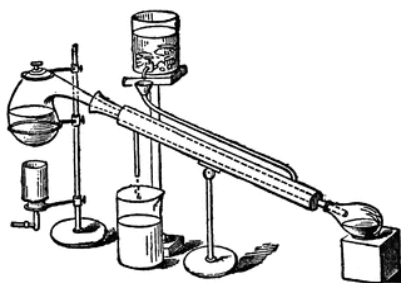




SOUTHWEST RETORT



SIXTY-NINTH YEAR

MARCH 2017

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Chemists, Chemical Engineers
and Chemistry in this area*

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EMPLOYMENT CLEARING HOUSE

Job applicants should send name, email, and phone, along with type of position and geographical area desired; employers may contact job applicants directly. If you have an opening, send your list-Deadlines are the 7th of each month. ing, including contact info for your company, to retort@acsdfw.org.

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gations, batch records and reports and translate contract requirements for JenKem Technology departments.

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Previous working knowledge of cGMP manufacturing in the US or Europe, preferably polymer-related or pharmaceutical manufacturing.

Outstanding demonstrated interpersonal skills in English and Mandarin (Chinese) a must (both written and oral)

Proven aptitude for project management tools. Proficiency using project management tools to oversee all elements of project lifecycle including scheduling/planning, meeting coordination, tracking of costs and deliverables, reporting to stakeholders, and risk mitigation. Project Management Certification a plus.

Computer and software skills including MS Office Suite programs, Internet, email systems required.

Proven multi-tasking skills able to handle multiple projects simultaneously within a GMP environment; ability to motivate teams, work within aggressive timelines collaboratively with cross-functional departments

Demonstrated ability to work as a strong contributor in a team environment on complex projects.

Required skills include strong communication, leadership, decision-making, organizational and analytical skills. A candidate must be able to maintain customer focus, handle difficult discussions, build consensus, work independently and prioritize multiple tasks and adjust quickly, as needed. The ideal candidate must be willing to pursue tasks that may be required for projects but are not clearly defined within this job description.

Detail-oriented, dependable, motivated, ability to work with minimal supervision.

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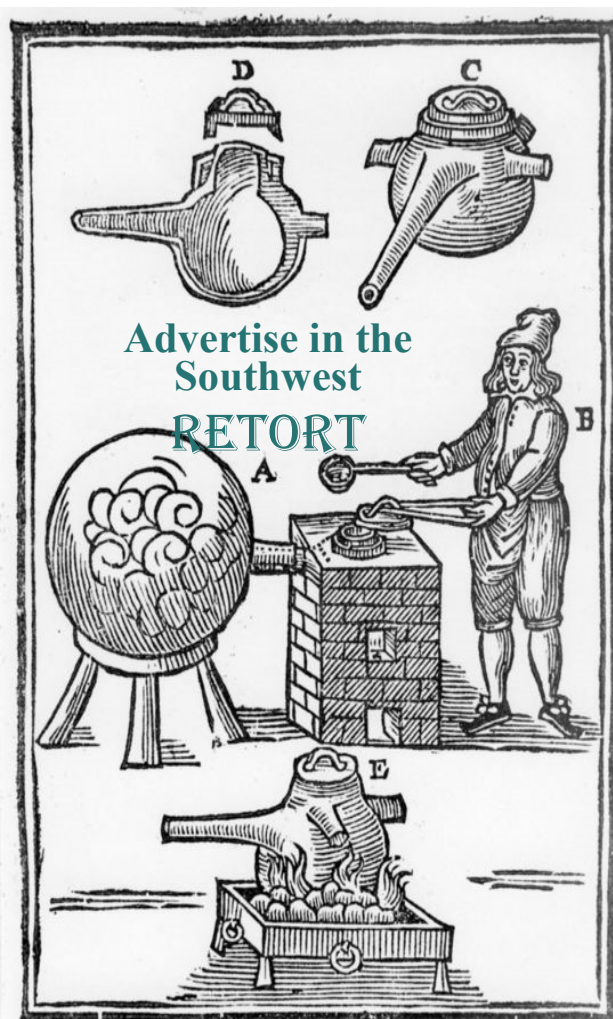


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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The ACS tour speaker for the month of March is Dr. David C. Sayles from the U.S. Army Missile Command at Redstone Arsenal, Alabama. He will be speaking on one of four topics: "The Applications of Elastomers in Solid rocket Power Plants," "Polyester Alkyd Resin Technology," "Catalytically Influencing the Reactions of Organometallic Compounds," and "The Technology Involved in Rocket Propellants."

