

T Tracks



Sam Noble Museum

Spring 2016 Newsletter Vol. 28, No. 1



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Tiny Subjects

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the Philippines



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OUR MISSION

The Sam Noble Museum at the University of Oklahoma inspires minds to understand the world through collection-based research, interpretation and education.

OUR VISION

As one of the finest museums, we are at the heart of our community, collectively working to inspire understanding, appreciation and stewardship of the earth and its peoples.

TRACKS

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"Titanoboa: Monster Snake," Photo by James Di
Loreto, Smithsonian Institution.

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From the Director



Spring at the Sam Noble Museum is always full of exciting, family-friendly programs and events – Spring Break Escape, Eggstravaganza and the Oklahoma Native American Youth Language Fair, plus classes, workshops and new exhibits. It also is a time when school buses line the parking lot and I feel happy that thousands of students have the opportunity to experience their state's natural history museum.

The museum welcomed thousands during Spring Break Escape. This annual program, developed by the museum's education department, was filled with fun learning experiences for all ages. Daily programs throughout the week with the collections staff, special sessions in classrooms and collaborations with other educational organizations from across the state have been shown to be just the spark that can lead a child into a career in science. One of America's greatest zoologists, E. O. Wilson, became an entomologist because of a chance visit to the Smithsonian when he was 10 years old!

Spring continues our tradition of bringing new and exciting exhibits to the community. *Be the Dinosaur*, an interactive, state-of-the-art video game exhibit, showcases life in the Late Cretaceous and invites visitors to "be a dinosaur." Whether you are a child or an adult, being a *Tyrannosaurus Rex* or a *Triceratops* can certainly underscore a visit to the museum's Hall of Ancient Life. The video games are quite realistic. I became rather dizzy while being a *Triceratops* trying to avoid getting eaten by a T. rex. Alas, I was devoured by the predator.

We again welcome collaboration with the University of Oklahoma Libraries History of Science Collections for our second exhibit in conjunction with *Galileo's World: An Exhibition Without Walls*. *Through the Eyes of the Lynx: Galileo and the Microscope* explores the first published observations made with a microscope. It is a fascinating look into the birth of science. I urge you to visit and enjoy both of these exhibits while they are on display.

This spring, we celebrate the 14th anniversary of the Oklahoma Native American Youth Language Fair. This year's theme, "Language Is Our Future," highlights the relationship between the use and preservation of Native American languages as part of the survival of Native American culture into the future. Featured speakers will be Dorothy Whitehorse Laune, a member of the Kiowa Tribe of Oklahoma, and Herman "Mogri" Lookout, Osage, who started learning Osage over 40 years ago. Both of these speakers are supporters and veterans of the language fair, and have served as judges. Last year, the fair had a record 1,100 participants, and registrations this year exceed that, which should make 2016 the largest language fair ever.

In this newsletter, you will read about what the museum is doing to preserve and protect the Oklahoma Collection of Genomic Resources and what two of our curators – Cameron Siler, Ph.D., and Katrina Menard, Ph.D. – are doing in the Philippines. While Menard is halfway around the world, an OU graduate



Above Left: 9-12 grade 1st place winners in 2010 - members of the Shackelford family. Above Right: Bob Rucker and Makaylin and Erika Akins explore different eggs on display during Eggstravaganza.

student working with her in the recent invertebrates collection is surveying ant species across the state. *Reaching Oklahoma* details how the ExplorOlogy® Program extends to middle school and high school students in rural areas and why taking science to the students inspires learning.

Last year was another truly exceptional year for the museum. Following receipt of the National Medal from the Institute for Museum and Library Services and being reaccredited by the American Alliance of Museums in 2014, the Sam Noble Museum became a member of the Excellence Club in 2015.

