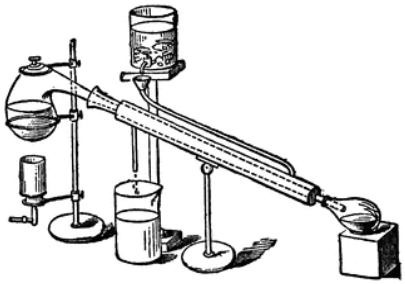
SOUTHWEST RETORT



SIXTY-SIXTH YEAR **SEPTEMBER 2013**

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Chemists, Chemical Engineers
and Chemistry in this area

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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The ACS Southwest Regional Meeting is scheduled for this December in Houston. The Houston Regional Meeting Committee hopes to beat the all-time attendance mark of 1020 set in Dallas last year. Since the last regional meeting held in Houston, the town has landed the Manned Space Center. Also, with rich stores of resources of oil, gas, sulphur, lime, and salt, Houston has mushroomed into a major chemical center.

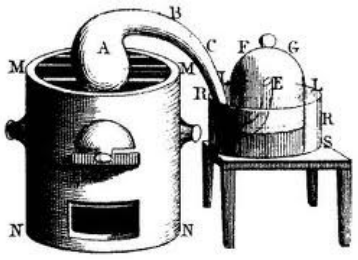
At the University of Texas **Professor W. A. Noyes, Jr.** attended the Congress of the IUPAC meeting in London. Noyes is the President of this organization. He also has received the Austin Patterson Award for "Contributions to Publications", which is given by the Dayton ACS Section. He spent the month of August at Argonne National Laboratory doing research on the triplet state of benzene. The new Dean of the College of Engineering is **Dr. J. J. McKettta**. **Drs. J. E. Boggs** and **L. F. Hatch** attended a symposium on molecular structure and spectroscopy in Columbus, OH. Over the summer **Dr. Norman Hackerman** gave a lecture at UCLA, and **Dr. R. M. Roberts** gave seminars at Arizona, Arizona State, UCLA, UC-Berkeley, and Stanford.

Dr. Dwight C. Conway has joined the chemistry faculty at Texas A&M as an Associate Professor. The A&M faculty members attending the September ACS National Meeting are **Professors A. F. Isbell** and **Bruno Zwolinski**.

The NSF Summer Science Institute for High School Teachers took place on the Baylor campus. **Dr. Virgil Tweedie** taught the chemistry course. Visiting lecturers were **Dr. William B. Smith** from TCU and **Dr. Robert W. Higgins** from Texas Woman's University. Baylor faculty members recently receiving grant renewals were **Drs. John S. Belew, T. J. Bond, Thomas C. Franklin, James L. McAtee,** and **A. G. Pinkus.** The new $2 million science building housing chemistry and physics is ready for occupancy. Two new pieces of equipment have been ordered for installation in the new building: a $48,000 Varian HR-100 NMR spectrometer amd a $32,000 Hitachi electron microscope.

At the University of Arkansas **Dr. Paul K Kuroda** was honored at the spring commencement by being by the University of Arkansas Alumni Association as an outstanding faculty member.

Contributed by E. Thomas Strom

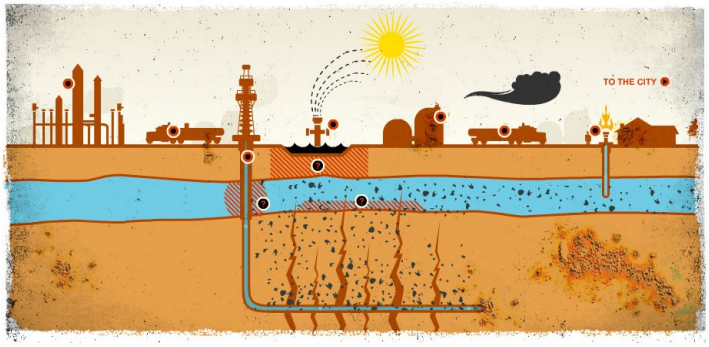


Obtaining Oil and Gas by Fracking: Environmental Issues

by
John E. Spessard, PhD, PE

Hydraulic fracturing (fracking) of hydrocarbon bearing formations was first done commercially in 1949. In 2010, it was estimated that 60% of oil and gas wells had been fracked. Fracking of shale formations has made available large amounts of natural gas and made it both much cheaper and more available. There are environmental concerns associated with fracking, and I am attempting to provide a balanced perspective. This may mean that I will leave both sides unhappy.

The pro-fracking group hold that the anti-fracking group has made up their minds that fracking is irretrievably evil and only seeks evidence to justify their position. The anti-fracking groups hold that ALL pro-fracking literature is either financially supported by the oil and gas industry or is under intense pressure to provide positive results. I was unable to find a middle ground. The Reader is welcome to believe that the anti-fracking crowd work for free out of the goodness of their hearts. Possible interested sources for financing anti-fracking studies could be nations that sell crude oil to the United States such as Canada, Mexico, Nigeria and Venezuela. Other parties might be American Refineries that specialize in refining high sulfur, viscous foreign crude oil.



Fracking for natural gas involves pumping into the shale formation under pressure (3,600 psi cited) of a mixture that is about 99% water and sand. Additives include surfactants, corrosion inhibitors, biocides and solvents. The oil and gas operators hold that the identity and levels of the additives is proprietary information and will not identify them. Some states are requiring disclosures of the identity of the additives but the industry is very reluctant to provide this information. A radioactive tracer is sometimes added to trace the flow of the fracking fluid. Some of the fracking fluid returns to the surface. Pollution resulting from the handling of this fluid is a concern. Naturally occurring radioactivity is a particular concern.

