 34608-5761. **Periodicals Postage Paid at Spring Hill, Florida and at additional mailing offices.**

POSTMASTER: **Send address changes to American Chemical Society, Department of Member and Subscriber Services, *THE INDICATOR*, P.O. Box 3337, Columbus, OH 43210, or e-mail: service@acs.org.**

All views expressed are those of the editor and contributors and do not necessarily represent the official position of the New York and North Jersey Sections of the American Chemical Society unless so stated. **Subscription price included in dues paid by New York and North Jersey Section members. Subscription price to non-members of either Section $20.00 per year. To subscribe, make checks payable to *The Indicator* and mail to the Manager/Editor (see top of left column on this page.**

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The Indicator **is posted to the web on the 15th of the previous month at www.TheIndicator.org**

Deadline for items to be included in the February 2009 issue of *The Indicator* is December 15, 2008.

CHEMICAL HISTORY

Harold Goldwhite, California State University, Los Angeles

Although most of the chemists I discuss in this column had formal training in science at least to University level, there are a few interesting figures in the history of chemistry who made a major impact on the science without any advanced training at all. The subject of this month's column is one of those self-taught giants of industrial chemistry: Edward Goodrich Acheson, who was born in Washington, Pennsylvania, on March 9, 1856.

Acheson did attend school in Pennsylvania until his mid-teens, but in science he picked up his knowledge by reading and by experimenting. He was an inventive genius; he submitted his first patent application, concerning a new type of drill to be used in coal mining, to the Patent Office when he was sixteen. Acheson's father died when the boy was seventeen, and he became the main support of his mother and his sisters. Pennsylvania was already a center for the mining of coal and iron ore, and the new petroleum industry was also developing in the State. Acheson worked in these industries during the day, but in the evenings studied and experimented in science, and was particularly fascinated by electricity. He developed a new type of battery, and sent his idea to the great figure in electrical technology of the time, Thomas Edison. Edison liked what he saw, and hired Acheson as a member of his famous group at Menlo Park, New Jersey. Edison's laboratory at Menlo Park was the first industrially oriented research and development laboratory in the United States.

Acheson's initial appointment was as a draughtsman, and it seems that Edison did not encourage Acheson to develop his original ideas. He stayed with Edison, on and off, for the next four years, and at least got a taste for foreign travel out of his experience. He helped install the new Edison electric lighting systems in a restaurant in Amsterdam, a museum in Brussels, and the famed opera house, La Scala, in Milan. But he was frustrated by not being able to develop his own lines of work in electrochemistry, and in 1884 left Edison to go it alone. He made his first breakthrough two years later, when a patent was granted him for a new kind of low-loss electric cable. He sold the patent for a healthy sum to George Westinghouse.

In 1891 Acheson made the kind of serendipitous discovery that we are told only favors prepared minds. He had developed a new high current electric furnace, capable of reaching very high temperatures. He subjected several clay samples to the extreme conditions of the furnace, and them tried a mixture of pure silica sand and coke. The product was silicon carbide, which Acheson dubbed carborundum. He rapidly recognized the great potential of his new material as an abrasive and polishing material. He immediately set up the Carborundum Company to manufacture and market the new product, initially in grinding wheels. Carborundum was an instant success, made Acheson wealthy, and has been a mainstay of the abrasives industry ever since.

Although graphite has been used in pencils since the sixteenth century, the supplies of the natural mineral were not abundant until new sources were found in India in the nineteenth century. Despite the new supplies graphite was still a fairly costly material in 1890. Acheson used his new furnaces to attempt to make synthetic graphite from coke or anthracite, and in 1895 he succeeded. As was his practice he set up a new company, the Acheson Graphite Company, to exploit the new discovery. His graphite was used for pencil leads, for crucibles for processing high purity metals, and for the hearths of blast furnaces. A few years later Acheson devised a stable emulsion of graphite in water, which became a valuable industrial lubricant. Acheson graphite was also a critical ingredient in fabricating electrodes for the fast growing electrochemical industry. These electrodes were used in chlorine cells, and in the reduction of phosphate rock to white phosphorus.

Acheson, self-taught genius of electrochemistry, received his first degree in 1909, an honorary D.Sc. from the University of Pittsburgh. Other honors were bestowed on him too: the Rumford Medal in 1908, and the Perkin Research Medal in 1910. He was elected President of the Electrochemical Society and, fittingly, was the first recipient of the Acheson Prize and Medal of that Society in 1930. Edward Acheson died in New York City on July 6, 1931.

DECEMBER HISTORICAL EVENTS IN CHEMISTRY

by Leopold May, The Catholic University of America, Washington, DC

December 2, 1942
First atomic pile produced first self-sustained nuclear chain reaction under Stagg Field, University of Chicago.

December 3, 1933
Seventy-five years ago, Paul Crutzen, who is a researcher in chemistry of the atmosphere, was born. In 1996, he shared the Nobel Prize in Chemistry with Mario Molina and F. Sherwood Rowland for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone.

December 4, 1908
One hundred years ago Alfred D. Hershey was born on this date. In 1969, he shared the Nobel Prize in Physiology or Medicine with Max Delbrück and Salvador E. L. Kuria for their discoveries concerning the replication mechanism and the genetic structure of viruses

December 6, 1835
One hundred and twenty-five years ago, Rudolf Fittig synthesized coumarone in 1883. He also synthesized lactones, with B. C. G. Tollens; toluene; and discovered diphenyl and phenanthrene in1872. He was born on this date.