At Texas Woman's University Dr. Lyman Caswell was a panelist in Kansas City, Mo, on Feb. 21-24 to evaluate NSF proposals in the Undergraduate Scientific Instructional Equipment Program. Dr. George L. Landolt has returned to the Chemistry Department at Austin College after a three year leave of absence as a visiting professor in the Engineering College of Chung-Hsing University in Taichung, Taiwan. Dr. W. B. Smith recently gave a seminar at Austin College.

The first Ph.D. in chemistry from North Texas State University was given in January to Dr. Linda T. Creagh. Her dissertation was titled "Nuclear Magnetic Resonance Spectra of 1,2,4-Triazoles." New Welch grants were given to North Texas faculty members L. Theriot (\$36,000) and Dr. R. Hurd (\$36,000). Dr. W. Glaze received a \$60,000 Welch renewal grant. Recent seminars were given by faculty members Dr. C. G. Skinner (Arlington State College) and Dr. W. T. Brady (Rice).

At Texas Tech Dr. W. C. Herndon gave a seminar at the University of Oklahoma on Feb. 16. Dr. P. S. Sung and graduate student Bill Curtin attended the Photochemical Symposium in Houston Feb. 17-18.

In San Antonio ACS activities, at Trinity University Dr. John Burke accompanied ACS affiliate members on a field trip to Dallas Feb. 3-5. The group visited the Food and Drug Administration Laboratories, Mobil Oil Laboratories, and the University of Texas Southwest Medical School. At St. Mary's University the Science Department recently purchased a \$14,000 Perkin-Elmer gas chromatograph using matching funds from NSF. The Science Department has applied for a \$300,000 NSF grant to purchase equipment needed for courses in specialized fields. The new Chairman of the San Antonio ACS Section is John C. Millar. John was born in Dallas. He moved to San Antonio prior to World War II, during which he served in a combat engineering office in Europe. After the war, he returned to San Antonio, receiving a B.A. degree in chemistry from Trinity University. John is a Senior Analytical Chemist at Southwest Research Institute, where he has worked nearly 20 years.

Contributed by
E. Thomas Strom



CALL FOR VOLUNTEERS: SUMMER EXPERIENCE IN ANTIBIOTIC DISCOVERY AND DEVELOPMENT (SEADD)



What is SEADD?

An advanced summer program covering the broad range of careers and experimental techniques involved in pharmaceutical development from lead compound discovery to FDA approval and commercialization. As part of the first ever Summer Experience in Antibiotic Discovery and Development (SEADD) led by The Shoulders of Giants, twenty high school girls will delve into sixty hours of hands-on curriculum with a focus on the chemistry, biochemistry, molecular biology, and microbiology involved in discovering new antibiotics.

What do we need?

We are looking for two types of volunteers, **teaching assistants** and **speakers**. Teaching assistants are students of any level or professionals with experience in organic synthesis, computational chemistry, bacterial cell culture, PCR, or gel electrophoresis. Teaching assistants can volunteer for the duration of the program or on a part-time basis in morning (9am - 12pm) or afternoon (1pm - 4pm) shifts. Speakers are experienced industry professionals or professors who feel like they could give an hour long talk on *any* topic in drug discovery or development, including but not limited to, high throughput screening, natural product synthesis, rational drug design, SAR, clinical testing, drug formulation, and process chemistry.

Who are we?

The Shoulders of Giants (TSoG), a 501(c)(3), provides a 4,000 sq. ft. science and engineering teaching lab in northeast Dallas for passionate individuals, faculty, staff, and volunteers to innovate in the world of education. TSoG offers a year-round high school mentorship program which provides rigorous, supplementary courses in science in engineering. TSoG also presents outreach events throughout the year, bringing TSoG programming to students outside of our facility and across the metroplex.

**Program held at Camp Whispering Cedars
6010 Whispering Cedars Drive, Dallas, TX 75236**

This is a two day a week, five-week program that will be held Tuesdays and Thursdays between June 13th to July 20th, with no programs held during the week of July 4th. Class day schedule is 9am – 4pm with an hour break for lunch.