Hydrocarbon Emission Concerns

Natural gas is primarily methane with lesser amounts of higher hydrocarbons (ethane, propane, isobutene, butane, etc.) The higher hydrocarbons are more valuable and are removed from the methane. Also accompanying the natural gas are hydrogen sulfide and me captains. Before the natural gas is put into a steel pipeline, these sulfides MUST be removed by converting them to elemental sulfur. Otherwise, you have a very expensive method of making ferrous sulfide. Natural gas goes through the pipe

line under pressure. So the sulfur recovery unit (SRU) and the compressor are essential parts of the system and are potential sources of methane leaks. The sulfur recovery unit and compressor station are normally located in remote areas where emissions are less likely to be noticed. Any valve, pump or fitting handling methane under pressure is a potential leak. The opponent's position is that if ANY hydrocarbons are found where fracking takes place, fracking is to blame.

There are two potential sources for methane in ground water. The first is biogenic or organic material decomposition. This can take place near the surface. The second is thermogenic, the thermal decomposition of buried organic material. Natural gas falls into this category. I attended a local section AIChE meeting. The speaker was a geologist whose job was to locate good places to drill for oil. He told us that one promising clue was "distressed vegetation" that might be caused by near surface hydrocarbons (or mercaptans). Biogenic and thermogenic methane can supposedly be differentiated by isotopic abundance (possibly C14 levels). I found no evidence of any such determinations having being made.

Natural gas usually has hydrogen sulfide and mercaptans present. I would expect people to complain about the odor of gas from fracking operations. The concerns that I have seen have been mainly flammability rather than odor. I am unaware of any lawsuits where the presence of hydrocarbon emissions has been definitively traced to the fracking process.

Environmental Organizations have pursued litigation strategies to curtail shale oil and gas development. The initial strategy was to sue for physical and property damages. Some cases were settled out of court. Others were dismissed with and without prejudice." With prejudice" means that the case can't be reopened. A newer strategy is to sue requiring regulatory agencies to conduct more studies and delay implementation to where it becomes uneconomic.

This strategy has worked well with the Keystone Pipeline Project. There has been a continuing demand for additional studies to justify the environmental safety of the project. Concerning the pipeline, I am convinced that there will NEVER be enough studies.

Water Quality Issues

I believe surface or near-surface water quality to be the more serious concern. I have found that drawing inferences from what did not happen to often be very informative. I first learned this from the Sherlock Holmes story "Silver Blaze". Holmes deduced that the failure of a large fierce dog to bark when the murderer came in the scene was because the dog knew the murderer. This was the key to solving the mystery.

A single fracking well can use 5 million gallons of water. 5 million gallons is 1.155 billion cubic inches or 41.4 inches of water on a 640 acre farm (one square mile). That is a year's allotment of water for that farm.

The economic development of much of the American West and Southwest is water-limited (Stage 2 and Stage 3 restrictions in the DFW area are an example). I am unaware of any activity to limit water usage in well drilling. Some of this treated water returns to the surface. This water is held by the petroleum industry to be a disposal problem and an expense that takes from the bottom line.

A fine chemical engineer told me that you do not understand a reaction or process until you have completed a material and energy balance. I have seen NO measurements of how much of the 5 million gallons returns to the surface after drilling. The preferred disposal method is underground injection into disposal wells far below the surface. Sometimes injection well disposal has generated seismic activity. This has happened not only in fracking operations but also in disposal of radioactive wastes from Rocky Mountain Arsenal (in 1968) and in disposal of wastes from TiO2 pigment manufacturing. So this is a generic problem rather than a problem specific to oil and gas fracking.

Prior to well injection, the waste liquids have been stored in unlined earthen dikes. Leaks are an efficient way to contaminate surface water supplies. Lined ponds and steel tanks have been used for interim storage. This prevents leakage into surface water sources but it does raise disposal costs 10%. Waste liquids have been successfully treated in municipal waste water treatment plants. I have been on plant tours of the Dallas City plant and a North Texas Municipal Water District plant.

These plants boast that their treated water is superior to the intake water of potable water supplies. North Texas used the treated waste water for golf course and landscaping irrigation. While technically feasible, recycling as potable water, as of now is psychologically unacceptable. These plants do not remove naturally occurring radioactive materials.

One site was reported to reduce the volume of waste water (and the disposal cost) by spraying it in air to evaporate it. I took primitive P-Chem where instead of wave functions, we studied Henry's Law (formulated in 1803) which states that the solubility of a gas in a liquid is directly proportional to the pressure. The fracking water is charged with hydrocarbons and mercaptans at 3600 psi. At the surface is stored at atmospheric pressure and is aerated. What will happen to the dissolved hydrocarbons and gases? There just might be emissions.

In my opinion, a water supply-limited community pays an economic price in limited development for the water used in fracking. The water used and water recovered should be measured. The type of additives used should be controlled such that the waste water can be recovered and reused. This would reduce net water consumption. At the very least, the quantity of water into the well and from the well should be known. I can accept the concept of the fracking additives remaining proprietary information provided that the waste water is successfully treated in a municipal waste water treatment plant or equivalent.

Click anywhere on the graphic above to access the website!

You are cordially invited to submit an **abstract** and/or **register** for the 69th Southwest Regional Meeting of theAmerican Chemical Society being held at the Waco Convention Center November 16-19, 2013.

The meeting will feature an exceptional **technical program** including symposia covering a wide range of interests, posters, workshops, a vendor exhibition, a grad school fair, a high school program (Saturday 11/16), and an exciting and diverse undergraduate program. Plenary talks will be given by Professor Donald Blake (UC Irvine), and Stephen Fesik (Vanderbilt). Other highlights will include Dr Pepper floats, a recreational run/walk/ride (your choice), and tours of the award-willing **Balcones Distillery** and the **Armstrong-Browning library**. Information on the meeting location, the program, and our special events can be found at the meeting website **www.swrm.org**.

