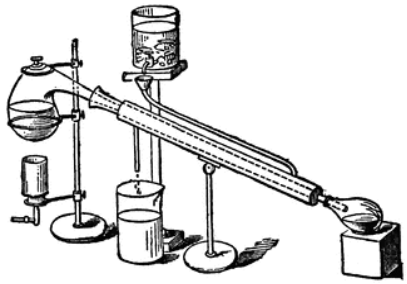
SOUTHWEST RETORT



SEVENTY-FIRST YEAR **JANUARY 2019**

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

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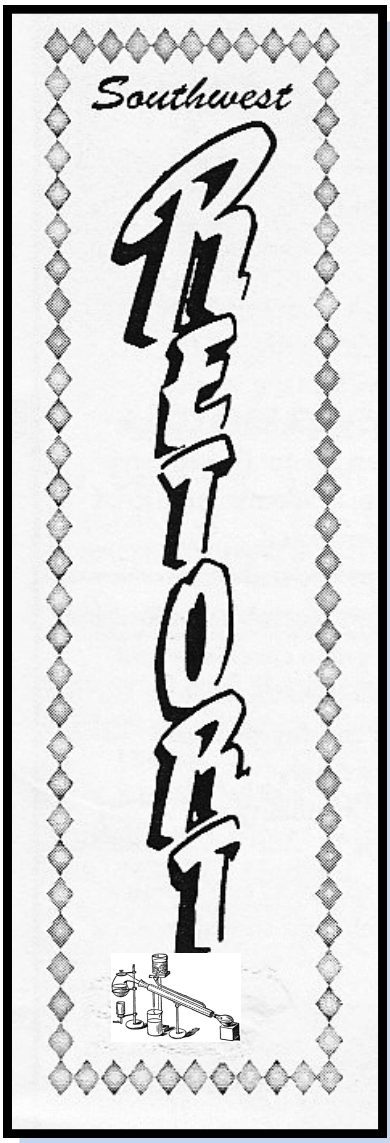

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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The lead article in this issue was "The Cyclobutadiene Problem," written by Dr. Rowland Petit of UT-Austin and taken from his last month's address, when he was given the 1968 Southwest Regional Award at the ACS Southwest Regional Meeting held in Austin.

The ACS Central Section reports that the Southwest Regional meeting was indeed a success. The total attendance was just short of 1000 (979). Two hundred twenty people attended the banquet to hear a most entertaining lecture by Sir Gilbert Peake. The plant tours and ladies program were well attended; the technical sessions were well received; and there were more requests for exhibit space than could be accommodated. Our thanks must go to the principals of the meeting: Dr. Donald Carlton, Dr. Joe Lagowski, Mr. Carl Locke, Dr. Stanley Cavitt, Dr. Robert Soulen, and Dr. P. E. Cassidy, as well as the many other chemists and chemical engineers who worked quietly behind the scenes.

The Texas A&M-Baylor ACS local section is no more, being replaced by the individual Texas A&M Section and the Heart O'Texas Section, focused around Baylor in Waco. The Charter Presentation Meeting for the new section took place on Dec. 3 at the Alico Inn. About 65-70 members attended the meeting. The offices for the new section were installed. They are: Chair, Thomas C. Franklin, Baylor; Chair-Elect, Raymond McCrory, James Connally Technical Institute; Secretary-Treasurer, Mrs. M. J. Ross, Connally High School; Councilor, James L. McAtee, Jr., Baylor; and Alternate Councilor, C. H. Herty, III, Rocketdyne.

In the area of the Dallas-Ft. Worth ACS Section, Dr. Lyman R. Caswell has been appointed Chair of the Chemistry Department at Texas Woman's University. He had served as Acting Chair for one year. The Dallas Society of Analytical Chemists chose the following new officers: Chief Analyst, C. T. Kenner; Assistant Chief Analyst, Ray Burson, Recording Analyst, Bill Freudiger; and Statistical Analyst, Carl Moore. At TCU Dr. H. C. Kelly gave seminars at SMU, Texas Lutheran College, and Trinity University. Dr. Bill Smith attended the carbonium ion conference held in Cleveland, OH. At the Southwest Center for Advanced Studies (now UT-Dallas) Dr. David Creed is beginning a post-doctoral study with Dr. Harold Werbin on the photochemistry of electron transport quinones.

