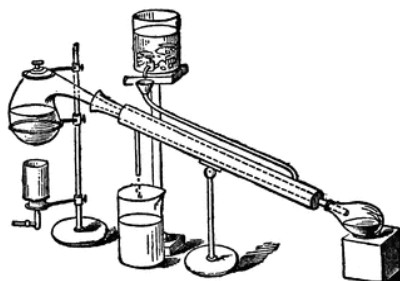




# ***SOUTHWEST RETORT***



**SIXTY-FIFTH YEAR**

**OCTOBER 2012**

*Published for the advancement of  
Chemists, Chemical Engineers  
and Chemistry in this area*

published by

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### Positions available:



PhD Researcher at UNT Health Science Center on Alzheimer's disease. Details at the following link:

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## *FIFTY YEARS AGO IN THE SOUTHWEST RETORT*

### *OCTOBER 1962*

The ACS Southwest Regional Meeting to take place in Dallas Dec. 6-8 is already assured of being the biggest Southwest Regional Meeting ever. The number of papers is already over the 200 mark. There are a large number of well-known speakers scheduled. Here is a list of just a few of them: **Paul Flory**, Stanford; **H. C. Brown**, Purdue; **Frank Bovey**, 3M; **George Hammond**, Cal Tech; **R. W. Taft**, Penn State; **Michael Szwarc**, Syracuse; **Charles Overberger**, Brooklyn Polytechnic; **R. B. Turner**, Rice; **John R. Van Wazer**, Monsanto; **Sean P. McGlynn**, LSU; **Kenneth Pitzer**, Rice; **J. A. Weill**, Argonne; **E. S. Amis**, Arkansas; **W. A. Watson, Jr.**, TCU; **Philip West**, LSU; **Clayton Callis**, Monsanto; and **Norman Hackerman**, UT-Austin. There will be tours at the meeting. One will be of the Socony-Mobil Field Research Laboratory, and the other will be of the Texas Instruments Semi-Conductor Plant.

The October ACS tour speakers will be **Dr. F. Marott Sinex** of the Boston University School of Medicine speaking on "The Biochemistry of Aging" and **Dr. William O. Stratton** of DuPont speaking on one of three topics, "New Concepts of Polymer Morphology," "Order and Motion in Polymers," or "Segment Mobility in Fibers as Shown by High Temperature NMR."

At TCU **Dr. William H. Watson** received a renewal of his research grant from Texas

Instruments. **Dr. E. R. Alexander** attended an NSF conference held at Montana State University. **Dr. J. E. Hodgkins** attended an API conference held at the University of Wyoming. **Dr. R. K. McLeod** joined the TCU faculty as assistant professor of physical chemistry.

The University of Arkansas was represented at the ACS National Meeting by **Drs. E. S. Amis, A. Fry, and S. Siegel**. The speaker at the Oct. 5 ACS section meeting will be an Arkansas alum, **Dr. Wayne L. Carrick** of Union Carbide Corp. in Bound Brook, NJ. Dr. Carrick did his Ph.D. research under **Dr. Arthur Fry**. Dr. Carrick's talk will be on "The Mechanism of Olefin Polymerization by Ziegler-Type Catalysts."

At Baylor, **Drs. Thomas C. Franklin and Leone Cockerell** attended the Atlantic City ACS meeting. **Dr. A. G. Pinkus** attended a symposium on molecular rearrangements held at McMaster University, Hamilton, Ontario, Canada. The Humble Oil laboratory at Baytown donated some surplus equipment to the department. This included two older model infrared spectrometers and two automatic recording Podbielniak fractional distillation apparatus.