Waco is a great town centrally located in the region and easily accessible by car, bus, train (Amtrak stops in near-by McGregor), and by plane (ACT is the code for the Waco Regional Airport). The Waco Convention Center and the host hotel (the Waco Hilton) are steps from 15+ restaurants and pubs and close to a number of Waco attractions.

DEADLINES

ABSTRACT SUBMISSION
SEPTEMBER 30

EARLY REGISTRATION NOVEMBER 1

LINK to SWRM.ORG

...And another thing…

By Denise L. Merkle

Last year, I was the victim of anti-fraud. Actually, victim is too strong a term. I merely *suffered* from anti-fraud. The dreaded identity theft didn't get me, but anti-identity theft measures did.

Hunched against a shop front in a bustling European capital city, ineffectively sheltering my phone conversation from passersby, I communicated with the credit card company that had declined to authorize a purchase. I pointed out that, although it might *seem* dangerous for me to actually use my own card to buy something, it was, *in fact*, more seriously insecure for me to shout my credit account's access codes- into a cell phone no less- from a busy sidewalk. The call center employee was immune to the irony. I ultimately prevailed; Many background-noise-plagued conversations later, the inconvenient and embarrassing issue was resolved - until the following day, when I was again protected from the horrors of purchasing souvenirs. (And yes, apparently, one is expected to notify the credit card company when one intends to travel to a bustling European capital, even if one used that exact credit card to purchase the plane tickets to visit that exact capital. This is to prevent expenses for the card's bank.)

All this checking, and re-checking, blocking of purchases to prevent fraudulent transactions, and re-issuing of cards because 'a security breach may have occurred' made me wonder: Why do we consumers have no recourse against the Identity Thieves? Why does the onus of preventing identity theft devolve upon the customers, and not onto the perpetrators? Are these nefarious persons too hidden behind raging electrons? Are they too faceless? Are the victims such a composite that they can't be notified of who has stolen their data? Anyone who has been forced to change every single repeating payment knows how stressful and time consuming these thefts are. Yet there is not much a consumer can do after an incident - except damage control.

What is the point of this, you ask? The point, at least for me, is that the anonymous nature of these crimes means that we, as customers, are not permitted to respond as we would to a more physical crime. There's no option to request -or demand- compensation for the hours spent re-entering card numbers and poring over statements to confirm that we paid for only what we intended to buy. There's no one to bill for the distress of finding that one's cards have been blocked, adversely affecting if not ruining the enjoyable vacation.

What response would be forthcoming if everyone who has been inconvenienced were afforded the opportunity to confront the perpetrators of these indirect crimes and, um, *explain* the aftermath? Would the level of Identity Theft be decreased by the ability of victims to express their outrage - and receive a percentage of the take for their aggravation? Maybe. Maybe not. But the experiment would be worth a try. Au revoir.

ID Theft Info:

http://www.ojp.usdoj.gov/ovc/pubs/ID_theft/pfv.html

http://www.consumer.ftc.gov/features/feature-0014-identity-theft

DFW Section Awards 2013

Doherty Award Winner
Thomas R. Cundari
Univ. of North Texas

Doherty Award Lecture
September 24

Thomas R. Cundari obtained a B.S. in Chemistry at Pace University in New York City. After completing his Ph.D. at the University of Florida with Professor Russell S. Drago, he spent a postdoctoral year at North Dakota State University in Fargo with Professor Mark S. Gordon (now at Iowa State University). He joined the faculty of the University of Memphis in 1991, rising through the ranks to Dunavant Professor. In 2002, he moved to University of North Texas as Full Professor, and was promoted in 2008 to Regents Professor. . Research in the Cundari group is focused on modeling metals in catalysis and inorganic/organometallic chemistry with emphasis on integration of theory and experiment.

Schulz Award Winner
Robyn Ford
Denton HS
Advanced Technology Center

Schulz Award Lecture
November 13

Robyn Ford earned her BS in Chemistry and Mathematics from West Texas State University, now West Texas A&M University, a M.Ed. in Educational Administration and MS in Chemistry from The University of North Texas, and is currently working on a Ph.D. in Chemistry Education from The University of North Texas. She is currently conducting research in forensic chemistry and chemistry education. Ms. Ford has taught high school chemistry in Amarillo, Texas, five Dallas-Fort Worth area districts and is currently teaching at Denton High School in Denton. She has taught AP Chemistry since 1995, has been a test item writer for College Board, and was the revision author for CliffsNotesÒ Chemistry Quick Review. In 2012 she was the R. B. Escue Chemistry Endowment Award winner for Outstanding Scholarship in Chemistry Education. Additionally, Ms. Ford has taught at the college level, most recently at The University of North Texas.

From the ACS Press Room

Water purification with papaya seeds and clay

Hybrid Clay: A New Highly Efficient Adsorbent for Water Treatment

ACS Sustainable Chemistry & Engineering

An inexpensive new material made of clay and papaya seeds removes harmful metals from water and could lower the cost of providing clean water to millions of people in the developing world, scientists are reporting. Their study on this "hybrid clay" appears in the journal *ACS* ***Sustainable Chemistry & Engineering.***

Emmanuel Unuabonah and colleagues explain that almost 1 billion people in developing countries lack access to reliable supplies of clean water for drinking, cooking and other key uses. One health problem resulting from that shortage involves exposure to heavy metals such as lead, cadmium and mercury, released from industrial sources into the water. Technology exists for removing those metals from drinking water, but often is too costly in developing countries. So these scientists looked for a more affordable and sustainable water treatment adsorbent.

They turned to two materials readily available in some developing countries. One was kaolinite clay, used to make ceramics, paint, paper and other products. The other: seeds of the *Carica papaya* fruit. Both had been used separately in water purification in the past, but until now, they had not been combined in what the scientists term "hybrid clay." Their documentation of the clay's effectiveness established that the material "has a strong potential for replacing commercial activated carbon in treatment of wastewater in the developing world."