In the South Plains ACS Section, groundbreaking ceremonies were held for a new $5.5 million addition to the Texas Tech chemistry building. Dr. Henry Shine recently had his Welch grant renewed. Among the recent speakers at Texas Tech was Dr. Roald Hoffmann of Cornell, who gave two lectures.

contributed by
E. Thomas Strom

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Dallas-Fort Worth

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And Another Thing...

Maybe Not Another Thing

By Denise L. Merkle, PhD

Happy New Year! Here we are, again, at the start of another year. There's already more sunshine in the day, which is a boon for beach babies, mountain hikers, and everyone in between. This year finds the columnist - aka me- beginning my 3rd stint as Chair of the DFW local section. This time I'm not also participating on the planning committee of an ACSDFW-hosted Regional Meeting, which will be a unique experience. (I'm all for volunteering in any way you can, however, if someone offers you the opportunity of simultaneously being Section Chair and Regional Meeting Chair, say No).

As Local Section Chair, I have the privilege of planning local section meetings for the remainder of the 2018-2019 school year. As always, the Chair-elect, when we locate a volunteer for that position, will take over planning in the fall. Chairs and Past-Chairs will be available to assist Chairs-elect, if they're new to that kind of thing. It's not a Jump In At The Deep End kind of thing.

Welcome to the Newly Elected Officers of the DFW Local Section, and many thanks to those who rolled off the Executive Committee (ExCom). There's a list of all ExCom members elsewhere in the Retort. New or Re-elected in 2019 are: Treasurer, Martha Gilchrist of TCCD; Councilors Tom Strom of UTA and Jason McAfee of UNT; and Alternate Councilors John McIlroy of the South Central Laboratory of the DEA and Michael Bigwood of Polymer Phases. Many thanks to all for your newly undertaken or continuing service to chemistry.

If you'd like to assist ACSDFW to promote chemists and chemistry, a good way to make a lasting impact is to be on the Awards committee. This committee is a little-known but important function of the Local Section. It's a 5-year commitment but is not a full-year effort. Each year, Awards Committee members assess Nominations and select the Schulz, Doherty and Ambassador recipients. In their 5th and last year on the committee, members are Chair thereof. Power! Let us know if you'd like to contribute to your colleagues' advancement by serving on the Awards Committee.

If it seems like 'And Another Thing...' has become a propaganda tool for the Local Section, you may be right. Especially with moving from Chair-Elect to Chair, volunteerism is on my mind. Current events suggest a significant need for support and awareness of science in the USA - who better to advance Chemistry than Chemists? There are lots of ways to be involved, if you want to be - and no one will think poorly of those who choose not to leap into action. Whatever floats your boat.

From the ACS Press Room

Rabbit gene helps houseplant detoxify indoor air

Greatly Enhanced Removal of Volatile Organic Carcinogens by a Genetically Modified Houseplant, Pothos Ivy (Epipremnum aureum) Expressing the Mammalian Cytochrome P450 2e1 Gene

Environmental Science & Technology

Our homes are supposed to be safe havens from the outside world. However, studies have shown that household air is more polluted than either office or school air, exposing children and home workers to higher levels of carcinogens than the general population. Now, researchers have made a genetically modified houseplant that can efficiently remove at least two toxins from the air. They report their results in ACS' journal Environmental Science & Technology.

Indoor air often contains volatile organic compounds such as formaldehyde, benzene and chloroform. These toxins come from many sources, including cooking, showering, furniture and smoking. House plants can remove some toxins from the air, but they aren't very efficient: A homeowner would need more than 20 plants to remove formaldehyde from a typical room, researchers estimate. Stuart Strand and colleagues wondered if introducing a mammalian gene called CYP2E1 to a common houseplant, pothos ivy (Epipremnum aureum), would boost the plant's detoxifying potential. This gene encodes cytochrome P450 2E1, an enzyme that breaks down a wide range of volatile organic compounds found in the home.

The team introduced rabbit CYP2E1 to the ivy's genome and injected benzene or chloroform gas into closed vials that contained growing plants. After 3 days, the concentrations of these compounds in the vials had dropped dramatically, and by 8 days, chloroform was barely detectable. In contrast, the compounds' concentrations in vials containing unmodified ivy or no plants did not change. The researchers estimate that a hypothetical biofilter made of the genetically modified plants would deliver clean air at rates comparable to commercial home particulate filters.

The authors acknowledge funding from the National Science Foundation, Amazon Catalyst at the University of Washington and the National Institute of Environmental Health Sciences.