December 9, 1868
Fritz Haber, who was born on this date, synthesized ammonia from hydrogen & nitrogen under high pressures (Haber Process). In 1918, he received the Nobel Prize for the synthesis of ammonia from its elements.

December 12, 1775
William Henry, who was born on this day, discovered that the amount of gas absorbed by a liquid is proportional to the gas pressure.

December 14, 1909
Fifty years ago, Edward L. Tatum shared the Nobel Prize in Physiology or Medicine with George W. Beadle for their discovery that genes act by regulating definite chemical events and Joshua Lederberg for his discoveries concerning genetic recombination and the organization of the genetic material of bacteria and discovered genes that regulate certain chemical processes. He was born on this date.

December 17, 1908
One hundred years ago, Willard F. Libby was born. He developed carbon dating and received the Nobel Prize in Chemistry in1960, for his method to use carbon 14 for age determination in archaeology, geology, geophysics, and other branches of science.

December 17, 1778
Two hundred years ago, Humphry Davy discovered barium and strontium and in 1807, potassium and sodium. He born on this date and invented the Davy mine safety lamp.

December 18, 1890
Mary L. Caldwell, who isolated enzymes for individual analyses, was born on this date.

December 23, 1912
Twenty-five years ago, Anna J. Harrison served as president of the American Association for the Advancement of Science. She was the first woman to be the president of the ACS in 1978 and was born on this date.

December 29, 1879
Ellen Gledirsch, who was born on this date, made accurate measurements of the half-life of radium.

Additional historical events can be found at Dr. May's website, at **http://faculty.cua.edu/may/ChemistryCalendar.htm** or the "This Week in Chemical History" at the ACS website: **http://www.acs.org/whatischemistry**.

CHEMISTRY SAVES CHRISTMAS, ENHANCES HANUKKAH, AND LIGHTS UP THE SOLSTICE OR, EXPLORING THE SCIENCE BEHIND THE LIGHTS AND THE TINSEL

By Kevin K. Olsen, Montclair State University, **Olsenk@Mail.Montclair.edu**

Before delving into the science behind Holiday decorations, it might be well to briefly review some of the history behind the traditions. As Christianity spread through Eurasia, the indigenous religious symbols were incorporated into nativity celebrations. Wreaths, garlands, mistletoe, holly, laurels, and evergreen trees symbolized everlasting life and were important elements of the pre-Christian winter solstice celebrations. In time these became part of the Christian tradition.

The Christmas Tree was an ancient German tradition which became part of the Christian celebrations. By 1755 they were becoming popular in other parts of Europe. The earliest tree decorations consisted of fruits, candies, gilded nuts, marzipan cakes, strings of glass beads, dolls, and other small toys.

Except among German immigrants, there were no Christmas trees in colonial America. Evergreen boughs, garlands, wreaths and ropes made of intertwined spruce branches were brought indoors for decoration. Colorful fruits such as bright red apples, winter berries, and dried herbs were incorporated into the decorations to provide splashes of color among the greenery.

The Christmas tree did not become hugely popular outside of the German-speaking world until 1841. Prince Albert, Queen Victoria's German born husband, set up a Christmas tree for their children. The tree was decorated with candles, gingerbread, candies and fruits. When the popular magazines printed pictures of the tree, it created a widespread demand for Christmas trees on both sides of the Atlantic.

In colonial and early New Jersey there were a great number of different ethnic groups each of whom had their own Holiday traditions. The English brought the tradition of the Wassail to the New World. The traditional Wassail punch was a mixture of wine, ginger, cinnamon, cloves, allspice, and nutmeg but poorer families substituted ale and a mix of less expensive spices. Among the ethnic Dutch, the Feast of Saint Nicolas on December 6th was the traditional time for feasting, gift-giving, and merriment. (After gaining independence from Spain in 1581, the Protestant Dutch tried to eliminate this Catholic feast but backed down after facing rebellious young children.) It is widely believed that Philadelphia's Mummers' Parade originally arose from the traditional Santa Lucia celebrations brought to the New World by the region's Swedish settlers.

In many parts of the western world, glass ornaments began to replace edible decorations on trees in the mid-1800s. For most of the latter half of the 1800s, the majority of Christmas ornaments were imported from Germany where producing them was a cottage industry. The craft was also practiced in Poland and Czecho-Slovakia.

In a family workshop the father traditionally formed the desired shape from glass tubing. While balls and bells were the most common shapes, molds made of plaster or metal allowed shapes like hunting horns, pipes, and birds to be produced. The children usually had the task of pouring a silver nitrate mirroring solution into the ornament. It was allowed it to dry overnight and then dipped into highly colored lacquer. The lacquer coat was kept thin so that the silvering showed through and imparted a luster. After again being allowed to dry, it was trimmed with bits of ribbon or lace.

The United States imported not just its Christmas ornaments but most of its laboratory glassware from Germany. The city of Jena in central Germany on the river Saale was the main center of labware production. With the outbreak of the First World War this source was cut off. American

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glass producers were forced to learn specialized production techniques for first time.

After the war, it would appear that the production of both toys and Christmas ornaments recovered fairly quickly. In 1912, Germany produced 524,680,000 ornaments and toys. In the first half of 1921, 374,668,000 ornaments and toys were manufactured.