Related article:

Removal of Cu(II) from Water by Adsorption on Papaya Seed:

http://www.asian-transactions.org/journals/vol01issue05/ate/ate-40117055.pdf

DFW Section

Letter from the Chair-Elect

Dear colleagues,

Welcome back to a new academic year that's going to be jam-packed with programming!

The 69th Southwest Regional Meeting will be held just down the road in Waco on November 16-19, followed by the 247th National Meeting here in Dallas March 16-20. It doesn't end there—our own Kirby Drake is working on planning the 70th Southwest Regional Meeting to be held in Fort Worth in 2014. I encourage you to take advantage of these opportunities to get involved at the regional and national level.

Local section activities are already ramping up in planning for National Chemistry Week in October, local section meetings, and activities with the Climate Science grant.

Congratulations to Thomas R. Cundari, *University of North Texas,* the 2013 Doherty Award winner, and Robyn Ford, *Denton High School*, the 2013 Werner Schulz Award winner. Join us as we honor them at our September and November local section meetings.

See you all on September 24!

-Katie Walker

2013 Chair-Elect Our local section is undergoing exciting changes!

Keep an eye out for these current and upcoming developments:

- Online voting for local section offices (available now)
- Paying for local section meetings in advance with a credit card (you no longer have to remember to get cash while you are running late to the meeting!)
- Younger Chemist Committee (YCC) Programming—keep an eye out for a webinar event in October on managing your resumes
- Non-traditional meetings (PhD Comics movie on Mole Day, heck yeah!)
- Leadership Development Course Programming

Fall Local Section Meeting Dates, Topic, and Locations

Tues. Sept. 24, Doherty Award Lecture, Professor Thomas R. Cundari, Oakmont Country Club (Corinth)

Wed. Oct. 23, The PhD Movie, DFW Alamo Drafthouse (Richardson)

Wed. Nov. 13, Schulz Award Lecture, Robyn Ford, Denton HS Advanced Technology Center (Denton)

DFW Section Meeting

September 24, 2013

Doherty Award Lecture

Thomas R. Cundari

Computer-aided Catalyst Design: Or, Can a Blind Squirrel Find an Acorn?

Thomas R. Cundari obtained a B.S. in Chemistry at Pace University in New York City. After completing his Ph.D. at the University of Florida with Professor Russell S. Drago, he spent a postdoctoral year at North Dakota State University in Fargo with Professor Mark S. Gordon (now at Iowa State University). He joined the faculty of the University of Memphis in 1991, rising through the ranks to Dunavant Professor. In 2002, he moved to University of North Texas as Full Professor, and was promoted in 2008 to Regents Professor. Research in the Cundari group is focused on modeling metals in catalysis and inorganic/organometallic chemistry with emphasis on integration of theory and experiment.

Oakmont Country Club

1901 Oakmont Dr, Corinth, TX, 76210

Social Hour: 6:00-7:00pm Dinner 7:00-8:00pm Lecture: 8:00-9:00pm

Menu: Barbeque buffet (brisket, chicken) with sides and dessert (plated vegetarian alternative available by request). Meal includes tea, water, and coffee. A cash bar will be available with soda, beer, and wine.

$20 per person

Payment by credit card will be available online in advance, but only cash or check will be accepted at the door. After you RSVP, an invoice will be emailed to you to allow you to pay online with your credit card.

RSVP Online (http://bit.ly/18xXljx)
by Monday, September 16, at 5pm.

Questions? Contact Chair-Elect Katie Walker at
kawalker@austincollege.edu or (903) 813-3159.

DFW Section News cont.

On behalf of the Younger Chemists Committee, **the UT- Arlington Chemistry Graduate Students Association** presents a live screening of a webinar titled:

Putting Your Best Foot Forward:

Managing Your Paper and Online Resumes

Sponsored by ACS YCC, LSAC, ACS Careers, and ACS Webinars®.

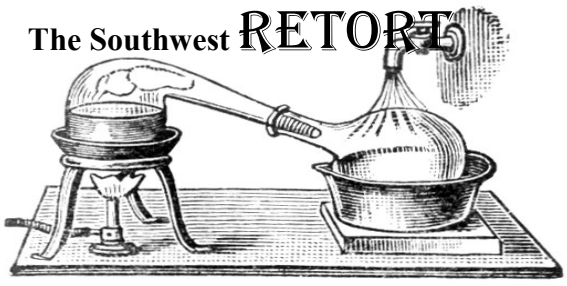
Date: Tuesday, October 8th

Time: 6pm (social starts at 5.30)

Venue: UTA
The Planetarium (Chemistry and Physics Building), Room 303
700 Planetarium Pl Arlington, TX 76019
For more details, contact

Wasiu Lawal:
wasiulawal79@yahoo.co.uk
or

Eugenia Narh:
eugenia.narh@mavs.uta.edu



To volunteer for the 2014 Southwest Regional ACS Meeting! SWRM 2014 will be held at the Fort Worth Renaissance Worthington Hotel, November 19-22, 2014. If anyone would like to suggest a topic or organize a symposium, please contact Kirby Drake
kirby.drake@kk-llp.com

or Danny Dunn
dannyldunn@sbcglobal.net

IN MEMORIUM: RONALD ESTABROOK

The wide world of biochemistry and the Dallas-Fort Worth area in particular suffered a great loss with the death of Professor Emeritus **Ronald W. Estabrook** of UT-Southwestern on Aug. 5 from congestive heart failure. Ron Estabrook came to UT-Southwestern in 1968 as Virginia Lazenby O'Hara Professor of Biochemistry and as Chair of the Biochemistry Department. It is safe to say that Ron and the marvelous faculty he recruited put biochemistry at UT-Southwestern on the map. Besides serving as department chair, he also was dean of the Graduate School of Biomedical Sciences. After serving in administration, he returned to laboratory research in 1980, and he retired in 2006.