For more information on SEADD, as well as other STEM outreach volunteer opportunities with TSoG, please contact Mandy Dark at The Shoulders of Giants
682-552-0649 or email mandydark@tsogiants.org

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Antimicrobial substances identified in Komodo dragon blood

Discovery of Novel Antimicrobial Peptides from *Varanus komodoensis* (Komodo dragon) by Large Scale Analyses and *De Novo*-Assisted Sequencing using Electron Transfer Dissociation Mass Spectrometry
Journal of Proteome Research

In a land where survival is precarious, Komodo dragons thrive despite being exposed to scads of bacteria that would kill less hardy creatures. Now in a study published in the *Journal of Proteome Research*, scientists report that they have detected antimicrobial protein fragments in the lizard's blood that appear to help them resist deadly infections. The discovery could lead to the development of new drugs capable of combating bacteria that have become resistant to antibiotics.

The world's largest lizard, Komodo dragons live on five small islands in Indonesia. The saliva of these creatures contains at least 57 species of bacteria, which are believed to contribute to the demise of their prey. Yet, the Komodo dragon appears resistant to these bacteria, and serum from these animals has been shown to have antibacterial activity. Substances known as cationic antimicrobial peptides (CAMPs) are produced by nearly all living creatures and are an essential part of the innate immune system. So, Barney Bishop,



Monique van Hoek and colleagues at the College of Science at George Mason University wondered whether they could isolate CAMPs from Komodo dragon blood, as they previously had done with alligator blood to expand the library of known CAMPs for therapeutic studies.

The team used an approach known as bioprospecting. They incubated Komodo dragon blood with negatively charged hydrogel particles that they developed to capture the peptides, which are positively charged. With this method, they identified and sequenced 48 potential CAMPs with mass spectrometry. All but one of these was derived from histone proteins, which are known to have antimicrobial activities. Eight were synthesized and tested against *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Seven of the peptides showed significant potency against both bacteria. The eighth was only effective against *P. aeruginosa*. The researchers conclude that Komodo dragon blood plasma contains a host of potentially viable antimicrobial peptides that could help lead to new therapeutics.

The authors acknowledge funding from the Defense Threat Reduction Agency (DTRA).

Dallas-Fort Worth Section of the American Chemical Society 50th Annual Meeting-in-Miniature



Saturday, April 29

All graduate and undergraduate students are invited to submit abstracts for a 10-12 minute oral presentation, allowing 3-5 minutes for questions. Email your ACS-style abstract to b.janesko@tcu.edu with the subject line "Meeting in Miniature Abstract Submission" by Friday, March 31.

REQUIRED ABSTRACT DETAILS:

- Title of presentation
- Underline presenting author and put * next to advisor
- List department and university
- Division (analytical, biochemistry, inorganic, organic, physical etc.)
- Email address of presenting author
- Category (undergraduate or graduate)
- Paragraph to include motivation, methods, results, conclusions (no more than 200 words)

Program Details

Department of Chemistry & Biochemistry
Texas Christian University

8 - 8:30
8:30 - 10
10 - 10:15
10:15 - 11:45
11:45 - 1:15
1:15 - 3:30
3:30 - 4:30
4:30

Check-in
1st Session presentations
Morning break
2nd Session Presentations
Lunch
3rd Session presentations
Tours and Reception
Awards Ceremony

Multiple awards will be given to top presentations for each session.
Registration is free. Register here: <http://ow.ly/opp430863rx>



COLLEGE OF
SCIENCE & ENGINEERING



2017 SCI-SW Regional Meeting

Leaders at the SENCER Center for Innovation-Southwest (SCI-SW) hosted their third annual Regional Symposium at Texas Woman's University (TWU) on February 2-3, 2017. This year's theme was, "Expanding civic capacity: Connecting learning to critical real-world issues through teacher preparation and faculty development."



April Hill, Richmond Univ

The symposium began on Thursday afternoon with a welcome from Dr. Abigail Tilton, Dean of the TWU College of Arts and Sciences. Thursday afternoon talks focused on how we can prepare STEM teachers using SENCER pedagogy. Six nationally-recognized leaders from the SENCER community offered their insights and experience to the audience.