The Second World War again interrupted the supply of specialty glasses not just ornaments. The American war effort demanded precision optical glass for binoculars, cameras, bomb-sights, and periscopes as well as laboratory glass for the expanding defense industries. Corning Glass took the lead in developing replacements and soon was able to supply borosilicate and other specialty glasses. After the war, Corning's expanded production capabilities and increased technical know-how allowed the company to become the first large volume manufacturer of holiday ornaments in the United States.

Today the typical glass Christmas ball begins as a ribbon of uncolored molten glass. As the ribbon passes over a mold, a stream of compressed air forces the glass into a mold. As with the earlier hand crafted ornaments, a silvering solution is applied to the interior of the ball and a coat of lacquer to the exterior.

Shiny reflective surfaces have always been part of the holiday traditions. In the special Christmas markets set up in European cities, it was possible to buy thin sheets of gold for gilding almonds and other types of nuts. In the English-speaking world, the first mention of tinsel as a decoration occurs in the early 1500s. At that time the word referred to gold or silver threads woven into cloth, a brocade or such threads, or a thin coating or gold or silver overlaying fabric.

By the late 1700s tinsel came to also refer to any type of thin metallic plates cut into strips and used for decorating. Less expensive metals such as copper, brass, lead, and tin were available in addition to the more costly silver and gold. It was also about this time that the word "tinsel" came to have connotations of cheapness, gaudiness, or superficiality. In 1782 John Knox wrote, "The character of a man of integrity and benevolence is far more desirable than that of a man of pleasure or of fashion. The one is like solid gold, the other like tinsel."

The astute reader (and most readers of the Indicator are astute) will have noticed that the word "tinsel" was applied to a type of shiny decoration several hundred years before "tin" was actually used in the manufacture of "tinsel." The Oxford English Dictionary offers no explanation. The English word "tin" dates to the 1200s and "tinsel" to the 1300s. This would seem a logical progression except that the original definition of "tinsel" was a loss or setback. Perhaps in this instance "tinsel" referred to the loss of shine as tin metal oxidized?.

Whatever the origin of the term, thin strips of metal and the open flames of holiday lights were not a safe combination. On December 26th, 1900, Timothy Bahnsen of New York was visiting his brother in Saint Louis. When the tinsel on the tree caught fire, Bahnsen suffered what appears to have been an heart attack and was dead within minutes.

Lead foil strips were less prone to catch fire but did present a risk from poisoning. Another approach tried in an effort to reduce the fire risk, was to create tinsel consisting of thin layers of aluminum on a cellulose acetate substrate. While theoretically less flammable than aluminum powder, this material could be ignited with a match or even catch fire from the radiant heat of a fireplace.

Metallic pigments on fire-proof organic films and metallic coatings on paper were tried but were not price competitive with lead foil.

Then in 1969 a new method of creating tinsel from multiple layers of thin film was developed. Individual layers of iridescent films consisted of a flame-proof thermoplastic resin between 0.05 and 1.0 microns thick. Layers of a transparent polymer were placed between these so that in the final product only about 20% of the material used was actually iridescent. For maximum shine it was found that the refractive index of each layer should vary about 0.03 from that of the next closest.

For the maximum shine and reflectance, it would be hard to beat a Christmas tree made entirely of aluminum. The most popular aluminum Christmas trees were sold under the Evergleam name between 1959 and the early 1970s.

In December of 1958 a sales manager for the Aluminum Specialty Company of Manitowoc, Wisconsin, first noticed a metal Christmas tree displayed in a Chicago department store. The tree was made by Modern Coatings, Inc. of Chicago. But it was too expensive and bulky for wide distribution. In only three months time, Aluminum Specialty's engineering department had their own metal tree ready in time for the March 1959 American Toy Fair. Although it was an huge gamble, Aluminum Specialty went on to produce several hundred thousands of trees in time for the 1959 holiday season. The buyer for the Ben Franklin Department Stores, Tom Gannon, deserves much of the credit for the tree's success as he took the risk of buying the trees before anyone knew if they would prove to be popular. They were popular, sales took off and more than one million Evergleams were sold during the 1960s.

By the middle of the 1960s Aluminum Specialty was manufacturing trees year round. Although about 75-80% of all Evergleams were silver, the company also made trees in other colors. Trees came in a variety of sizes from two to eight feet high.

Developing the Evergleam tree required some sophisticated metallurgy. According to Richard Thomsen, one of the engineers who developed the tree, pieces of aluminum had to be formed in such a way as to create a branch that was approximately 3.5 inches wide but that would also compress small enough to package in a 1-inch diameter paper tube. When the tree was disassembled for storage the branches had to be removed from the trunk and packed back into the tubes. An entire eight foot high tree with 120 removable branches weighed no more than ten pounds and could be stored in a small box. The branches are so resilient that when removed from their storage tubes, they still pop out to full size even after 50 years.

Thomson describes the tree as having, "lots of pizzaz, with a light, and a revolving stand."

Of all holiday symbols lights are the most ancient. Most religious traditions in the northern hemisphere mark the solstice in some way. During the time that Christianity was a minority religion within the Roman Empire, Church leaders decided that the solstice was an appropriate time to commemorate the Nativity. The Empire's state religion observed the Saturnalia, a time of feasting and gaiety, at the solstice. This decision provided protective coloration to the early Christian communities during their own celebrations.

Hanukah, the festival of lights, is also linked to the solstice though this occurred in a somewhat more convoluted process.