Ron was born in Albany, NY, on Jan. 3, 1926. He joined the Navy at age 17 to serve in World War II. He went to officer training school and was commissioned an ensign, serving on destroyer escorts and on mine sweepers. After the war, he received his bachelor's degree from Rensselaer Polytechnic Institute in 1950. Although he was accepted to medical school, he had become excited by research, so he went on for a Ph.D. at the University of Rochester. Afterwards, he obtained an appointment at the University of Pennsylvania Johnson Foundation for Research in Medical Physics. While there, he and two colleagues made the ground-breaking discovery that cytochrome P450 was the enzyme responsible for steroid and drug oxidation in microsomes and mitochondria.

To cite just a few of his honors, The North American Scientific Achievement Award of the International Society for the Study of Xenobiotics is named for Ron Estabrook, and in 1979 he was elected to the National Academy of Science. Ron won the Wilfred T. Doherty Award of the DFW ACS Section in 1981, and he was selected as the winner of the ACS Southwest Regional Award in 1989. He was only the second winner of this award from the DFW Section.

Besides his wife June, Ron is survived by daughters Linda Gilbert, Laura Verinder, and Jill Estabrook and son David Estabrook, seven grandchildren, and five great-grandchildren.

The DFW chemistry community remembers a warm individual who brought great distinction to his university and to this area.

Obituaries may also be found on the **Dallas Morning News** and **Restland** sites.

Around the Area

Texas Tech University

Three new Assistant Professors join TTU this fall:

Anthony Cozzolino received his PhD at McMaster University and did a postdoctoral stint at MIT. His research area is inorganic and supramolecular materials chemistry.

John D'Auria comes from a postdoc at the Max Planck Institute for Chemical Ecology and with a PhD from the University of Michigan. His general research area is biochemistry, with interests in biochemistry and evolution of tropane biosynthesis and plant metabolic engineering.

Gerardo Gamez holds a PhD from Indiana University and did postdoctoral work at the Swiss Federal Institute of Technology in Zurich. He is an analytical chemist with research interests in chemical imaging, optical spectroscopy, and mass spectrometry.

Austin College

The Austin College chemistry department moved into a new science facility, the IDEA Center, this fall. The LEED-certified building is designed for interactive learning and interdisciplinary studies, including 16 classrooms, 32 advanced laboratory-classrooms, a 108-seat auditorium, and an observatory. The center houses the departments of biology, chemistry, computer science, environmental studies, mathematics, and physics.

UT Arlington

Daniel Armstrong, Robert A. Welch Professor at UTA Dept. of Chemistry and Biochemistry, delivered the keynote lecture at the 37th International Symposium on Capillary Chromatography ISCC) in May, and in June was named Chair of the 39th ISCC to be held in Fort Worth in 2015. In 2013, he was named an ACS Fellow.

UTA cont.

John Gurak, a UTA undergraduate, has been awarded a 2 year EPA fellowship to work on green chemistry in the laboratory of **Frank Foss.** Gurak is working with Foss to adapt riboflavin as a metal-free catalyst in oxidative reactions that create heterocycles. Heterocycles have wide-ranging uses and are important to the future of pharmaceutical development and manufacturing of materials such as light-emitting diodes.

Gurak, a graduate of Denison High School in Denison, is a recipient of several scholarships at UT Arlington, including the President's Charter Scholarship. He also serves as a residential assistant at the Welch Summer Scholar Program, a five-week residential summer camp for high school students interested in scientific research. Earlier this year, he was a co-author on a peer-reviewed paper that appeared in ***Langmuir***.

Lecturer Dr**. Seiichiro Tanizaki** has been selected as one of nine UT-Arlington winners of the UT Regents Outstanding Teaching Awards. This award carries an honorarium of $25,000. In 2012 he received the UT-Arlington Provost's Award for Excellence in Teaching.

Associate Professor **Peter Kroll** received two new grants to develop methods and investigate extremely hard materials and high temperature resistant coatings. One project is sponsored by DARPA, "Cubic Boron Nitride: a Model for Extended Solids Processing," in which Kroll will work with co-investigators Olivier Sudre of Teledyne and Yigal Blum of SRI International. Kroll is also a member of an interdisciplinary team that receives funding through the Materials Genome Initiative. The topic is "Multiscale Design of Hard and High Temperature Resistant Coatings by Computation and Experiment." Co-investigators include Traian Dumitrica of the University of Minnesota and Efstathios Meletis and Jiechao Jiang of UT-Arlington

Professor **Krishnan Rajestwar** and Assistant Professor **Frank Foss** have received a three-year, $360,000 NSF grant titled "International Collaboration in Chemistry. Bioinspired Heterogeneous Photocatalyst Assemblies." Their international collaborator is Professor Yaron Paz of Technion-Israel Institute of Technology. Professor Yaz is funded for $200,000 by his home country to support this effort. This international collaboration will involve students traveling overseas for month-long exchanges.

Frank Foss

UTA cont.

Professor **Rajeshwar** has been elected as a Vice President of The Electrochemical Society, a position which means that he will go through the sequence to become President of the Society in a few years.

Professor **Frederick M. MacDonnell** and Dr. **Norma de Tacconi** have received a three-year, $430,000 NSF grant to study "SusChEM: Deep Photochemical Reduction of Carbon Dioxide to Methanol."

University of Arkansas

Dr. **Jerry King** of the University of Arkansas has been named a Fellow of the Industrial & Engineering Chemistry Division and will be inducted at the upcoming 2014 Spring Meeting at the ACS in Dallas, March 16-20, 2014. A symposium honoring Dr. King will be held at the ACS meeting within the I&EC's Division program. Professor King is being recognized for his multidisciplinary research in chemical separations, particularly in supercritical fluid technology - in the areas of chemistry, chemical engineering, and food technology – embracing physical and analytical chemistry, chemical engineering, and food and agricultural materials processing and characterization.