*CONTRIBUTED BY  
E. THOMAS STROM*



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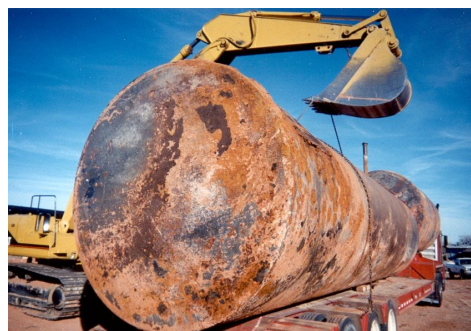


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## LEAKING UNDERGROUND STORAGE TANKS

By John Spessard

The EPA estimates there are about 596,000 federally regulated active underground storage tanks (USTs) at about 212,000 sites in the 50 states and reservations. Most USTs hold petroleum hydrocarbons such as gasoline, diesel fuel, jet fuel and petroleum base solvents. USTs were originally made of



mild steel. In time, the steel has corroded resulting in leaking tanks. Leaking hydrocarbons of particular concern are benzene, toluene, ethyl benzene and xylenes.

Gasoline is about 0.76% benzene by weight. A ten gallon gasoline spill contains enough benzene to contaminate 46 million liters or 12 million gallons of water. Such a leak can't be detected by the inventory control measures used by UST owners and users. The EPA mandated that gasoline needed oxygenated hydrocarbons to reduce air pollution. The original choice was methyl tertiary butyl ether, or MTBE. Oil refineries were required to add MTBE to gasoline. MTBE showed up in ground water and drinking water supplies. The EPA then outlawed the use of MTBE in gasoline and required that ethanol be used instead. Modern USTs can be (1) a steel or aluminum tank with an fiberglass or plastic outer liner with an interstitial space to catch leaks or spills, (2) a fiber reinforced or carbon

fiber tank or (3) a double walled steel tank with an interstitial space to catch leaks. A steel tank will have cathodic protection. The tank is electrically connected to an active metal such as a zinc bar so that the zinc corrodes preferentially. (That is the principle behind galvanized or zinc-coated steel.) Leak detectors have been developed that can detect leaks as small as 0.1 gallons per hour. Periodic leak testing of USTs is required. Cathodic protection systems are required to be leak tested every three years.

I had a professor who was doing research using a glass tubing high vacuum system. He referred to a stopcock as being "a located leak." Similarly, the necessary connections between the tank and the user are sources of leaks. First, there is the connection between the tank and the dispensing pump (two connections). Then there is the connection between the pump and the flow meter (two more connections). Then there is the connection between the flow meter and the user (one more connection). Leak control must deal with potential losses from each of these points. This may be more of a problem than a tank leak or failure.

All of you have seen service stations being closed and the tanks removed. There is often a deed restriction banning the reuse of the property from ever storing or dispensing hydrocarbons. This is because, if so used, the new users could generate spills or leaks and generate legal and economic liabilities for the original property owner.

## ...AND ANOTHER THING...

By Denise L. Merkle

### INATTENTIVE

In April 2006, the U.S. Department of Transportation National Highway Traffic Safety Administration (NHTSA) released the fascinating document, "The Impact of Driver Inattention On Near-Crash/Crash Risk: An Analysis Using the 100-Car Naturalistic Driving Study Data" (DOT HS 810 594)\*. Fascinating. Truly. The report is compelling. While it is just possible that one might argue the need to be seriously nerdy to enjoy reading an entire 200+ page study, one does not have to be very inquisitive to understand the conclusions drawn from the collected data: Driver inattention (except < 2 second 'eyeglances' to assess environment) significantly contributes to automobile accidents and near-misses.

Drowsy drivers were involved in the most encounters, being 4-6 times more likely than alert drivers to have a problem. Drivers distracted by complex tasks such as reaching for a moving object, dialing the phone, putting on make-up, etc., were three times as likely to crash or to swerve to avoid a crash.

These were not computer-modeled situations, nor were the data gleaned from police reports of past accidents. In the study, 100 cars were outfitted with computers designed to gather input from in-vehicle accelerometers, Doppler radar devices and cameras recorded very nearly every aspect

of the car and driver. Even the drivers' faces were monitored. (It was amusing to note that only 99 cars finished the study, and that at least one driver was removed from assessment after having too many wrecks in the leased test car.)