Excellence Club members such as the British Museum, Casa Batló (Barcelona), Churchill Museum and War Rooms, Canadian Museum of Nature, Museum of London, National Museum of Ireland, National Museum of Scotland, New Acropolis Museum (Athens), Victoria and Albert Museum, and other museums and heritage and conservation projects that have been presented at the Best in Heritage conference in Dubrovnik, Croatia. We were brought to the attention of the European Heritage Association because of having won the National Medal, and were one of only two U.S. museums selected to participate in Dubrovnik last September.

Being recognized nationally in 2014 for extraordinary service that makes a difference in the lives of individuals and families, and then internationally in 2015 as a member of the Excellence Club for the outstanding quality of our achievements, have been some of the greatest honors for the museum and for me as director. My hope is that we will continue to grow with your support and the support of the University of Oklahoma and the state of Oklahoma. You should take great pride in your natural history museum, which has made a long journey from being the Stovall Museum, hidden away in barns and stables, to being a leader among university natural history museums worldwide.

I hope you have a great summer and are able to visit your outstanding museum.

M. Mares

Michael A. Mares, Ph.D.
Director



Above: Students from Arthur Elementary School in Oklahoma City pose beside the museum's outreach van.

Reaching Oklahoma

BY ELYSSA MANN, PUBLIC RELATIONS

Seventh-grade students from Thomas High School in Thomas, Oklahoma filed into David Hagny's first-hour science class, excited over the specimens (birds, frogs, a mouse and more) lined up at the front table. Today was special — the Sam Noble Oklahoma Museum of Natural History had come to visit.

As part of the ExplorOlogy® Program sponsored by the museum and the Oklahoma Energy Resources Board (OERB), ExplorOlogy® in Motion travels to classrooms and schools across Oklahoma to provide hands-on, inquiry science experiences to K-12 students and teachers.

Josie Wagoner Garrard, the museum's outreach education coordinator, facilitates the program. She visits the schools of Paleo Expedition, Oklahoma Science Adventure and Science Institute "graduates", giving them the opportunity to share the science they experienced in the field with their friends and peers in the classrooms.

At Thomas High School, she spent the day leading middle and high school students through the "Classify It!" program, which introduces them to the topic of classification. They learned how and why scientists classify animals and other creatures (like insects) into different categories, such as phylum, genera and species.

After breaking into groups, each set of students received either a set of mammals, birds, insects, reptiles or amphibians and were instructed to sort the specimens into increasingly more specific categories. They examined physical features, such as number of legs, presence or lack of wings and type of fur, when deciding how to classify each specimen.

Wagoner Garrard brings a diversity of items from the education department's teaching collection. When learning to classify specimens, the students can handle and examine them, bringing them eye-to-eye with materials just like the ones scientists at the museum use.

She also brings supplies for a "Touch the Museum" mobile exhibit, which is located in an area where other classes are able to access it all day. Even more specimens, including a large bison skull, are displayed in the exhibit for students to view and touch, making it possible for the entire school to share in the outreach experience.

"It's such a great program," said Hagny, who teaches seventh-grade physical science, ninth-grade biology and kindergarten physical education. "The kids get to experience something they wouldn't usually be able to during a normal school day."

In a state ranked "far below average" in preparing students for pursuing a career in science, ExplorOlogy® was started to help

meet the need. Rural areas with small economically challenged schools often lack the resources to encourage their students to seek careers in science. Teachers lack the time and training to teach more science classes to excite students to the wonders of science.

Providing authentic STEM (Science, Technology, Engineering and Mathematics) learning experiences to Oklahoma students and teachers is critical to fostering scientific awareness and understanding of our natural world. As the state's natural history museum, the Sam Noble Museum has always had public education as a core mission.

ExplorOlogy® in Motion is designed to provide outreach to students across the entire state. It offers them a hands-on experience that familiarize them with the methods of science, engages them in the process of doing science, teaches them how to think like scientists and to become aware of the remarkable choices and excitement of careers in science.