Faculty Activities:

Chen, J., Taylor, E., Chen, S., and Mathurin, L.. Synthesis of Cu-Pt Bimetallic Nanostructure for Electro-Oxidation of Alcohol, Cluser, Nanocrystals & Nanostructures, Gordan Research Conference at Mt. Holyoke College, South Hadley, MA; Poster (August 4-9, 2013).

Mya Norman attended the Wally Cordes Teaching and Faculty Support Center's Teaching Camp at the Winthrop Rockefeller Center from 8/3-8/5/13. She did a presentation with Tim Kral on teaching large classes. **Neil Allison** also attended and made a presentation.

Publications:

Reena Chandrashekar and **Paul D. Adams**. Prospective Development of Small Molecule Targets to Oncogenic Ras Proteins. *Open Journal of Biophysics*, Vol. 3, #4, in press, 2013.

Taylor, E., Chen, S.; Tao, J.; Wu, L. Zhu, Y.; **Chen, J.** Synthesis of Pt-Cu Nanodendrites by Controlling Reduction Kinetics for Enhanced Electro-Oxidation of Methanol. *ChemSusChem* 2013, accepted.

Jeon, M.; **Jenkins, S.V.**, Oh, J.; M.-C. Chalbot, G. Nikolic, V. Etyemezian, D.W. Dubois, J. King, D. Shafer, G. Gamboa da Costa, **J.F. Hinton**, I.G. Kavouras. Soil humic-like organic compounds in prescribed fire emissions using nuclear magnetic resonance spectroscopy. *Environmental Pollution*, 181, 167-171, 2013.

Kim, J.; Peterson, T.; **Chen, J.** Kim, C. Nonionizing Photo-acoustic Cyctography with Near-Infrared Absorbing Gold Nanostructrues as Optical-Opaque Tracers, Nanomedicine, in press.

From the ACS Press Room

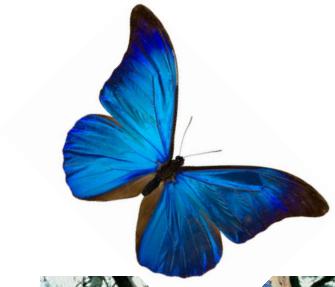
Butterfly wings + carbon nanotubes = new 'nanobiocomposite'

Self-Assembled Carbon Nanotube Honeycomb Networks Using a Butterfly Wing Template as a Multifunctional Nanobiohybrid *ACS Nano*

Leveraging the amazing natural properties of the *Morpho* butterfly's wings, scientists have developed a nano-biocomposite material that shows promise for wearable electronic devices, highly sensitive light sensors and sustainable batteries. A report on the new hybrid material appears in the journal ***ACS Nano***.

Eijiro Miyako and colleagues explain that *Morpho* butterfly wings have natural properties that are beyond the capabilities of any current technology to reproduce artificially. In addition to being lightweight, thin and flexible, the butterfly's wings absorb solar energy, shed water quickly and are self-cleaning. Miyako's group had been working with tiny cylinders of carbon termed carbon nanotubes (CNTs), and became fascinated with CNTs' unique electrical, mechanical, thermal and optical properties. Miyako's team set out to marry the wings and nanotubes to produce an all-new hybrid material.

They describe growing a honeycomb network of carbon nanotubes on *Morpho* butterfly wings, creating a composite material that could be activated with a laser. The resulting material heated up faster than the original components by themselves, exhibited high electrical conductivity and had the ability to copy DNA on its surface without absorbing it. "Our present study highlights the important progress that has been made toward the development of smart nanobiomaterials for various applications such as digital diagnosis, soft wearable electronic devices, photosensors, and photovoltaic cells," the scientists state.

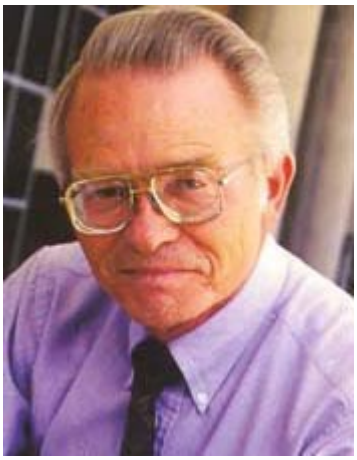


The authors acknowledge funding from the Japan Society for the Promotion of Science.

INTERVIEW WITH ACS PRESIDENT-ELECT THOMAS J. BARTON

Interviewer E. Thomas Strom

The President of the ACS has to wear several hats. One of the most important is Communicator-in-Chief. Our president is the face of our Society to the public at large. He/she should be a superb communicator with a gift for putting things in a way that is understandable to the general public. Administrative ability is another important strength. Of course, Madeleine Jacobs is not going give up the day-to-day running of the ACS to the ACS President, no matter how gifted he/she may be in that area. However, knowing how a big organization runs is very useful in promoting constructive interactions between the President and the ACS staff. Presidents coming from academia are very often at a disadvantage in that area. This is definitely NOT true for President-Elect Tom Barton, because after a successful academic career at Iowa State University, he also had a fine career as Director of the DOE Ames Laboratory associated with Iowa State.



Tom Barton was born in an orphan's home in Dallas, but he only was there three weeks before he was adopted. He was raised first in Corpus Christi, TX, then Galveston Island, and finally in a sleepy village 45 miles from the Gulf called Wharton, TX. Tom feels his career in chemistry was something of an accident. During his sophomore year of high school, he had what he hopes was the worst teacher ever in chemistry. The teacher turned him off to all science. When Tom went to community college, it was on a music scholarship with interests in voice and clarinet, but his ultimate idea was to major in pre-law. His freshman advisor told him he would have to take a class in science, so she advised that he take something called Chemistry 117. When Tom asked what was this Chemistry 101 that was listed, his advisor patted him on the shoulder and told him that was for people who were *good* in science. That ticked Tom off, so he said that he would be taking Chemistry 101. Fortunately he had a good teacher for Chemistry 101. He went to Lamar University for his B.S. Chem and then to the University of Florida, where he did his Ph.D. with Merle Baptiste. Merle was Ron Breslow's first graduate student, and Tom was Merle's first graduate student.