The first talk presented by Dr. April Hill from Richmond University discussed a set of validated principles and practices for fostering student thriving in undergraduate STEM majors. She explained how to expand lab sections into authentic research experience and how including civic engagement and evidence-based pedagogy can lead to student persistence. The second talk by Dr. Stephen Carroll from Santa Clara University addressed durable learning and ways to make learning long lasting. He used his grant-writing course as an example of how he included civ-

ic issues in his class and how the practices result in deeper and more durable learning in his students. During the Thursday afternoon session, Dr. Cathy Middlecamp from University of Wisconsin-Madison gave examples of how she teaches practice-based courses and how to balance between content and social context in classrooms. Her main message was teaching context and teaching content is not an either/or proposition; rather, they are two sides of teaching the same coin. She explained how we can start with the social issues and connect back to the concepts we teach.

Dr. Reid Bishop from Belhaven University gave examples of how SENCER ideas resulted in a water conservation project at their local zoo, and how his



Reid Bishop, Belhaven Univ

students were able to solve some of the zoo's problems. Dr. Garon Smith from the University of Montana offered examples of how undergraduate research can be used in teacher preparation courses. He emphasized educators' need to make sure that students' STEM experiences are both exciting and focus on solving relevant problems. From Rider University, Dr. Kathy Browne discussed the Next Generation Science Standards (NGSS) for educating K-12 students and how we could include civic issues to en-

2017 SCI-SW Regional Meeting *cont.*

gage students. She further discussed how NGSS can be used to include civic engagement in teaching science principles.

The second session on Friday morning was centered on how SENCER techniques can help faculty, especially tenure-track, develop fulfilling and successful careers. Dr. Jennifer Martin, TWU Interim Provost and Vice President for Academic Affairs, welcomed everyone to TWU and emphasized her appreciation for the enthusiasm she sees for SENCER ideas. After the welcome, SCI-SW co-directors Nasrin Kohan and Cynthia Maguire expressed their gratitude to Dr. Richard D. Sheardy, Professor and Chair of the TWU Department of Chemistry and Biochemistry, for his inspiration, expertise and passion while serving as a SCI-SW co-director. Sheardy will continue to serve as the center's liaison to the SCI-SW advisory board.

The first speaker of the day, Dr. Ed Katz from University of North Carolina at Asheville, suggested looking for an idea/project that allows you to connect teaching, service and scholarship. Through connecting all these you are working on one large project instead of juggling to manage three separate ac-

tivities for your career. In his second talk during this symposium, Dr. Stephen Carroll discussed using the SALG assessment instrument (SALGsite.org). He explained that



Nasrin M. Kohan, Richard D. Sheardy and Cynthia Maguire, TWU

SALG has been designed to promote metacognition for students and provide meaningful feedback to faculty—a “win-win” situation. Use of the instrument is free and accepted by many accreditation agencies. Dr. Karen Oates talked about how to keep your career on track but also find your

passion. She emphasized the quote by O. W. Holmes, “Most of us go to our graves with the music still inside us,” and discussed what this means and how to make sure we follow our dreams.

Dr. Dick Sheardy from TWU addressed the tenure-track career from a chair's perspective. He emphasized that involving civic engagements in research and classes can be counted as scholarship and should be included in promotion packages, but also expounded that each faculty needs to talk to their chair and administrators to understand the expectations at a particular institution. He gave examples of how we can expand our students' horizons by showing them the real world issues, and how this makes disciplinary content knowledge important in

2017 SCI-SW Regional Meeting *cont.*



Symposium speakers (L to R): Tom Wood, Stephen Carroll, Matt Fisher, Garon Smith, Ed Katz, Kathy Browne, Karen Oates and Richard Sheardy. Not pictured are April Hill and Reid Bishop.

students' eyes. From George Mason University, Dr. Tom Wood's presentation highlighted the importance of being exposed and connected to the natural world. He said students who go to a natural area for a few hours the day before an exam score about 20% higher. He raised the question, "Don't we have an obligation as educators to do better at connecting students with the natural world?" Dr. Matthew Fisher from Saint Vincent College talked about the scholarship of teaching and encouraged everyone to build upon work of others. He talked about how we can design courses for science majors in such a way that we encourage their engagement and sense of responsibility as scientists.

At the closing remarks on Friday, SCI-SW leaders recognized NCSCE staff members Kyle Simmons, Christine DeCarlo, Danielle Kraus Tarka and

thanked Dr. Kim Miloch, Director, and Ms. Kaye Garrison, Senior Secretary, of the Learn by Doing Quality Enhancement Plan (QEP) at TWU, for their extensive support and assistance with the regional meeting.