Drowsy driving\*\* caused the most crashes/near crashes in every observed road, traffic and driver condition, with the exception of a situation or two in which data were statistically insufficient; surprisingly, drowsy driving in daylight caused a high percentage of incidents. Dialing the phone didn't help either, nor did fishing around in the back seat for objects that rolled back and forth under braking.

What is the point of all this, you ask? Amazingly enough, the point is to pay attention to what you're doing. Be willing to pull over if your eyes keep closing. Stop staring at that billboard (no one else can tell what the picture is supposed to be, either). Don't make phone calls just because your only free time is in the car. Better yet, don't mess with the phone at all, especially when you're supposed to be doing something else - such as talking to the person who's actually there with you. Trust me. That free time you're using to drive isn't actually free. And you can't fully discover that...until the statistics include *you*.

*Continued on next page*

## *And Another Thing...cont.*

\*Klauer, S.G., Dingus, T. A., Neale, V. L., Sudweeks, J.D., and Ramsey, D.J. (2006). *Impact of Driver Inattention On Near-Crash/Crash Risk: An Analysis Using the 100-Car Naturalistic Driving Study Data (DOT HS 810 594)*; [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov), available to the public via National Technical Information Service, Springfield, VA 22161.

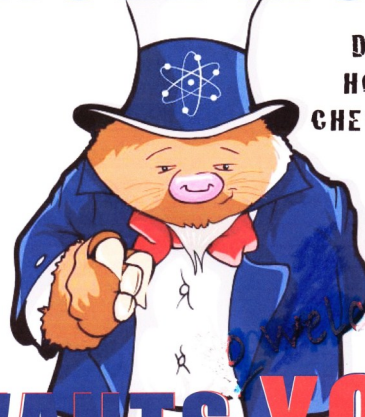
\*\*Y. Ian Noy (Ed.) (1997). *Ergonomics and Safety of Intelligent Driver Interfaces (Human Factors in Transportation)*, Chapter 21, *Monitoring Driver Fatigue*. CRC press.

\*\*FHA TechBrief (1998). *PERCLOS: Valid Psychophysiological Measure of Alertness As Assessed by Psychomotor Vigilance*, <http://www.fmcsa.dot.gov/documents/tb98-006.pdf>

*And Another Thing...is meant to inspire thought and discourse. In no way is it intended to criticize the efforts of those who devote their time and energy to improve others' opportunities.*

**If you send a news item or contribution to the *RETORT* and do not receive an acknowledgement, we didn't get it! This sometimes happens, with attachments and with simple messages. In such case, just send it again.**

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# Date palm juice: A potential new “green” anti-corrosion agent for aerospace industry

**Anti-Corrosive Properties of Date Palm (*Phoenix dactylifera* L.) Fruit Juice on 7075 Type Aluminium Alloy in 3.5% NaCl Solution, Husnu Gerengi, *Industrial & Engineering Chemistry Research*, in press**

The search for a “greener” way to prevent corrosion on the kind of aluminum used in jetliners, cars and other products has led scientists to an unlikely source, according to a report in the ACS journal *Industrial & Engineering Chemistry Research*. It’s the juice of the date palm — those tall, majestic trees that, until now, were noted mainly as sources of food and traditional medicines.



Husnu Gerengi points out that strong, lightweight aluminum alloys are used to make planes, cars and industrial equipment.

Aluminum corrodes when exposed to air, but unlike rusting steel, the corrosion of aluminum’s surface layer forms a protective film that prevents degradation of the underlying metal. However, that film breaks down in some harsh environments, like seawater, leaving the metal vulnerable. Engineers have developed coatings to protect aluminum in these applications, but

many of these use potentially toxic chemicals. Previous research suggested that extracts of date palm leaves had an anti-corrosion effect. Gerengi decided to check date palm juice.