Tom came to Iowa State University in 1967. He instituted a research program in organosilicon chemistry and had an outstanding academic career. He progressed through the ranks to full professor, and among some of his honors were the ACS Kipping Award for organosilicon research in 1982, a departmental teaching award in 1975, the Iowa governor's science teaching medal in 1983, a faculty achievement award for excellence in teaching in 1988, and the ACS Midwest Award in 1995. By

all standards, this was a fine academic career, but how did Tom wind up in administration?

First, as a person who received a Ph.D. in physical organic chemistry from Iowa State, let me give you readers some background on where organic chemistry was positioned in the ISU chemistry department pecking order. Ames Lab has been at Iowa State since the days of the Manhattan Project, although sometimes under other names. Almost every faculty member in physical chemistry, inorganic chemistry, and analytical chemistry also had an Ames Lab appointment. For practical purposes, that meant graduate students in those areas were guaranteed research assistantships at Ames Lab after their first year of laboratory teaching, If you were an organic graduate student, you had to hope that your mentor got research grants, or else you were a teaching assistant all your graduate career. As organic graduate students our perception was that Ames Lab research assistants only worked from 9 a.m. until 5 p.m. weekdays, while we organic graduate students had to work until midnight seven days a week. Bottom line---organic faculty were well insulated from Ames Lab.

Tom says first of all that he has been very fortunate in that he has never had to "work his way up in life." (Actually I think his career counters that perception.) For the first 18 years that Tom was at Iowa State, he had nothing whatsoever to do with the Ames Lab. Then, one day, an associate director of Ames Lab called Tom to tell him that Ames Lab needed to get into ceramics---silicon carbide and silicon nitride. Tom talked to an Ames Lab chemical engineer and gave him some of his ideas on how to thermally convert organosilicon compounds into silicon carbide. The next day the associate director asked him if he would join Ames Lab for a limited time. Tom did so. Next came an offer to be program director of materials chemistry. Tom thought he would not like administration, but he did want to try something new, so he accepted. For three years he was program director of materials chemistry, and he also carried out his own research program in pre-ceramic polymers.

The director of Ames Lab when Tom joined up was physical chemist Robert Hansen. When Hansen decided to retire, a number of people asked Tom if he would consider being a candidate for director. Tom agreed, and in retrospect he thinks he did so because it appealed to his sense of the grotesque---an organic chemist being director of Ames Lab! The competition for Ames Lab director was a national competition, not local. As people were being eliminated and it appeared he might have a chance at the position, Tom sent a letter to the president of the university withdrawing from the process. The president twisted Tom's arm to keep his name in, so he agreed to remain in the competition. He made the final group of three. He was at a conference in Paris, having a good time, when he got the word that he was chosen. He responded that he was in a good place in his career just now, so he would turn down the position. The response was that they would have to start the search all over again, leaving Ames Lab without a director for another full year. Did he want that? He responded, "You son of a bitch! OK, I'll take it." And for 18 years he had it.

Tom retired at age 66 and went back into teaching, absolutely no research, and he taught for five years---undergraduates only---and he loved it! He had an open door policy---any student could come by any time. He would make appointments for Saturday night if that's what they needed. Then came his election as ACS President-Elect. So far as what he hoped to accomplish as ACS President, Tom noted first of

all you have start planning immediately in your year as President-Elect. His intentions at this time are to arrange a symposium on fracking at the San Francisco ACS Meeting. It is a controversial issue whether it deserves to be or not, and chemistry is right in the middle of it. He will try to have a balanced group of presenters, and he wants this symposium to be open to the general public, not to just ACS members attending the meeting. He also wants to arrange a symposium on photocatalytic conversion of water to hydrogen and oxygen. This process would/could be the ultimate solution to the world's energy needs. He is not sure whether this symposium would be held in Dallas or in San Francisco.

Another project is to hold a summit meeting of CEOs of American chemical companies. This summit would not be held at an ACS meeting. The idea would be to come up with a list of the obstacles getting in the way of the flourishing of the American chemical industry in the US. Tom would rule out discussion of things that one can't do anything about, for example, labor costs. He hopes to have co-sponsorship of the summit by other societies. Tom guesses that some of the obstacles may be regulatory in nature. The ultimate goal would be to come up with things that ACS could do to facilitate this flourishing, while staying within the bounds of the ACS charter. One other benefit might be more industrial involvement in ACS.

Tom also plans to be an advocate for improved K-12 science education. What are the barriers that keep American from ranking No. 1 in science education? He wants ACS to be out there saying this situation has to change. Regarding testing, Tom believes that "teaching to the test" is the road to rote memorization. This is the wrong direction if we want to train people to be innovators. Instead we need to teach thinking. He says that ACS has many excellent teaching programs directed toward middle school, high school, and undergraduate education.

Tom noted that many people had asked him what he was going to have a task force on. His reply is "Nothing!" Task forces take a tremendous amount of staff time, often to no purpose. You need something that deserves that effort. K-12 education does, but every decade has seen a report in this area. It's not a question that we don't know where the problems are. We do. You either do something about it, or you don't!

This April 8 interview was my tenth interview of an ACS president, and I am always struck by how bright and articulate these individuals are. Of course, wasn't that the basis for which we elected them? I was impressed by Tom Barton's focusing on a limited number of areas, but areas of high impact and visibility. I look forward to his accomplishments in his presidential year.

ACS President-Elect Thomas J. Barton (from left), ACS President Marinda Li Wu, and ACS Immediate Past-President Bassam Z. Shakhashiri .