Preceding the symposium this year, on Thursday morning a newly formed SCI-SW Advisory Board meeting was held with the members of the advisory board and faculty and administrators from TWU. Plans were discussed to strengthen the SENCER community at TWU and in the southwest region.

For the first time, this year SCI-SW planned a field trip on Friday afternoon to the Clear Creek Natural Heritage Center for the symposium speakers and SENCER co-directors visiting from out of state. As expressed by the attendees, it was a great field trip learning about wildlife of Texas.

Contributed by:
Cynthia McGuire, Co-Director,
SENCER Center for Innovation-
Southwest

And Another Thing...

By Denise Merkle, PhD

Really?

In addition to the usual deadlines this week (arrrrgh!), a puzzling communication from the company hosting mary-thecaterpillar.com appeared. In case you don't know and haven't figured it out, "The Story of Mary the Caterpillar" is not a scientific publication, but it does exist in hardcopy - and also on the web. However, per the unexpected gmail, the coding on Mary the Caterpillar's antique website had gone seriously wonky. According to the Troubleshooting Team, the webhost removed some code and left some code, and recommended a professional review of the code, etc. What? What does this mean? One thing it meant was the immediate, dreaded, 'Is this e-mail even Real?' call to the webhost. After an interminable hold, a non-electronic representative appeared on the line. I'll call him Q. I asked Q, 'Is this even Real?' More Holding, with the required static hinting at what might, in a long-past previous life, have been music. (How difficult would it be to play music that has some technological integrity? Rhetorical question, obviously, it's impossible.) Anyway. Per Q, 'Yes, it's real.' Of course I had to ask, 'What does all this even mean?' Q was brutally honest about the implications, 'I'm sorry. I don't

know. If I knew, I wouldn't be answering phones, I'd be sending e-mails like the one you received—and making a lot more money.' Fair enough.

So, after what felt like a millennium and quite a lot of TechSplaining (aka the ManSplaining of the programming world), I wound up with an updated hosting plan, a new and improved (Ha!) web design app, and a headache.

It's a demanding little app—

App: What will your site focus on?
Answer this or we won't let you advance! Answer! Answer!

Me: Children's book.

App: What is the title? Answer this or we won't let you advance! Answer!
Answer!

Me: The Story of Mary the Caterpillar.

App: Wait! We are gathering photos and generating potential themes for you.

Select a Theme! Select a Theme! Select a Theme!

As instructed, I browsed the children's book website themes, while thinking that none of them looked remotely like a children's book I'd want to read, unless I was into grim, frightening Victoriana. And then, the comic relief in the in the process struck, as it always does.

Continued on page 14

Around the Area

UT-Arlington

Dr. Alejandro Bugarin recently served as a reviewer for NIH. The reviews of R15, R21, and R01 grants took place on Feb. 8-9.

Remember, the Retort is on issuu.com. One good thing about issuu.com is that you can subscribe to your publication; if you put in your email (right next to the Retort on the site), you will automatically get the Retort when we post it. (In order to subscribe, download, or print, you need to register with issuu.com; it's free and you can opt out of extraneous emails.)

And Another Thing... *Continued from page 13*

I kid you not—one of the themes was a close-up of a road with double yellow lines running down the middle overlaid with a plaque containing the book title.

Caterpillar. Highway. Children's Book. Baaaad combo. Very Bad Combo. Recalculating.

The app didn't demand this, but I suggest it: Parties interested in visiting marythecaterpillar.com should wait a while—a week or so—maybe a month. The app isn't finished with me—yet.