Later in the day at Thomas High School, while teaching the program to a class of freshmen, Wagoner Garrard summed up the importance of science in people's everyday lives. "You are practicing science every day, whether you realize it or not. From the time you wake up until you fall asleep, science is touching your lives through the weather, clothes you wear, food you eat, music you listen to and the smart phones you have in your pocket."

"ExplorOlogy® in Motion is an outreach program designed to help demystify science. Once students take part in the process and understand how scientists find out the answers to questions, we often find that they have increased confidence in themselves and their ability to do science," said Jes Cole, head of education.

"We want to create interest in science," she said. "People can sometimes be intimidated by science, and many students only have access to a few science classes. When we visit classrooms around Oklahoma, we want to ignite passion, understanding, interest and awareness and inspire a population of students who want to engage in science."

"We teach in a way that kids are able to take the knowledge they receive during the visit and apply it to other concepts," Cole added. "In a state where there's a need for people in STEM fields, we want to create experiences in those areas in any way we can."



Above: Exploring actual museum specimens, a student compares the features of different Oklahoma animals.

About ExplorOlogy®

ExplorOlogy® is a series of programs designed for Oklahomans to "do science" by getting outside and experiencing the world we share. ExplorOlogy® makes science exciting and relevant to Oklahoma youth by engaging them in authentic science experiences

ExplorOlogy® was created in 2007 as a joint effort by the Sam Noble Museum and the Whitten-Newman Foundation to introduce young people in Oklahoma to science. In the first five years, more than 50,000 school children experienced field-based research provided by a grant from the Whitten-Newman Foundation.

In 2015, ExplorOlogy® was sponsored by Oklahoma's oil and natural gas producers and royalty owners, through the Oklahoma Energy Resources Board (OERB). The OERB provides energy-related, hands-on curricula for K-12th grade students and free workshops throughout the state, where teachers receive a curriculum guide, an activities kit, a \$50 stipend and professional development hours for attending. There are eight curricula that meet the Oklahoma Academic Standards and are endorsed by the Oklahoma State Department of Education. The OERB also provides educators with free field trips, safety materials and in-class presentations. More information about the OERB's student education efforts can be found on OERBHomeRoom.com.

Big Research, Tiny Subjects

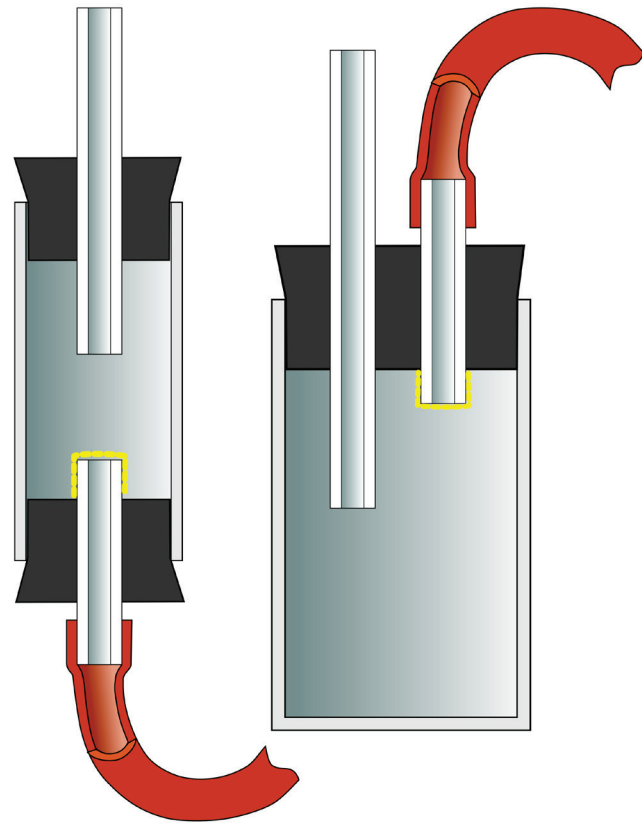
BY ELYSSA MANN, PUBLIC RELATIONS

More than 12,000 ant species exist in the world. Of those, over 1,000 are found on the North American continent. And of those, 84 species are recorded in the state of Oklahoma. But, researchers think that number should be higher.