Antiochus, the king of Syria, conquered Judea in 170 BC. He forbade worship in the Temple and stole the menorah, or sacred lamp, from the altar. At the solstice, the Syrians rededicated the Temple to a Pagan deity. Rebels lead by Judah the Maccabee retook Jerusalem. They restored the temple and lit the menorah exactly three years after the flame had been extinguished.

When the Rebels searched the temple storerooms for sacred oil to burn in the Menorah there was only enough for one day. But the flames miraculously lasted for eight. The celebration of Hanukah commemorates the rededication of the temple and the miracle of the lamps.

Before electric lights became available, candles were attached directly to the branches of Christmas Trees. To guard against fire, the candles were usually lit for only a short time on either Christmas Eve or Christmas Day. At first candles were held to the branches with bits of wire but in 1867 Charles Kirchhoff of Newark, New Jersey, patented a counter weighted candle-holder that had a balance weight suspended below the branch. About a decade later,

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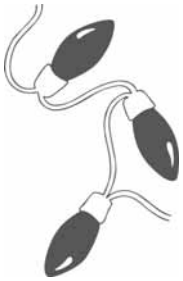
a much lighter spring-loaded clip candle-holder was patented by Frederick Arzt of New York.

Lamps consisting of a colored glass globe provided an alternative to candles in the late 1800s. The glass globe was hung from the tree branch by a loop of wire. At the bottom was a small pool of water with a layer of oil floating on top. A small wick sat in the oil. They were somewhat safer than candles since the flame was contained entirely within the globe. Some of these lamps were quite elaborate with fanciful shapes and bright colors. Lamps featuring Queen Victoria's coat of arms are especially prized by ornament collectors. At the low end of the market, walnut or other types of nut-shells were sometimes filled with oil and a fitted with floating wick.



Thomas Edison created the first outdoor Holiday Light Spectacular at his Menlo Park, New Jersey laboratory in 1880. The light display was placed where it could be seen from the Pennsylvania Railroad. The display featured a square half-mile of open fields filled with "row upon row" of plain white post, each topped with an incandescent lamp and a glass globe. It took 11 dynamos to power the display. Five miles of wire were required to connect all of the lights.

Edison's light show was intended primarily to promote his plan to electrify downtown Manhattan. The display was after all in full view of the New York to Philadelphia main line. According to press reports at the time Edison "sensed that identifying his lights with the holiday might further suggest that a wondrous new age was about to unfold."

The first indoor Christmas tree to have electric lights was in the Manhattan home of Edward H. Johnson, a friend and longtime business associate of Edison's. The tree was installed in 1882 and had red, white, and blue electric lights. It was described as "presenting a most picturesque and uncanny aspect," with "eighty lights in all encased in these dainty glass eggs ... all the lights going out and being relit."

The tree was mounted on a revolving base. Contacts built into the base opened and closed as the tree revolved. Ironically, the tree was turned by a small steam engine in the cellar of the house.

The next year the first electrically powered menorah was installed in the home of another of Edison's associates.

General Electric bought the rights to manufacture holiday lights in 1890 but they made only the bulbs and the sockets. A "wireman" was required to come into the home and connect the bulbs together. He then connected the string to the mains and after the holiday, the whole process had to be reversed. In 1903 the Ever Ready Company brought out the first strings of 28 connected bulbs. Machine-blown bulbs were introduced in 1919.

In 1921 Underwriters' Laboratory published the first safety standards for holiday lights. Early light sets were wired in series so the loss of one bulb meant that the entire set went dark. General Electric introduced the first holiday lights to be wired in parallel in 1927.

The typical modern holiday light uses about 600 milliamps of electricity. In what may seem a step backwards, they are wired in series. An electrical shunt incorporated into the bulb holder is used to maintain continuity should an individual bulb burn out. During the 1990s high tech titanium and tungsten filaments were developed that made bulbs twice as bright as anything previously produced.

So this Holiday Season, dear reader, raise a beaker in toast the generations of craftsmen, inventors, and chemists who have brought light and sparkle to the darkest days of the year.

NEW YORK SECTION CHAIR'S MESSAGE, 2009

The New York Section is a distinguished and prestigious Section, possessing a rich heritage and an impressive roster of members. Many of its members have won national and international distinctions, and the New York Section itself is an award winner from the national ACS. I am honored to have been elected to serve as its Chair for 2009. Being Chair means the nitty-gritty of section business is my responsibility; being Chair means I work to ensure that the NY section continues its national prominence; being Chair means I work for you.

Chemistry is frequently referred to as the central science, inherently cross-disciplinary and touching all parts of our lives. Therefore we must continually reach out to other organizations, share expertise, and collaborate on events. Our organization must appeal to and respond to the needs of academia, industry, and government. As chemists, we must be concerned with and involved in all those areas that affect our profession. And this means we must be more engaged in outreach of all types.

In the past year the NY Section has focused on affecting public policy through reinvigoration of the Governmental Affairs Committee, but we must not stop there. We need to serve as the voice of chemistry for our public officials, but we also need to bring that voice to the public at large. If the general public does not understand the science behind a public policy issue, then we have not done our job. Grass roots advocacy must not be neglected. If activists can do it, so can we. As scientists, we must be willing to speak out; we must do our part to ensure public understanding. We must acknowledge that being a dedicated scientist does not prevent one from being a concerned and involved citizen, from having an opinion. Rather, the knowledge and training informing that opinion obligates us to participate in the public debate.