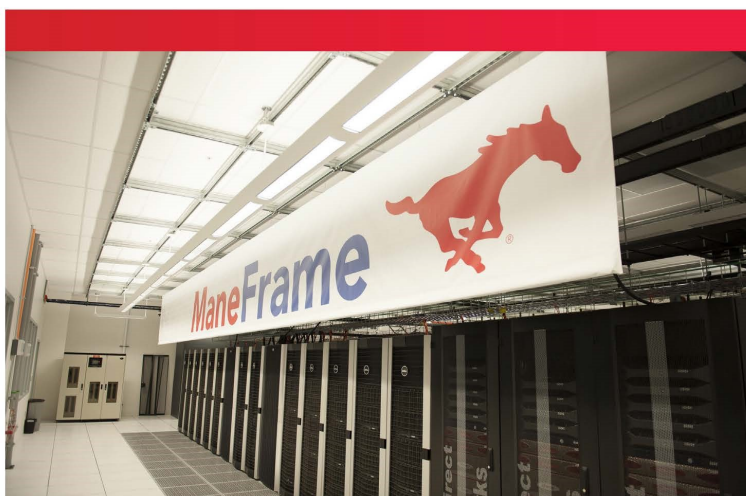
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- Master computational tools to carry out world-class research in a high-performance computer environment
- Receive individual mentorship from a close community
- Utilize SMU's High Performance Computing Center ("ManeFrame")

Jackfruit seeds could help ease looming cocoa bean shortage

Optimization of Postharvest Conditions to Produce Chocolate Aroma from Jackfruit Seeds

Journal of Agricultural and Food Chemistry

Chocolate lovers could soon have a harder time satisfying their sweet tooth. Worldwide demand for this mouth-watering treat is outstripping the production of cocoa beans, its primary ingredient. But in a study published in the *Journal of Agricultural & Food Chemistry*, scientists report that compounds found in jackfruit seeds produce many of the same aromas as processed cocoa beans and are a potentially cheap, abundant substitute for use in chocolate manufacturing.

Globally, farmers produce about 3.7 million tons of cocoa annually. This yield is not expected to increase significantly in the next decade, but estimates suggest that worldwide demand for these beans will grow to 4.5 million tons by 2020. To meet growing expectations, scientists are investigating alternative sources that can mimic chocolate's distinct aroma and flavor. One of these possibilities is jackfruit, a large tropical fruit found in South America, Asia, Africa and Australia. In some countries, its sweet-smelling seeds are boiled, steamed and roasted before eating, providing a cheap

source of fiber, protein and minerals. But in Brazil, the largest cocoa producer in the Americas, jackfruit seeds are considered waste. Looking to put these waste seeds to better use, Fernanda Papa Spada, Jane K. Parker, Solange Guidolin, Canniatti Brazaca and colleagues sought to determine if any of the compounds within them could be used to produce chocolate aromas.

The researchers made 27 jackfruit seed flours by acidifying or fermenting the seeds prior to drying. They roasted these flours for various times and temperatures using processes similar to those used to enhance the chocolaty flavor of cocoa beans. Using gas chromatography-mass spectrometry, the team identified several compounds from the jackfruit flours that are associated with chocolate aromas, including 3-methylbutanal, 2,3-diethyl-5-methylpazine and 2-phenylethyl acetate. They also asked volunteers to smell the jackfruit seed flours and describe the aromas. In contrast to the acidified flours, the fermented ones were described as having more positive attributes, such as caramel, hazelnut or fruity aromas. The researchers conclude that jackfruit seeds are capable of producing chocolate aromas and are a potential replacement for the aroma of cocoa powder or chocolate.

Some marine creatures may be more resilient to harsher ocean conditions

Mineralogical Plasticity Acts as a Compensatory Mechanism to the Impacts of Ocean Acidification

Environmental Science & Technology

As the world continually emits carbon dioxide into the atmosphere, the oceans are taking a hit, absorbing some of it and growing more acidic. Among other effects, scientists have found that coral reefs and oyster hatcheries are deteriorating as a result. However, scientists studying a type of sea snail report a bit of bright news in the ACS journal *Environmental Science & Technology*: The animal can adapt by rejiggering its shell-making process and other functions.

A lower pH in ocean waters means fewer carbonate ions are available to calcifying organisms, such as coral reefs and oysters, which need the ions to produce shells and skeletons. While ocean acidification appears to cause damage to many calcifying organisms, recent studies have suggested that some of those organisms may be more resistant to acidification than previously thought.



A periwinkle sea snail.

Picture courtesy of sciencedaily.com

Sean D. Connell and colleagues wanted to find out how this might be possible.

The researchers exposed sea snails called periwinkles to the ocean conditions predicted for 2100, when some waters at a pH of 8.10 today are expected to reach a pH of 7.85. Although the animals' metabolism declined, they were able to speed up their shell-making by producing less-dense inner shells. In addition, they developed less-soluble shells, which are more resistant to future, harsher ocean conditions. The researchers say these changes suggest that the periwinkle, and potentially other calcifying organisms, could have the ability to adapt to the acidifying oceans.

