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The KU Geologic Record

In This Issue

Shaking Up The Field

Assistant professors Alison Olcott Marshall and Craig Marshall and grad student Julienne R. Emry set the paleontological community talking with the February publication of a paper in *Nature Geoscience*. Entitled "Haematite pseudomicrofossils present in the 3.5-billion-year-old Apex Chert," the paper shows that what had previously been interpreted as the oldest fossil evidence for life on Earth was not evidence of life.

"Raman spectroscopic analyses revealed that these features are solid hematite, not carbonaceous, as had previously been reported," Alison says. While this new evidence does not disprove the existence of life 3.5 billion years ago, it shows that we haven't yet found the fossils that prove life existed then.

"People had accepted these as the oldest morphological evidence for life, but it seems like what they had decided were (and what had been widely accepted in the field as) fossilized organisms are actually just mineral pseudofossils," Alison says. "To make it more interesting, we did find carbon in the rocks, carbon which could possibly have been formed by organisms, although right now it is not possible to determine if this is of biotic origin or not. We are currently working on analyzing this carbon to see if these rocks do in fact contain traces of ancient life in a form much more difficult to identify."

Since publication of the paper, Alison has been quoted in news reports about the difficulties of finding evidence of life. "One lesson we learn over and over again is that morphology is very common between minerals and life," she told *New Scientist*. "Finding circles and wiggles is not necessarily evidence of life."

On the Ice

Assistant Professor Leigh Stearns has been traveling to East Antarctica on a new three-year study of the large Byrd Glacier. Her group includes mountaineers as well as scientists and will employ GPS units, field observations and satellites to track how evenly and quickly the ice moves. The goal is to better predict how the glacier will act in the future. The work is funded by a $412,000 grant from the National Science Foundation.

Hasiotis goes to school

Associate Professor Steve Hasiotis has been bringing his insights on the Permian and Triassic to schools around the country as he pursues NSF-funded research in Antarctica. In January, for example, Steve and another colleague chatted with 5th graders at General Mitchell School in Cudahy, Wis., via satellite phone. Steve and his colleague were at a remote camp on the Beardmore Glacier. The students exchanged emails with Steve and followed his work for three months. The study focuses on the Triassic and Jurassic stratigraphy and sedimentology of the Trans-Antarctic Mountains.

Rankey Peers Into the Future

Assistant Professor Gene Rankey's work in Kiribati shows that the island nation faces a perilous future, although the dangers may not be what many expect. Kiribati is one of the low-lying Pacific nations that environmentalists have thought could disappear under rising sea levels – a situation caused by climate change.

In a paper in press for the journal *Sedimentology*, Gene presents evidence that the islands may not be simply shrinking. Instead, some shores are expanding, while others are eroding. The rate of change appears to be increasing, perhaps related to climate change.

"Even if an island does not change size, but the shoreline moves, it can be important," Gene says. "The distinction is important for those on island nations who literally build their houses right to the shoreline. Even if an island does not increase in size, but just shifts, if you live in that place where it shifted, you are in trouble."

The paper is entitled "Nature and stability of atoll island shorelines: Gilbert Island chain, Kiribati, equatorial Pacific."

Tracking the Brown Recluse

Grad student Erin Saupe and Professor Paul Selden joined with colleagues at two other universities to show the impact climate change may have on one of the most-feared spiders of North America – the brown recluse. In a paper published in *PLoS ONE* online in March, Erin and Paul used ecological niche modeling to delineate the spider's range boundaries.

They showed that under future climate change scenarios the spider's distribution might expand northward, potentially invading previously unaffected regions of the USA. Newly influenced areas may include parts of Nebraska, Minnesota, Wisconsin, Michigan, South Dakota, Ohio, and Pennsylvania. These results illustrate a potential negative consequence of climate change on humans and will aid medical professionals in proper bite identification/treatment, potentially reducing bite misdiagnoses.

The paper is entitled "Tracking a medically relevant spider: climate change, ecological niche modeling, and the brown recluse (Loxosceles reclusa)."

It's All In a Name

KU alums Celina and Marina Suarez received a rare honor on Dec. 15, 2010. On that day one of the oldest dinosaurs of its type ever identified in North America was named for the geochemists. The twins found the dinosaur's bones during a 2004 research trip in Utah. The dinosaur's name is Geminiraptor suarezarum. The name was announced in *PLoS.*

Celina and Marina are still surprised at their discovery of a new troodontid, or bird-like raptor, and their new distinction. Worldwide there are only about 700 named dinosaurs.