So as we start the new year, consider the following questions:

- Have you registered for the ACS Legislative Action Network?
- Have you reached out to the community, aiding understanding of the complex scientific issues affecting the electorate?
- And finally, have you reached out to the NY Section, to attend an event, to inform the direction of the Executive Board, or simply to report on your own chemistry outreach activities?

The NY Section is yours and its success depends on you. I'll handle the organizational details. I look forward to working with the entire NY Section membership during the coming year, and I am committed to continuing to increase the public awareness and understanding of chemistry.

Barbara Hillery, Ph.D.
2009 Chair ACS – New York Section

Education

New York Meetings

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CHEMICAL MARKETING & ECONOMICS GROUP

2008 - 3RD ANNUAL ENERGY & RESOURCE CONFERENCE

"Water: The Next 'Oil' "

Co-Founding Sponsors: AIChE, Metro NY Section and the Chemical Marketing & Economics Group of NY-ACS

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PDHs to be offered to NYS Professional Engineers

Download Updated Conference Flyer: **http://homepage.mac.com/daviddee/page0/files/2008** Water Conf Oct08.pdf

Date: **Thursday, December 4, 2008**
Times: 8:30 AM - 5:00 PM
Place: The Con Edison Building
4 Irving Place (14th-15th Streets)
New York, NY
Cost: Members $100 (AIChE, local section or CM&E members)
Non-Members: $125
Students: $50 (limited to first 25)
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Upcoming Meeting

The 2009 Economic Outlook

Speaker: T. Kevin Swift
Senior Director - Policy,
Economics & Risk Analysis
American Chemistry Council

Date: **Thursday, January 8, 2009**
[Note: date is second Thursday]

LONG ISLAND SUBSECTION

HOLIDAY PARTY AND 2009 BOARD ELECTIONS

Did Goldilocks Kill the 3 Bears? The Use of Forensic Science in Investigating Environmental Crimes

Speaker: Dr. Anthony Carpi
Department of Sciences
John Jay College of Criminal Justice, CUNY

Forensic investigative techniques are increasingly being applied to the investigation of environmental crimes. These applications vary widely. For example, they include: chemical fingerprinting for the attribution of liability in chemical or petroleum spills; DNA fingerprinting, ballistics, and other investigations of illegal hunting of wildlife, especially when violations of international trade agreements or the Endangered Species Act are concerned; and epidemiological investigations of disease outbreak when a source of a pathogen may be identified. This seminar will provide an overview of environmental forensic methods and will discuss cases involving these investigations as an introduction to the field.

Anthony Carpi, Ph.D., is a Professor of Environmental Toxicology in the Forensic Science Program at John Jay College of Criminal Justice. Prior to this, he worked as a Pollution Control Engineer with the Connecticut Department of Environmental Protection. Dr. Carpi teaches a graduate seminar at John Jay on the application of forensic investigative tools to environmental crimes, and he has published on the origins and scope of the emerging field of Environmental Forensics. His research focuses on predicting the effect of climate change on the global distribution of heavy metals and waterborne pathogens.

Date: **Thursday, December 4, 2008**
Time: Board elections at 6:00PM
Followed by seminar and complimentary buffet dinner
Place: Nassau Community College
CCB Building, Room CCB-252
Garden City, NY

Directions: **www.ncc.edu/About/directions.htm**

HUDSON-BERGEN CHEMICAL SOCIETY — JOINT MEETING WITH THE CHEMISTRY CLUB OF RAMAPO COLLEGE, AND SIGMA XI, THE SCIENTIFIC RESEARCH SOCIETY

The Global Food Crisis: What Caused It and How to Fix It

Speaker: Dr Ariel Fenster
McGill University

Over the last year the price of rice, wheat and other basic food has soared beyond the reach of the world's poor. Food riots have exploded around the globe in countries as diverse as Mexico, Haiti and Pakistan. In Africa, which was already suffering from widespread food shortages, the situation has become critical. This lectures looks at the causes for the crisis, from the use of food crops in the production of biofuels to the emerging consumer societies in Asia. It then examines some of the possible solutions together with their chance of success.

Ariel Fenster teaches at McGill University, where he is a founding member of the Office for Science and Society, an organization dedicated to disseminating up-to-date information in the areas of food, food issues, medications, and the environment and health topics in general. Dr. Fenster is well known as an outstanding communicator and an exceptional promoter of science with an extensive program, developed over nearly three decades. Over that period he has given close to 600 lectures and public presentations in English and in French across North America and overseas. He appears regularly on TV and radio to discuss health, environmental and technology issues and has presented numerous science segments for children's television. Recently he was seen in French on Radio-Canada's popular daily health show "37,5" and in English on the "Discovery" science show, "What's That All About?" His contributions to teaching, and to the popularization of science, have been recognized by numerous awards. Among them: the "Award for Excellence in Chemistry Teaching" by the U.S. Chemical Manufacturers Association and the "McNeil Medal for the Public Awareness of Science" from the Royal Society of Canada (inaugural award). Ariel Fenster, who is a native of the wine-growing region of Bergerac, France, holds a Master's degree from the University of Paris and a Ph.D. from McGill University.

Date: **Friday, December 5, 2008**
Time: Dinner 6.00 PM
Seminar 7.00 PM
Place: Ramapo College of New Jersey
Mahwah, NJ
Room: Trustees Pavilion 3
Cost: $20, $10 for students. (No cost for seminar only.)

Please contact Ms. Sherrill Cox by e-mail at **scox@ramapo.edu** by **December 1st**.