From the ACS Press Room

E-bandage generates electricity, speeds wound healing in rats

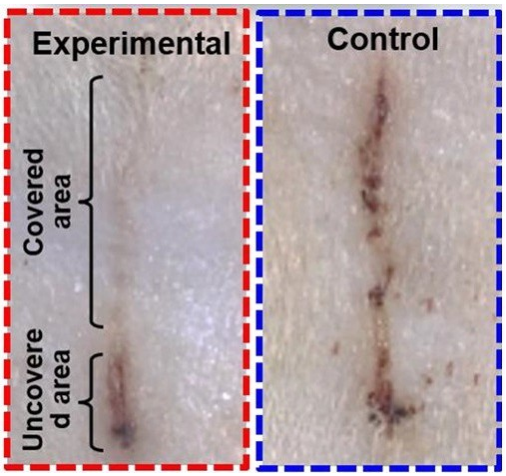
Effective Wound Healing Enabled by Discrete Alternative Electric Fields from Wearable Nanogenerators
ACS Nano

Skin has a remarkable ability to heal itself. But in some cases, wounds heal very slowly or not at all, putting a person at risk for chronic pain, infection and scarring. Now, researchers have developed a self-powered bandage that generates an electric field over an injury, dramatically reducing the healing time for skin wounds in rats. They report their results in ACS Nano.

Chronic skin wounds include diabetic foot ulcers, venous ulcers and non-healing surgical wounds. Doctors have tried various approaches to help chronic wounds heal, including bandaging, dressing, exposure to oxygen and growth-factor therapy, but they often show limited effectiveness. As early as the 1960s, researchers observed that electrical stimulation could help skin wounds heal. However, the equipment for generating the electric field is often large and may require patient hospitalization. Weibo Cai, Xudong Wang and colleagues wanted to develop a flexible, self-powered bandage that could convert skin movements into a therapeutic electric field.

To power their electric bandage, or e-bandage, the researchers made a wearable nanogenerator by overlapping sheets of polytetrafluoroethylene (PTFE), copper foil and polyethylene terephthalate (PET). The nanogenerator converted skin movements, which occur during normal activity or even breathing, into small electrical pulses. This current flowed to two working electrodes that were placed on either side of the skin wound to produce a weak electric field. The team tested the device by placing it over wounds on rats' backs. Wounds covered by e-bandages closed within 3 days, compared with 12 days for a control bandage with no electric field. The researchers attribute the faster wound healing to enhanced fibroblast migration, proliferation and differentiation induced by the electric field.

The authors acknowledge funding from the National Institute of Biomedical Imaging and Bioengineering of the National Institutes of Health.



A wound covered by an electric bandage on a rat's skin (top left) healed faster than a wound under a control bandage (right). American Chemical Society

OBITUARY
LARRY SMITH

Long time active local ACS section member **Dr. Larry Smith** died on Dec. 8, 2018 at age 74. Smith served *The Southwest Retort* as Business Manager in 1995-96 and served the DFW section as Chair-Elect in 1981, Chair in 1982, and Past Chair in 1983.

Smith was born on June 26, 1944, in Hughes Springs, TX, where he grew up. He earned a BA in chemistry at UNT in 1968. He also met his future wife Lee Ellen while he was at UNT. He went on to receive his Ph.D. in organic chemistry at UNT in the remarkably short time of two years. He then continued his education at SMU earning a MBA in 1988. He worked as an industrial chemist for American Hoechst and later for Sun Oil Company. Larry was the Director of Research Administration at Southern Methodist University until his retirement in 2008. He was owner and operator of Knotsmith, a custom-braided lanyard company. Larry was also a long-time member of First Baptist Church of Richardson and an active member of the Dallas Gun Club. He is preceded in death by his parents G.W. and Louise Smith. Larry is survived by his wife, Lee Ellen Smith; son, Travis Smith and his wife, Jennie and their daughters, Cori Smith and Laura Smith; daughter Jennifer Smith Gilmer and husband, David Gilmer II; and brothers, Ron Smith and B. J. Smith.

DFW Section

Nominations are invited for awards: Doherty, Schulz, and Chem Ambassador

The Doherty Award is given for excellence in chemical research or chemistry teaching, meritorious service to ACS, establishment of a new chemical industry, solution of pollution problems, and advances in curative or preventive chemotherapy. Nominees may come from industry, academia, government, or small business. The nominee should be a resident member in the area served by the DFW Section, and the work should have been done here. The award is $1500 and an engraved plaque.