He found that date palm juice inhibited corrosion of an aluminum alloy called AA7075, used in aerospace and other applications, in a salt solution.

Gerengi noted that while an extract from date palm



leaves is a known anticorrosive, this was the first test of the fruit’s juice. The juice, which he reported adsorbed into the aluminum’s surface, contains a number of sugars. Gerengi posited that these react with aluminum to form an anticorrosive film on the metal’s surface.

*[Editor’s note: there is a good discussion of aluminum corrosion and aluminum grades at [www.keytometals.com/Article14.htm](http://www.keytometals.com/Article14.htm)]*



## *Around-the-Area*

### *Heart O' Texas*

Baylor has hired Dr. Kevin Shuford (formerly of Drexel University) as an



**Kevin Shuford**

Assistant Professor of Physical Chemistry. Dr. Shuford has an impressive pedigree in theoretical chemistry, having gotten his PhD with Jeffrey Krause at Florida, postdoctoral research with George

Schatz and Mark Ratner at Northwestern, and a subsequent research staff position at Oak Ridge National Labs. Dr. Shuford's research encompasses a range of important problems that include modeling and simulation of atomic, molecular, and optical properties of bulk and nano-structured materials with an emphasis on structure, dynamics, and fundamental studies of light/matter interactions.

### ***SWRM 2013***

**The Heart O' Texas section will be hosting the 2013 Southwest Regional ACS meeting. Organizing of symposia will begin soon, under the direction of Dr. Bob Kane of Baylor University's Chemistry Department (Bob\_Kane@baylor.edu).**

*Details on page 14*

### ***DFW to host SWRM 2014***

**Volunteers Needed!** As many of you know, the Dallas-Fort Worth Local Section will host the 2014 Southwest Regional Meeting (SWRM 2014). Local sections within the Region typically host SWRM every 10 years. SWRM 2004 was quite successful, and we look forward to maintaining the same high standard.

Volunteers will form the backbone of success for SWRM 2014. We are in the planning stages for SWRM 2014, and we need volunteers to serve in a variety of capacities. We are looking for volunteers related to PR, funding, exhibits, as well as program chair. If you would like to organize a symposium or event, that would be great. No effort is too small to make a big contribution.

If you would like to be involved in any way in SWRM 2014, please contact me as soon as possible at [swrm@acsdfw.org](mailto:swrm@acsdfw.org). More details about the planning meeting will be circulated via email soon.

Participating in a SWRM is a unique and rewarding experience, and I encourage you all to consider how you can play a part! **Kirby B. Drake, General Chair SWRM 2014**

## UTA

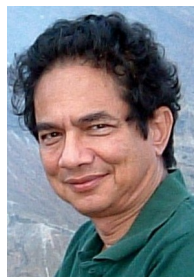


Dr. **Zoltan Schelly** chaired a session at the 13<sup>th</sup> International Symposium on Colloidal and Molecular Electrooptics (ELOPTO-2012), Sept. 2-5 in Ghent,

Belgium, where he presented a talk on “Transient Electro-Optics of Soft Matter”. At the conference he was awarded the **2012 Kerr Medal**. In the 38 year history of the ELOPTO conference series, the Kerr Medal has been award to only eight scientists, with Zoltan being the eighth. Subsequently, he gave the same lecture in the physics department of Johannes Gutenberg University in Mainz, Germany. Ed.’s note: For more information about the Kerr Medal, look at

<http://elopto2012.elis.ugent.be/kerr.php>

### Late-breaking news!



**Sandy Dasgupta** of UTA is the 2012 recipient of the ACS Southwest Regional Award. See the article about Sandy in the September **RETORT**.

### Texas Tech

One innovative thing that is being tried at Texas Tech is a partnership with the Theatre department to train new grad students in instructional lab safety. The program was run on a recent Saturday as a day-long workshop in which the students

first performed exercises to develop awareness of body positions and movement and use of voice. The afternoon sessions involved actors portraying various safety incidents (violations/accidents) in the laboratory with grad students practicing how to respond to them. For more information see <http://today.ttu.edu/2012/09/art-of-science-chemistry-theatre-join-forces-to-keep-undergrad-labs-safe/>.