HIGH SCHOOL TEACHERS TOPICAL GROUP

Bio Related Polymers

Speaker: Dr. Jin Kim Montclair
Assistant Professor
Polytechnic University
Brooklyn, NY

The Protein Engineering and Molecular Design Lab began July 2005. Broadly, our lab is focused on engineering macromolecules. The long-term goal of our lab research is to be able to predictably design or engineer artificial therapeutics, biocatalysts, scaffolds and cells. We seek to provide biologically inspired solutions to address the challenges of human disorder treatment and medicine, sustainable energy and environmental remediation.

Dr. Montclair received a B.S. summa cum laude, Fordham; an M.S. and Ph.D in Bioorganic Chemistry, Yale; and she was a Postdoctoral fellow, California Institute of Technology.

Date: **Friday, December 12, 2008**
Times: Social and Dinner — 5:45 PM
Place: No reservations required
Caffe Pane e Cioccolato
10 Waverly Place at Mercer Street
(South-west corner)
New York, NY

(continued on page 14)

HIGH SCHOOL TEACHERS TOPICAL GROUP

(continued from page 13)

(You eat, you pay cash only, no credit cards.)
Times: Meeting — 7:15 PM
Place: New York University
Silver Center Room 207
32 Waverly Place (South-east corner Washington Sq. East)
New York, NY

Security at NYU requires that you show a picture ID to enter the building. In case of unexpected severe weather, call John Roeder, 212-497-6500, between 9 AM and 2 PM to verify that meeting is still on; 914-961-8882 for other info.

Note: Street parking is free after 6:00 PM. For those who prefer indoor attended parking, it is available at the Melro/Romar Garages. The entrance is on the west side of Broadway just south of 8th Street, directly across from Astor Place. It is a short, easy walk from the garage to the restaurant or meeting room.

ACS NEW YORK SECTION MEETINGS FOR 2009

The Board of Directors Meetings for the New York Section in 2009 are as follows:

January 17 Section Wide Conference
February 13
March 13 Nichols Medal Symposium and Dinner, Crowne Plaza, White Plains, NY
April 17
June 5
September 11
November 13

The regular Board Meetings will be held at St. John's University, 8000 Utopia Parkway, Jamaica, NY. These meetings are open meetings and all are welcome. If you are not a member of the Board of Directors and wish to attend please inform the New York Section Office at 516-883-7510 or **njesper1@optonline.net**.

NEW YORK SECTION NOMINATING COMMITTEE TO MEET IN DECEMBER

The Nominating Committee of the ACS New York Section will meet in December to select candidates for the Section's 2009 elections. The following offices will be filled in this election.

Chair-elect for 2010
Treasurer for 2010-2012
Directors at Large (3) for 2010
Councilors (3) for 2010-2012

If a New York Section member wishes to be a candidate or wishes to nominate a member to hold office, please contact the New York Section office at 516-883-7510 or email to **njesper1@optonline.net**. The names of the candidates will be announced at the New York Section's Section-wide Conference on **January 17, 2009**.

SURPRISE

our editor by calling and saying you appreciate the quality and content of our newsletter. Our editor works hard to maintain a publication of interest to our membership. Oh, and by the way, you could also give credit to our advertisers who financially support us.

North Jersey "Member Spotlight"

Joel C. Barrish
Bristol-Myers Squibb Company

by Anita Brandolini

The North Jersey Section's membership includes many prominent leaders in chemical research and education. These individuals have globally impacted the present environment through their creativity, management, perseverance, and mentoring of future talent. This is the second article in a series of profiles of a collection of such leaders.

With over 25 years of employment, spanning a distinguished career of service with two of the world's major pharmaceutical companies, and experience covering a gamut of therapeutic areas, **Dr. Joel C. Barrish** is unquestionably a leading contributor to the pharmaceutical enterprise and respected drug hunter. Currently, he is Vice-President of Discovery Chemistry at Bristol-Myers Squibb (BMS), where he is the key Chemistry executive responsible for the company's research portfolio in the areas of Immunology / Inflammation and Metabolic Diseases, and oversees departments of over 100 chemists spanning three research sites. He is author or co-author of over 80 technical papers and co-inventor on nearly 40 patents, including being the co-inventor of the anti-cancer agent SPRYCEL® (dasatinib). During his 20 years at BMS, he has been involved in the development of more than 25 drugs that have advanced to the pre-clinical or clinical stage. Prior to joining BMS, he spent several years at Hoffmann-La Roche in Nutley, New Jersey. Dr. Barrish received his Ph.D. in organic chemistry from Columbia University in 1983, and a B.A. in chemistry from the University of Pennsylvania in 1979.

Barrish's involvement with both the scientific and management sides of the drug discovery process have given him a broad perspective on the critical skills for success in today's pharmaceutical industry. In addition to the obvious need to be a competent chemist, he stresses the need for strong communication abilities. "A scientist's proficiency in presenting ideas, and thereby influencing others," he says, "cannot be overstated." Furthermore, he emphasizes the importance of being able to work cooperatively, "…virtually all projects are multi-disciplinary, requiring scientific and technical contributions from a variety of experts. In today's world of flatter organizations, the ability to manage in a matrix organization is essential."

These abilities are not usually learned during a chemist's formal education, Barrish points out. "From my perspective, most students focus on a single area of chemistry too quickly in graduate school…the more well-rounded the chemist, the more creative and innovative they are in problem-solving." He also would like to see development of management skills, the "training of chemists how to lead, especially how to manage people."