From the ACS Press Room

First scientific method to authenticate world's costliest coffee

Selection of Discriminant Markers for Authentication of Asian Palm Civet Coffee (Kopi Luwak): A Metabolomics Approach

Journal of Agricultural and Food Chemistry

The world's most expensive coffee can cost $80 a cup, and scientists now are reporting development of the first way to verify authenticity of this crème de la crème, the beans of which come from the feces of a Southeast Asian animal called a palm civet. Their study appears in ACS' ***Journal of Agricultural and Food Chemistry***

Eiichiro Fukusaki and colleagues point out that Kopi Luwak (Indonesian for "civet coffee") is the world's costliest coffee, often fetching $150-$200 per pound. Palm civets eat coffee berries, digest the soft fruit surrounding the bean and excrete the bean. Workers retrieve the coffee beans and clean, ferment and roast them. The price makes Kopi Luwak a tempting target for fraud, with ordinary coffee sold as Kopi Luwak or real Kopi Luwak adulterated with cheap beans. Fukusaki and his team decided to find a way to scientifically identify the real deal.

They describe identifying unique chemical fingerprints that can be used to identify authentic Kopi Luwak and distinguish pure Kopi Luwak from Kopi Luwak that has been mixed with cheaper coffee. "This is the first report to address the selection and successful validation of discriminant markers for the authentication of Kopi Luwak," the scientists state.

Editor's note:

The civet cat is also called a toddy cat: The name comes from the civet's fondness for palm flower sap, which can be fermented into a liquor used in toddies. Actually, the civet cat is not a feline at all but is related to mongooses and weasels (and yes, it really is mongooses, not mongeese).

Video of civet cat

FIVE QUESTIONS FOR...

Our September '5 Questions' participant is **Katie Walker**, Visiting Assistant Professor of Chemistry at Austin College and Current Chair -Elect of the ACS DFW local section. Dr. Walker holds a Ph.D. in Analytical Chemistry and a B.S. in Biochemistry & Molecular Biology, and is an active ACS volunteer. Dr. Walker has served as Founding YCC Chair, Central Texas section (2011-2012), Undergraduate Programming Co-Chair for the 2011 SWRM (2010-2011), and as the President (2006-2007) and Secretary (2004-2006) of the UTD Student Chapter.

1) How old were you when you realized you wanted to be a scientist?
I went to a small school, so I was involved in lots of different academic and extracurricular pursuits. I don't think I ever really thought about science in terms of "career" until applying for college. However, I know I was highly interested in my science classes and performing experiments from 6th grade all the way through high school.

2) What aspects of chemistry do you enjoy the most?
Originally, I fell in love with chemistry as an undergraduate while participating in outreach activities with the ACS student chapter at UTD. As I got to my upper level classes and research experiences, I got very excited about analytical chemistry—designing a great experiment, troubleshooting, and working with instruments. Those are still my favorite parts of chemistry!

3) You've worked in a number of scientific areas, including building instruments. Is there a class or training that was most useful to you - or that you wish you'd taken? and if so, which was it?
With my varied education, I've taken a lot of classes and they've all been useful in different ways. Overall, the most useful training has just been getting into a lab and getting my hands dirty with research. Even things that sound difficult or intimidating become just another problem to troubleshoot and figure out, once I get into lab and working on it.

4) If you could change anything about the process of pursuing a career in the sciences, what would it be?
I think a lot of graduate students don't get the training they need to seek non-academic careers. A study in which I was involved UT showed that there was a huge disconnect between what faculty thought they were training students for (academic positions) and what students wanted to pursue (mostly industry). I know there are several efforts within and outside the ACS working on addressing this issue.

5) Who is your Science Hero? and why?
Tough question! I actually like television shows that promote scientists and engineers as a great way to get people interested in science: Stargate, Star Trek, Big Bang Theory, etc. Making science cool for the next generation!

Thank you, Dr. Walker, for participating in Five Questions!
To volunteer to be interviewed, email to retort@acsdfw.org.

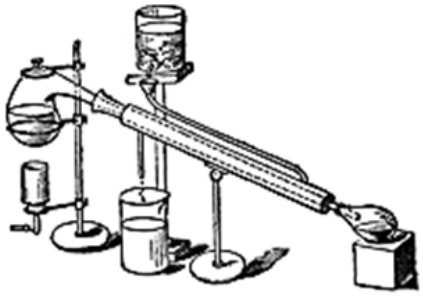
From the editor

Welcome back to the RETORT; I hope everyone had a good summer. This month we have a packed issue:

- The annual interview with the ACS President-Elect, Tom Barton. A regular feature contributed by Tom Strom, this is his tenth interview with an ACS president.
- Fracking and environmental concerns, from John Spessard
- Doherty and Schulz Award winners
- SWRM 2013 coming up in Waco
- Letter from the DFW Chair-Elect, Katie Walker, with the dates and places of the fall meetings

And more: it's a packed issue.

If you've read the RETORT on a regular basis since we went online, by now you know that I am incurably attracted to the frivolous and peculiar, even in chemistry… particularly in chemistry! For me, a highlight of this month's issue is the *JAgFoodChem* article **Markers for Authentication of Asian Palm Civet Coffee (Kopi Luwak)**. ***Kopi*** is the Indonesian word for coffee, along with **l*uwak***, the local name of this animal. Coffee beans ***predigested*** (yes, eaten and excreted) by the Asian palm civet cat (not really a cat) are the source of the world's most expensive coffee, Kopi Luwak. Up until now, no one could tell the difference between the real thing and *faux*-Kopi Luwak. Is that important?—well, when you consider that the real stuff, the cat's—uh—meow (100% Kopi Luwak) sells for almost $200 a pound, it gets important (even 2% K-L sells for $50 a pound). What I want to know: how much does the palm civet cat get paid? Do they get a cut of the take?



Best regards,
Connie