### Tarleton State University

Tarleton State University in Stephenville is proud to announce the addition of two new chemistry faculty: Dr. **Rajani Srinivasan** and Dr. **Bernat Martinez-Ortega**. Dr. Srinivasan received her PhD in Environmental Chemistry and comes to us from the Texas A&M Blackland Research and Extension Center in Temple, TX. Dr. Martinez received his PhD in Inorganic Chemistry at Texas Christian University.

Two other notable changes have also occurred at Tarleton. Dr. **Arthur Low** is now Department Head, and Dr. **Rueben Walter** has formally retired after 35 years of service.

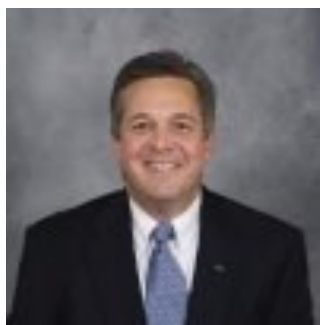
TSU enrollment numbers officially topped 10,000 this fall, and the number of chemistry majors is also at an all time high. The Student Affiliate Chapter recently received notification of a Commendable rating for last year’s activities.

# DFW Section Meeting

OCTOBER 17, 2012

**Terry J. Dagnon**  
**Alcon Laboratories**

## Regulatory Aspects of Pharmaceutical Development



Terry J. Dagnon joined Alcon in 1999 as a Manager of Alcon Regulatory Affairs and is currently a Senior Director of Regulatory Affairs. Terry has worked primarily on global pharmaceutical regulatory affairs during this time, but also previously had responsibility for Alcon's back-of-the-eye products, retina pharmaceuticals, the vitreoretinal surgical products and the ICaps product line. Prior to joining Alcon, Terry worked for Johnson & Johnson Medical and had global regulatory responsibility for the wound care, skin care, and tissue engineering franchises. Prior to Johnson & Johnson Medical, Terry was the Head of Regulatory Affairs at Physician Reliance Network Research, Inc. (now known as U.S. Oncology) and also served eleven years on active duty in the United States Army. Terry has an undergraduate degree from Wayland Baptist University with a degree in Healthcare Administration and a Masters of Science in Regulatory Affairs from San Diego State University.

### **Reservation Information:**

**Building: Lou's Place, 1112 Wesleyan Street, Texas Wesleyan University**

**Deadline for reservations: October 10**

For RSVPs, access the link below:

<https://docs.google.com/a/utexas.edu/spreadsheet/viewform?formkey=dHVBM2hSY19wODdWeVp6b1dpQ1hFRHc6MQ>

For further information contact Katie Walker at [ewalker@txwes.edu](mailto:ewalker@txwes.edu) or (817) 531-4864

# DFW Section Meeting NOVEMBER 5, 2012

## Schulz Award Lecture Todd Abronowitz

### *Using movies to teach the global learner*

Todd Abronowitz earned his BS in Mathematics and History from Eastern Michigan University and a MS in Chemistry from Texas A&M University-Commerce. “Mr. A” has taught high school chemistry at seven schools in the Dallas-Fort Worth area, including serving as the lead AP Chemistry teacher for Dallas ISD, and currently teaches at Parish Episcopal School in Dallas. He has taught AP Chemistry since 1993 and has been a College Board consultant for AP and Pre-AP Chemistry since 2003. He has received numerous local, state and national awards for his teaching, including the 2000 Texas Chemistry Teacher of the Year, 2003 Radio Shack National Teacher Award Winner, and the 2012 National Math and Science Initiative All-American Teacher of the Year. He has taught in numerous settings in the States of Michigan and Texas: rural, suburban and urban public school districts and parochial schools. He has also taught at the college level, most recently for Rice.