The pharmaceutical and chemical industries have undergone major changes in recent years, but Barrish still sees great opportunities in these fields. "While this is a time of great change and uncertainty," he advises, "for young chemists who are creative and innovative, and willing to take risks, this is also an exciting time. Sequencing of the human genome has provided us with enormous numbers of targets to evaluate…better biomarkers will help us obtain clinical answers faster and cheaper…the recent, dramatic increase in the price of oil has offered great potential for research in alternative energy sources." He concludes, "Chemistry truly is central to many sciences – there will always be a need for its best practitioners."

North Jersey Meetings

http://www.njacs.org

FINAL ANNOUNCEMENT

Starting with the January 2009 issue of *The Indicator*, paper copies will be mailed only to individuals who have notified John Penna **before October 1, 2008**, at 4 Cameron Road, Piscataway, NJ 08854 (732-463-7271) or at **njacsoffice@aol.com**.

The January *Indicator* will be posted on the North Jersey web-site. Go to **http://theindicator.org** and see how easy it is to access *The Indicator*.

Other advantages of posting *The Indicator* include: the ability to access previous issues quickly, the capability of enlarging the print size to increase readability, and knowing that you have helped save a tree.

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, December 15, 2008**
Time: 6:30 PM
Place: Fairleigh Dickinson University
College at Florham
Hartman Lounge, the Mansion
Madison, NJ
Cost: $5.00 - pizza dinner

Directions: can be found at **view.fdu.edu/default.aspx?id=238**.

Reservations: call (732) 463-7271 or email **njacsoffice@aol.com** prior to **Wednesday, December 10, 2008.**

Dinner at the Section Meeting is payable at the door. However, if you are not able to attend and did not cancel your reservation, you are responsible for the price of your dinner

TEACHER AFFILIATES

Executive Committee Meeting

Date: **Monday December 8, 2008**
Time: 4:30 PM
Place: Chatham High School
255 Lafayette Avenue
Chatham, NJ

Contact: Cheryl Litman at 1-732-289-3700 Ex 4034, **clitman@mail.nbtschools.org**

ChemTAG MEETING

Alternate Assessment

Date: **Wednesday, December 10, 2008**
Time: 4:00 – 6:00 PM
Place: J.P. Stevens High School
855 Grove Avenue
Edison, NJ

Directions: **http://www.jpstevens.org**

Contact: Paul Sekuler, **researchehs@hotmail.com**

SALUTE TO EXCELLENCE

At the NJ Science Convention on October 15, 2008 Ken Lyons was presented with a Salute to Excellence Award by the North Jersey Section of the American Chemical Society. The statement on the award is below.

The New Jersey Regional Science Fair is a high school competition in which students, individually or in groups, present a wide variety of projects. Most of the projects are investigative in nature, posing and attempting to answer some question or problem, either through experimentation and design or in a theoretical sense. All areas of science, mathematics and engineering are included.

The NJRSF originated in the fall of 1983 as an activity of the Murry Hill Science Education Club based out of AT&T Bell Laboratories. The Fair now involves wide variety of industrial scientists and engineers who volunteer their time to work with students and teachers in local schools.

In administrating the Fair, the volunteers seek to promote, support and reward students and teachers in their research and educational endeavors. Over the years the volunteerism has expanded from not just Lucent Technologies and AT&T Labs but to participants from Honeywell International Inc, Novartis Corportation, the College of Saint Elizabeth, The New Jersey School of Medicine and Dentistry and The New Jersey Institute of Technology. Since 1996, the Fair has gone beyond the Murray Hill Club and exists as an entity of its own but a legacy of that group. Over the past several years the Fair has been presented in close cooperation with Rutgers University.

Over the years, thousands of high school students have benefited from participation and have gone on the participate in the International Science and Engineering Fair which includes students from over 400 affiliated regional fairs throughout the United States and in foreign countries. This week long competition provides outstanding science students with an opportunity for national recognition and encouragement as they embark on their academic careers.

Over the last 25 years, as the Science Fair has grown, Ken Lyons, has been the leader and dynamic force in causing so many benefits to so many students. The North Jersey Section of the American Chemical Society would like to recognize him with this Salute to Excellence.

Presented on the 15th day of October 2008 at the New Jersey Science Convention Recognition Dinner.

For further information, contact:
John Penna
732-463-3987

Ken Lyons (left) receiving the award from John Penna.

2008 MERRILL AWARD

The 2008 Merrill Award was presented to Mridula Bajaj at the NJ Science Convention. Mridula is a chemistry teacher at Science Park HS in Newark and George Gross is the chair of the Education Committee of the North Jersey Section of the ACS. The Edward J. Merrill Award is given annually for excellence in the teaching of HS chemistry.

Call for Applicants

SCIENCE OUTREACH PROGRAM FOR K-12 TEACHERS AND HIGH SCHOOL STUDENTS

Description: This non-residential professional development program exceeds National Science Education Standards by offering mentored lab research internships for K-12 science teachers from public, private and parochial schools in Greater New York City. Our ScienTific Reading And Writing Course (STRAW) teaches the specialized communication skills essential for understanding one's research and teaching those same skills to one's students. Weekly seminars given by Rockefeller scientists extend teachers' knowledge of the research outside of their host labs. Teachers present their research in a Poster Session and in their Research Report. Applications can be downloaded from the Web site. Content: Research in Neuroscience, Medical Sciences, Human Genetics, Immunology, Microbiology, Biochemistry, Structural Biology, Chemistry, Physics, Mathematics, Computer Sciences, Molecular, Cell & Developmental Biology.