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Critters, plants and waste offer a more sustainable supply of catalysts

A more natural approach to catalysts

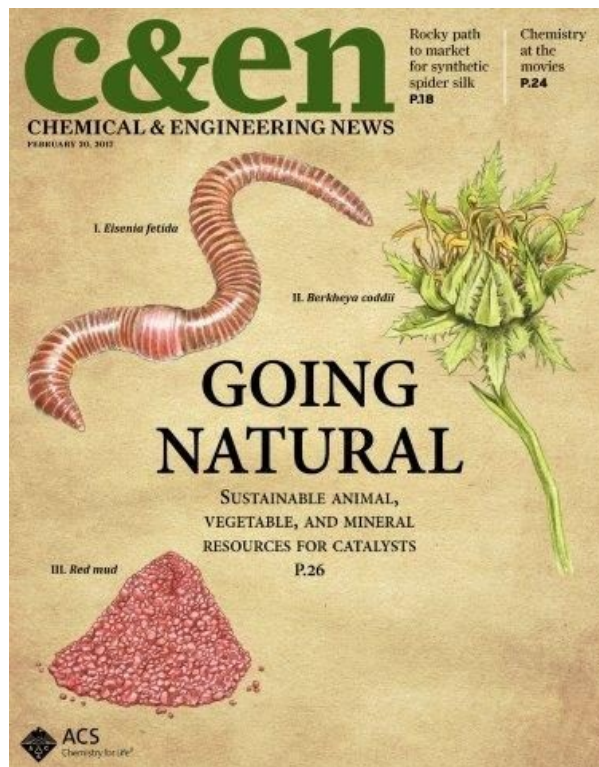
Chemical & Engineering News

From earthworm guts to mining waste, scientists are exploring a wide range of new sources of catalysts that could help us make medicines, fuels and electronics in a more sustainable way. The cover story in *Chemical & Engineering News* (C&EN), the weekly newsmagazine of the American Chemical Society, reports on the search.

Stephen K. Ritter, a senior correspondent at C&EN, notes that humans have used nature's catalysts dating back thousands of years, starting with enzymes from yeast to make bread, cheese, beer and wine. But in the 1970s, the advent of modern biotechnology allowed industry to shift from traditional animal and plant sources of enzymes to genetically modified organisms that could make the substances cheaper with higher purity and efficiency. The Earth's metals and minerals can also catalyze chemical reactions, but mining these substances from deep within the ground is becoming less economical.

To find new, more sustainable catalysts, scientists are scouring unexpected sources. One team has created an enzyme-packed earthworm powder that can help produce the blood-

thinning medicine warfarin. As an alternative to underground mining for metals and minerals, researchers are sifting through above-ground possibilities. Agromining, for example, involves plants that take up high levels of metals from soil and water that can later be harvested and processed. The search could also help get rid of traditional mining waste, which itself contains recoverable minerals.



From the editor

This issue has something for everyone, I think. The 50th Meeting-in-Miniature for the DFW Section is in April; don't miss it. The first SEADD event (Summer Experience in Antibiotic Discovery and Development), put on by The Shoulders of Giants and sponsored by the Girl Scouts of Northeast Texas) needs volunteers for the summer program. The Fort Worth Opera's spring season is coming up, and they are offering a discount for us chemists!



This month we have articles on Komodo dragon blood, ground-up earthworms as catalysts, and resilient sea snails; take your pick. However, my favorite press release in this issue is the one on jackfruit-as-chocolate. According to the paper in *J. Ag. Food Chem.*, world production of cocoa will remain about the same while demand grows. Enter the noble jackfruit, a member of the fig/mulberry/breadfruit family. A major food source in itself, the roasted seeds

produce a number of molecules with chocolate aroma.

If you're not familiar with SENCER, it stands for Science Education for New Civic Engagements and Responsibilities; they had a great regional meeting at Texas Woman's University back in February. SENCER is (and I quote from the web site, <http://sencer.net/>) "the signature initiative of the National Center for Science & Civic Engagement, is a national project focused on empowering faculty and improving STEM teaching and learning by making connections to civic issues".

Best regards,
Connie