### **The Large Group Meeting Room, Parish Episcopal School 4101 Sigma Road, Dallas, TX 75244**

**Reception:** 6:00-6:30pm      **Dinner:** 6:30-7:30pm      **Lecture:** 7:30-8:30pm  
**Menu:** Mixed Greens salad with choice of dressing, Chicken Piccata with fresh basil lemon butter sauce, steamed broccoli, scalloped potatoes, New York cheesecake with strawberry sauce, Tea/Spa Water/Coffee

**Dinner Cost:** \$25 (Payment by cash or check made out to PARISH EPISCOPAL SCHOOL will be accepted at the door. Please note that registrants are financially responsible for reservations made but not used. It is not necessary to attend the dinner in order to attend the lecture.)

**RSVP for Dinner and/or Lecture by Tuesday October 30<sup>th</sup>**

to Molly Folse: [mfolse@parishepiscopal.org](mailto:mfolse@parishepiscopal.org) 972-239-8011 ext. 2305

# 69<sup>th</sup> SWRM November 17-20 2013 Waco Texas



## Special Symposia and Workshops

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Pharmaceuticals in the Environment  
The Gooch-Stephens Lectures  
Spectroscopy, Dynamics, and Kinetics  
Synthesis and Synthetic Methodology  
The Stone Symposium  
Emerging Structural Analyses in X-omics  
Organometallic Chemistry and Catalysis  
Instrumentation Workshops  
Nanoparticle Optics and Sensing  
*And many more...*

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Kevin\_Chambliss@baylor.edu

General Chair:  
Bob\_Kane@baylor.edu

Host Hotel:  
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## *All roads lead to Waco!*

## FIVE QUESTIONS FOR...

Featured this month is **Todd Abronowitz**, Chemistry Teacher (and self-proclaimed **Mad Chemist**) at Parish Episcopal School, and the 2012 Recipient of the Werner T. Schulz Award for Excellence in High School Chemistry Teaching. *Attend the ACSDFW Local Section's Schulz Award dinner in November (see page 13) to hear Mr. Abronowitz speak on his career, and award-winning teaching methods.*

### 1) How old were you when you realized you wanted to focus on chemistry?

I was in high school. I had a very good high school chemistry teacher in Michigan. I left half-way through the chemistry-I class to study in Australia for a year, and just that half year provided a solid foundation for success in the chemistry that I took in Australia (although not the British pronunciation of Al-u-min-IUM). I returned in December and jumped into AP Chemistry.

### 2) What event first triggered your interest in science?

I have always liked math, and chemistry is nothing but applied math. My high school in Michigan only had one AP class and that



was chemistry, so I guess that is where my love of chemistry comes from...either that, or I can blow things up and

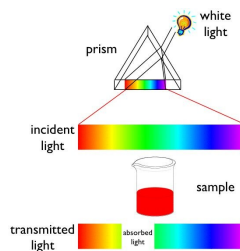
call it educational.

### 3) Do you have a pet peeve about teaching High School chemistry? And can you share it with the readers of the RETORT?

I really have two pet peeves and certainly can share them...it will be nothing new to teachers. I dislike it when students complain about the amount of work, and when you give them time to work in class, they clean up early and don't use their time productively. The second pet peeve is when students leave things blank on a test and will not even try on a problem.

### 4) There are approximately 1600 ACS members in the DFW local section. What can we do to assist teachers as they educate the scientists of the future?

Specifically on the new AP chemistry curriculum, Beer-Lambert Law and spectroscopy (mass, photoelectron, vibrational, IR) are listed several times, and it is something in which many AP chemistry teachers may not have a solid background. Invite their



class to your lab to see the equipment and get an idea of how it is used. If the school has an analytical balance

or a Spec-20, offer to service it (repairing equipment is something that is not taught to teachers in their academic preparation, unless they have a background in industry).