Qualifiers: Designed as a two-year program, returning teachers craft Action Plans with the help of Outreach staff that they present at Teacher Seminars. Action Plans describe how teachers will translate their research experiences into inquiry-based learning for their students.

Dates: June 29 – August 14, 2009

Scholarships: No cost and some funding for stipends, travel, and Action Plan. Similar summer program for high school students who must be at least 16.

Application deadline: February 2, 2009 but let us know if you need more time.

Contact: Bonnie Kaiser, PhD, Director, Science Outreach Program, Rockefeller University, 1230 York Avenue, Box 53, New York, NY 10065-6399

Telephone: 212-327-7431 - Fax: 212-327-7519

Email: **outreach@rockefeller.edu**.
Website: **www.rockefeller.edu/outreach**

Education

Call for Nominations

NOMINATIONS SOLICITED FOR 2009 BAEKELAND AWARD

http://www.njacs.org/baekeland.html

The North Jersey Section of the American Chemical Society is soliciting nominations for the 2009 Leo Hendrik Baekeland Award. The award is sponsored by Union Carbide Corporation and consists of a gold medal and a $5,000 honorarium. The Section presents the award biannually to commemorate the technical and industrial achievements of Leo Hendrik Baekeland and to encourage younger chemists to emulate his example. The Award is given in recognition of accomplishments in pure or applied chemistry to an American chemist as characterized by the initiative, creativeness, leadership, and perseverance of the individual (indicated by published or unpublished evidence) and who will be under the age of 40 as of January 1, 2009.

Nominations for the Award should include a letter describing the nominee's achievements, a brief biography, and a list of the nominee's more important publications. Successful nomination packets include two to three recommendation letters supporting the candidate. Re-nominations are encouraged, provided the age requirement is still met.

Please submit materials **by December 31, 2008**, to:

Dr. Michael M. Miller
Baekeland Award Committee
2008 Section Chair, North Jersey ACS
Bristol-Myers Squibb Company
311 Pennington-Rocky Hill Road
Pennington, NJ 08534

THE 2009 LIFETIME ACHIEVEMENT AWARD OF THE NORTH JERSEY SECTION

The biennial award consists of a recognition plaque and $1,000 prize. It recognizes a North Jersey chemist or chemical engineer over fifty years of age, for conspicuous achievements in chemistry, not heretofore recognized by any major scientific awards.

Please submit nominations and supporting letters to Jiwen Chen, Awards Committee Chair, c/o NJ ACS, 4 Cameron Road, Piscataway, NJ 08854. Tel: 609-818-6319, email: **jchen@njacs.org**. Nominations must be received **by February 16, 2009**. Visit **http://www.njacs.org/awards.html** for the nomination form and a list of past recipients.

Others

NOBEL PRIZES IN CHEMISTRY FOR 2008

by Leopold May
The Catholic University of America
Washington, DC

The Royal Swedish Academy of Sciences announced on October 8, 2008 that the Nobel Prize in Chemistry for 2008 was awarded jointly to **Osamu Shimomura**, Marine Biological Laboratory and Boston University Medical School; **Martin Chalfie**, Columbia University; and **Roger Y. Tsien**, University of California, San Diego, for the discovery and development of the green fluorescent protein, GFP.

The brightly glowing green fluorescent protein, GFP, was first observed in the jellyfish, Aequorea victorial, in 1962 by Osamu Shimomura. The jellyfish drifts in the currents off the west coast of North America. He discovered that this protein glowed bright green under ultraviolet light. Martin Chalfie demonstrated the value of GFP as a luminous genetic tag for various biological phenomena. In one of his first experiments, he coloured six individual cells in the transparent roundworm Caenorhabditis elegans with the aid of GFP. Roger Y. Tsien contributed to our general understanding of how GFP fluoresces. He also extended the colour palette beyond green allowing researchers to give various proteins and cells different colors. This enables scientists to follow several different biological processes simultaneously.

RUTGERS UNIVERSITY GRADUATE SEMINAR SERIES — FALL 2008

Materials Science & Engineering

December 2
"Nanomaterials for Defense Applications"
Dr. Chris Haines
Picatinny Arsenal, Dover, NJ ,
chris.haines@us.army.mil

December 9
"Characterization of nano-bio-materials*"
Prof. Jonah Erlebacher
Materials Science & Engineering
Johns Hopkins University, Baltimore, MD
jonah.erlebacher@jhu.edu

Date: **Tuesdays**
Times: Refreshments 11:45 AM
Seminar 12:10 PM
Place: Center for Ceramic Research
Room 201, 607 Taylor Road
Busch Campus
Piscataway, NJ

*Note, titles are tentative at this time.
Questions: contact Lisa C. Klein, **licklein @rci.rutgers.edu** or 732 445-2096.

Contribute to *The Indicator*

The Indicator is interested in adding new features to the publication. Your input would be appreciated. Please let us know features you would like to see in future issues; i.e., historical stories, book reviews, member news, short articles about your research or other ideas. It has been suggested that we might include a "Remember When?" section where our readers could provide photos (with captions) and/or short articles about their careers, awards, memorable symposia they attended, or to honor a colleague.
In the past we have run crossword and CHEMdocu puzzles.
Would you be willing to assist in gathering or writing such material?

Contact the Editor at:
linatkins@tampabay.rr.com or Fax: (352) 200-5195

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Professional/Product Directory

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