Celina (PhD '10) just started work as a postdoctoral researcher at Boise State University in Idaho. Marina (Ph.D. '09), is the Morton K. and Jane Blaustein Post-Doctoral Fellow at Johns Hopkins University's earth and planetary sciences department. This coming fall, Marina will begin a tenure-track position in geology at the University of Texas-San Antonio

An Evolutionary Surprise

Grad student Cori Myers and Professor Bruce Lieberman published a paper in the March 7, 2011, *Proceedings of the Royal Society*, suggesting that competition between species does not drive evolution. The paper is entitled "Sharks that pass in the night: using geographical information systems to investigate competition in the Cretaceous Western Interior Seaway."

Using new quantitative analytical techniques based on GIS and PaleoGIS tectonic reconstructions, the two were unable to find evidence of extinction due to competition between 10 species of marine vertebrates from the Late Cretaceous North American Western Interior Seaway. They suggest that the driving force behind evolution is "likely to be abiotic environmental factors, such as climate and sea-level changes. Other ecological factors may have been important as well."

A Stunning Success

Five of Professor Bruce Lieberman's grad students drew an overflow crowd to a daylong symposium on evolution they organized at the 3rd International Palaeontological Congress in London. The July event put on by Wesley Gapp, Francine Abe, Curtis Congreve, Cori Myers and Erin Saupe was so popular that conference organizers asked the students to pause midday so they could hook up audio and video to allow additional attendees in an overflow room to watch. More than 200 people attended.

Among those who spoke were David Jablonski, a University of Chicago paleontologist who was just inducted into the National Academy of Sciences, and trace fossil pioneer Adolf Seilacher of Yale University and the University of Tübingen. Each member of the Lieberman lab, including Bruce, presented talks on macroevolution. As we go to press, the students are organizing the proceedings into a special volume of the journal *Palaeontology*.

CO_2 Project Drills Down

U.S. Department of Energy funding for a CO_2 sequestration project has just been increased to $10 million. The three-year effort includes faculty and students from the Geology Department, the Kansas Geological Survey and Kansas State University, and partners with 13 private companies.

Led by KGS researchers Lynn Watney and Saibal Bhattacharya, the project is studying the feasibility of storing carbon dioxide underground in Kansas and using it to recover more oil from nearly depleted fields. Two of the deepest wells ever completed in Kansas have already been drilled as part of the project.

"They were drilled all the way down to the 1.5 billion-year-old granite basement," says grad student Aimee Scheffer, who is working on the project. "Most wells in Kansas penetrate into the Mississippian rocks for oil production or into the top of the Arbuckle for disposal wells. We drilled all the way through the almost thousand-foot-thick Arbuckle dolomite. "

Aimee praises Watney and Bhattacharya for allowing her to attend meetings with contractors and learn the "ins and outs of drilling and coring," she says, "I have learned so much."

Kudos

Kathryn Hoffmeister, a sed-strat masters student of Associate Professor Diane Kamola, won the 2010 Ziad Beydoun Memorial Award for best AAPG poster session presented at the AAPG International conference.

Ben Rickards, Professor Don Steeples' student, won the award for the Best Geophysics Poster at the 2011 AAPG/SEG Spring Break Student EXPO in March.

Grad student **Benjamin P. Haring** presented a paper entitled "Mechanisms and Stability of Biogenic Lead Sulfides" at the American Chemical Society at the National Conference in Anaheim, Calif., in March.

Rock Chalk Alumni

Geology alumni, faculty and grad students enjoyed Jayhawk victories at alumni receptions in January, February and March at the J.W. Marriott Hotel in Houston, the Fox & Hound Pub & Grille in Oklahoma City and the Adams Alumni Center in Lawrence. G-Hawkers shared libations, good food and great basketball as they watched KU down K-State, Colorado and Missouri. We are, however, still mourning the outcome of the NCAA tournament.

See You There

The next alumni get together is at the AAPG annual meeting on Tuesday, April 12, 5:30 – 7:30 p.m. in the Hilton Americas Hotel in Houston. The event is scheduled to be in the Ballroom of the Americas F, but don't forget to check your convention program for any changes.

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