*Continued on next page*

## 5 Questions cont.

### 5) Who is your Science Hero and why?



I don't think I really have a science hero. I haven't given it much thought...if I am pressed for an answer, I would have to say Albert Ghiorso – who helped to discover 12 different elements, and almost no one knows who he is.

**Ed.'s note:** Listed below are the elements with which Albert Ghiorso is credited with co-discovering. There is a great article on Wikipedia about his life and accomplishments:

[http://en.wikipedia.org/wiki/Albert\\_Ghiorso](http://en.wikipedia.org/wiki/Albert_Ghiorso)

Americium ca. 1945 (element 95)  
Curium in 1944 (element 96)  
Berkelium in 1949 (element 97)  
Californium in 1950 (element 98)  
Einsteinium in 1952 (element 99)  
Fermium in 1953 (element 100)  
Mendelevium in 1955 (element 101)  
Nobelium in 1958–59 (element 102)  
Lawrencium in 1961 (element 103)  
Rutherfordium in 1969 (element 104)  
Dubnium in 1970 (element 105)  
Seaborgium in 1974 (element 106)

***Thank you, Mr. Abronowitz, for participating in this month's '5 Questions'!***

## Attention Chemistry Clubs and Student Affiliates

# CONTEST!

The DFW Section needs a logo and a slogan of its own, so the section is sponsoring ...with prizes!...a contest for each.

Submit entries to

[retort@acsdfw.org](mailto:retort@acsdfw.org)

as pdf or jpeg for logo and word format for the slogan.

**\$100 prize for each !**

Deadline November 1

Winners will be announced in the November **RETORT**.

### NOTE:

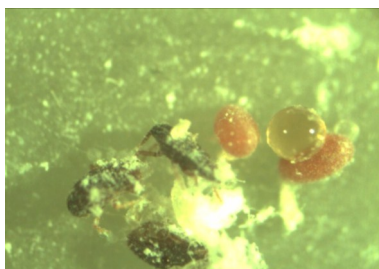
May not incorporate or resemble any part of the national logo or slogan.





## *From the editor...*

When I began as editor of the **RETORT** last year, I used articles from the ACS Press Room because we needed some interesting filler. (The printed edition had cost-limited space, so there was always more than enough!) Now, the filler isn't needed, but the articles in the Press Room—at least the ones I choose—are a bit unexpected. For example, the use of date palm juice to prevent corrosion of aluminum...? How did that come about? Date palm leaves and extracts of the leaves have been used in the past as corrosion preventatives. So what about date palm fruit juice? The author feels that the sugars in the juices, which are adsorbed on the surface, react with the aluminum and form a corrosion shield. If, by any chance, you want to know more about date farming, here is a great link to [Fruitipedia.com](http://www.fruitipedia.com), an encyclopedia of edible fruits of the world (a total of 445 so far): <http://www.fruitipedia.com/Date%20Palm.htm>. At LSU, huge date palms grew in front of old Coates Hall, then the chemistry building. Every summer, huge clusters of dates would ripen and fall to the ground. If only we had known...



It just goes to show you—you never know where your next research product or idea might crop up. For example, three years ago, I looked at some moldy-looking fluff on dying prickly pear and wondered “Is the pear dying because of the mold, or is the mold taking advantage of a dying plant?” Turns out it was a tiny insect (**very** tiny insect, which does kill the plant) called the cochineal bug, whose blood is the source of the red dye in British redcoats and the pink in the adobe of Santa Fe. The “mold” is wax strands which hold the insects to surfaces and protect them from rain and ants. As a natural product, cochineal—also called carmine, crimson lake, or Natural Red 4—is in great demand for food and cosmetics coloration. Long story short, Denise Merkle (my business partner) and I have developed a method which allows the bugs to grow in a protected culture environment, independent of geographical and weather conditions. If you noticed the kerfuffle earlier this year with Starbucks about the use of this dye, please note that cochineal is an extracted certified dye, **not** just crushed bugs! (If you want to know more about it, look at [cochineal](#)).

Best regards,