The Schulz Award is given to high school chemistry teachers, who, like the late Dr. Werner Schulz, bring that something extra to the teaching of chemistry. The nominee and/or nominator need not be ACS members. Nominees should show excellence in chemistry teaching as demonstrated by testimonials from students and fellow teachers, results in student competitions, and diligence in updating and expanding scientific/teaching credentials. lectures at a fall meeting of the section.

The Chemistry Ambassador Award is newly instituted by the DFW Section to recognize an outstanding Section member who has made a significant impact via promoting chemistry to the community. The 2019 Chemistry Ambassador of the Year award is based on peer or self-nominations to the selection committee. Submissions should be one page in length and address the community outreach activities either through teaching, service, or working with legislators to affect public policy. Submissions will be evaluated on the impact made, which may include but not limited to how many people were reached, impact on individual people in the community, and exemplary commitment to the promotion of chemistry in the community.

Remember, a continuous flow of nominations is needed to maintain the quality of awards. Each nomination should contain completed nomination form, cover letter highlighting the nominee's accomplishments, and a copy of the CV. One seconding letter may accompany nominations. The nomination package should be sent by email as a single pdf file to Sean O'Brien at sobrien@ti.com. Nominations remain active for five years but should be updated annually.

Complete information and nomination forms are available at

https://dfw.sites.acs.org/awards.htm

Deadline May 15

ACS Local Section
Dallas-Fort Worth

52nd Annual Meeting-in-Miniature

Saturday, April 27, 2019

We invite and encourage graduate and undergraduate students to submit abstracts for 10-12 minute oral presentations, with an additional 3-5 minutes for questions. Submit your abstract using the link below.
The submission deadline is **April 5, 2019**, although earlier is better.

All presenters and attendees must register no later than **April 5, 2019**, although earlier is better.
Please note that there is NO fee to attend the meeting. Registration is required because lunch will be provided by the Department of Chemistry (at no cost to the attendees), so we need an accurate head-count.

Visit our website to submit your abstract and register for the DFW-ACS Meeting-in-Miniature
https://chemistry.unt.edu/meeting-in-miniature

DEPARTMENT OF CHEMISTRY
College of Science
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9:00-9:30AM	Check-in
9:30-11AM	Session 1
11:00-11:15AM	Morning break
11:15-12:45PM	Session 2
12:45-1:45PM	Lunch
1:45-3:15PM	Session 3
3:15-4:00PM	Entertainment (TBA)
4:00PM	Awards Ceremony

From the ACS Press Room

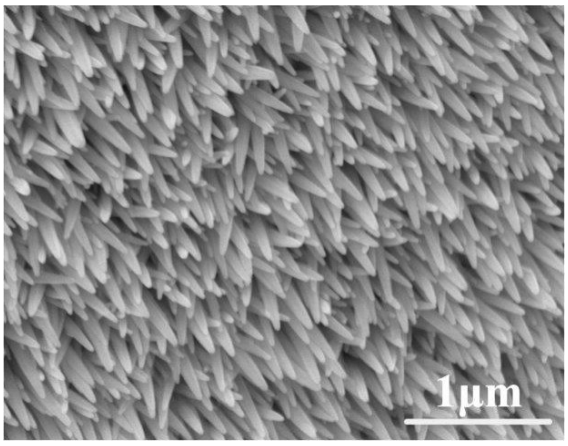
Artificial bug eyes

Artificial Compound Eyes Prepared by a Combination of Air-Assisted Deformation, Modified Laser Swelling, and Controlled Crystal Growth
ACS Nano

Single lens eyes, like those in humans and many other animals, can create sharp images, but the compound eyes of insects and crustaceans have an edge when it comes to peripheral vision, light sensitivity and motion detection. That's why scientists are developing artificial compound eyes to give sight to autonomous vehicles and robots, among other applications. Now, a report in ACS Nano describes the preparation of bioinspired artificial compound eyes using a simple low-cost approach.

Compound eyes are made up of tiny independent repeating visual receptors, called ommatidia, each consisting of a lens, cornea and photoreceptor cells. Some insects have thousands of units per eye; creatures with more ommatidia have increased visual resolution. Attempts to create artificial compound eyes in the lab are often limited by cost, tend to be large and sometimes include only a fraction of the ommatidia and nanostructures typical of natural compound eyes. Some groups are using lasers and nanotechnology to generate artificial bug eyes in bulk, but the structures tend to lack uniformity and are often distorted, which compromises sight. To make artificial insect eyes with improved visual properties, Wenjun Wang and colleagues developed a new strategy with improved structural homogeneity.