According to Karl Roeder, a graduate student in the biology department at the University of Oklahoma working in the Sam Noble Museum's recent invertebrates collection with curator Katrina Menard, Ph.D., five or fewer species of ant have been recorded from most counties in the state. For some counties, no species of ant is present in a museum collection. In fact, in 66 percent of Oklahoma's 77 counties, 10 or fewer species are known. In comparison, Oklahoma's neighboring states have reported far more species — Missouri has 144, Kansas has 127 and Colorado has 226 — the state's biological record for ants and other species is lacking.

"There's definitely a larger number of species recorded around Norman and Stillwater because OU and OSU professors and researchers often take their classes out to survey the area," Roeder said. "But there are huge gaps in data in more rural areas."

Considering Oklahoma's 11 diverse ecoregions, which are more than any U.S. state, Roeder knows there are far more species out there. "I wouldn't be surprised at all if there were more than 200 species in Oklahoma," Roeder said.



Above: Pictured above, an aspirator, a device used in collecting small specimens, such as ants, in the field. Image courtesy of Alexei Kouprianov, 2007.

Roeder plans to survey for ant species county by county. To date, he has collected at least 40 species of ants and discovered a genus of ant that was previously unrecorded for the state of Oklahoma, though there are records of it in surrounding states. In Comanche County alone, Roeder and his team have recorded 47 species of ants — the highest number of recorded species for any county in the state. He and his team also have surveyed both Marshall and Cleveland counties.

It may not seem like surveying for species of ants or other animals and plants across the state is of the utmost importance to the science community. However, Roeder stressed the significance of creating a baseline data set that provides information on distribution and natural history that can be used to stimulate future research.

“We’ve already made some great finds,” Roeder said, adding that he expects his team will most likely find several previously unrecorded species for the state, and will probably find a few more genera as well.

Once the results of surveys such as his are published, Roeder says people start to get excited about the research. “People don’t always see the purpose, but they start to get excited when they actually see the biodiversity,” he said. “Once they get a copy of the photos and the paper, they get really excited that, for example, there are subterranean armies of ants that attack each other’s nests. The idea of species like that being in the United States is really cool to people.”

Collecting specimens isn’t always easy. When dealing with creatures as small as ants, Roeder and his team have four options. One entails using a special, long-stemmed tweezer-like tool. Another involves sucking the ants up with a tube using suction from his own mouth (with a special filter in the tube to prevent the ants from getting sucked into his mouth); for this, he uses a device called an aspirator. Other options are ‘pitfall trapping’, in which Roeder or one of his colleagues sets a tube in a hole in the ground and waits to see what falls into it, or he marks off a square meter of land and sifts through the dirt with a sieve.

According to Roeder, ‘pitfall trapping’ is the easiest and most convenient method. It allows a lot of specimens to be collected at once and the device can be left overnight to collect ants that prefer cooler temperatures.

Considering that his research involves an insect most people associate with summer picnics and blazing-hot summer temperatures, one could easily assume that Roeder’s collection time would be cut short by the arrival of fall and winter. He says, luckily, that’s not the case since he’s able to pitfall trap, sift and tweeze all year long.

“Most species are active in spring to fall,” he said, “but there’s one species in Oklahoma, called the winter ant,

that likes colder temperatures. We may also find others that like cooler temperatures that just haven’t been recorded yet.”

All of Roeder’s work will be immortalized through the museum’s recent invertebrates collection. He is depositing all of his specimens into the collection.

“That way, they’ll always be here for future generations,” he explained.