As a first step, the researchers shot a laser through a double layer of acrylic glass, focusing on the lower layer. The laser caused the lower layer to swell, creating a convex dome shape. The researchers created an array of these tiny lenses that could themselves be bent along a curved structure to create the artificial eye. Then, through several steps, the researchers grew nanostructures on top of the convex glass domes that, up close, resemble a shag carpet. The



nanostructures endowed the microlenses with desirable antireflective and water-repellent properties.

The authors acknowledge funding from the National Natural Science Foundation of China, National Key Research and Development Program of China, and Program for Changjiang Scholars and Innovative Research Team in University.

From the ACS Press Room

Environmentally 'friendly' flame retardant could degrade into less safe compounds

Degradation of the Polymeric Brominated Flame Retardant "Polymeric FR" by Heat and UV Exposure
Environmental Science & Technology

To reduce the risk of fire, many everyday products — from building materials to furniture to clothing — contain flame retardants. In recent years, some of these compounds were shown to have harmful effects on the environment, causing them to be replaced by more eco-friendly alternatives. However, a new study in ACS' journal Environmental Science & Technology, indicates that heat or ultraviolet light could break down a "safe" flame retardant into potentially harmful compounds.

Some brominated flame retardants, such as hexabromocyclododecane (HBCD), persist and bioaccumulate in the environment, potentially having toxic effects on organisms. As a result, some international regulatory bodies have banned HBCD, which is commonly used in polystyrene foam insulation. A replacement for HBCD, polymeric flame retardant (polyFR) is a large polymer that it is much less likely to enter cells or accumulate in the food chain. Although polyFR is considered a more environmentally friendly flame retardant, the long-term behavior of the chemical is unknown. So Christoph Koch, Bernd Sures and colleagues examined whether heat or ultraviolet light — which could be encountered during the product's use as insulation in a hot attic or after its disposal in an open landfill — could break down polyFR into smaller, potentially more harmful substances.
To simulate different environmental conditions polyFR might encounter during its lifetime, the researchers exposed the flame retardant powder to heat (140 F) or ultraviolet light and analyzed the samples with mass spectrometry. When the researchers irradiated polyFR with ultraviolet light for 3 hours, they detected 75 different degradation products, including eight containing bromine. In contrast, heat treatment for 36 weeks yielded only seven degradation products, one of which contained bromine. Because some of the detected compounds were small and brominated, they have the potential to be harmful, say the researchers. The team notes that polyFR may degrade differently when incorporated with polystyrene into foam insulation.

The authors do not acknowledge any funding sources.


Fort Worth Life Sciences Coalition
ACS Local Section
Dallas-Fort Worth
'So, You Want to Be a Consultant'
w/ Scroll-A- Rama
January 17, 2019 7.30p - 10.30p
@ A5A 1628 5th Ave 76104
JOIN FWLSC & ACSDFW
for a Panel Discussion Among Expert Consultants
Music, Desserts, Beverages, an Interesting Program
and the People You Need to Know
Register via Eventbrite - Deadline 1/15/19
Periodic Table of the Elements

From the editor

Again, I would like to mention that the 52nd Meeting-in-Miniature is scheduled for April 2019. It might seem a little early to announce it, but there's never too much time left in getting your students ready for their presentations. Standing in front of a group and talking about your research is one of the best training experiences for a future scientist.

The DFW Section is soliciting nominations for the Doherty, Schulz, and Chemistry Ambassador awards. Information and forms are available at

https://dfw.sites.acs.org/awards.htm.

Over the years since I have been Retort editor, we have received many favorable comments on Dr. Denise Merkle's column *And Another Thing*. She is beginning a stint as Section Chair, so she will be taking off 2019; we'll look forward to seeing it again in the future.

I don't think I have a favorite among the press releases this month, although the genetically modified pothos ivy might run first. Researchers introduced the mammalian gene CYP2E1 into a common houseplant, pothos ivy (Epipremnum aureum); the gene encodes cytochrome P450 2E1, an enzyme that breaks down a wide range of volatile organic compounds. Modified plants cleared benzene and chloroform at a rate thought comparable to commercial filters.