Roeder will complete his official work with the museum at the end of 2016, but plans to continue his project for years to come. “There’s been a lot of talk about the effects of climate change,” Roeder said. “Oklahoma is an interesting place where you can already see these effects. To understand future impact on ant species in our state, we need to know what’s there now so we can monitor any change.”

Below: “Myrmecia”, head detail. Image taken in bushland surrounding Swifts Creek in Victoria, Australia. Fir0002/Flagstaffphotos, 2007.



Be the Dinosaur: Life in the Cretaceous

BY ELYSSA MANN, PUBLIC RELATIONS

Children today have never known a world without Xboxes, PlayStations or Wiis. Their lives have been filled with video games since birth. So how do you bring an enriching educational experience to children that taps into one of their favorite forms of entertainment? You bring them *Be the Dinosaur*.

Cutting-edge and educational, the *Be the Dinosaur* exhibit brings to life one of the world's most extensive restorations of an extinct ecosystem ever created in an interactive video. Visitors can sit down at a simulator pod and explore what a day in the life of a *Tyrannosaurus rex* or *Triceratops prorsus* may have actually been like in their world over 65 million years ago.

A product of over five years of work by world-class paleontologists and exhibit designers, *Be the Dinosaur* is an inquiry-based exploration of the twilight age of the dinosaurs. This innovative exhibit lets the visitor experience what it was like to BE a dinosaur. Based on fossil evidence of flora and fauna believed to have co-existed in the Late Cretaceous, one can choose whether to become a carnivore or an herbivore and embark upon an adventure of learning.

State of the art imaging systems deliver an exclusive high definition video and audio experience for all ages. Simulator pods are securely networked together with easy access for young visitors and visitors with disabilities.

"Our visitors expect sensory engagement," said museum director Michael Mares. "Many of our exhibits incorporate video technology, sounds and even motion. *Be the Dinosaur* takes it one step further by allowing visitors to

engage with each other virtually while learning about ancient ecosystems and animal behaviors."

The gallery is filled with information pillars and a field station that discuss major areas of science relating to dinosaurs and their ecosystems. Questions such as, "Do I live alone or in groups?" "How do I stay healthy?" and more equip visitors with the tools they need to survive in the Late Cretaceous simulators.

After gathering information, guests are ready to face the world of the Late Cretaceous and attempt to survive as a dinosaur. Immersed in the dinosaurs' world and armed with knowledge, patrons pick up scents, track prey and search for water in order to survive. But surviving in the Late Cretaceous isn't as easy as it sounds.

Perils lurk behind every tree, and one wrong move of the joystick could spell the end. Even family and friends are a danger. Given that all of the pods are connected into the same Late Cretaceous world, a particularly competitive friend playing a *Tyrannosaurus rex* could end the adventure for another playing as a *Triceratops*.

In addition to the pods and field station, the exhibit also includes a full scale *T. rex* head that is a 3-dimensional recreation of the star of the *Be the Dinosaur* simulation, a life-sized fossil cast of a *T. rex* head and a Safari Jeep that takes younger visitors on a narrated 'tour.'

Be the Dinosaur is on display through June 12 and is sponsored by Love's Travel Stops and Country Stores.



Upcoming Events:

Lecture by renowned paleontologist, Paul Sereno
"Cold Case File: Dinosaur Bombed Then Stolen"

Dinosaurs, Past and Present Lecture Series

Saturday, April 16

5:30 p.m. Dessert Reception

6 p.m. Lecture

Complimentary admission.

Adult Trivia Night

Friday, May 6

7 p.m. Reception

8-10 p.m. Trivia

Pre-registration required. Call (405) 325-1008.

Photo: "Be the Dinosaur" exhibit, Eureka Exhibits, LLC.

Through the Eyes of the Lynx: Galileo and the Microscope

BY ELYSSA MANN, PUBLIC RELATIONS

Top right: *Micrographia nova*, "The New Micrographia," Johann Franz Grienel, 1687.

Below: 18th century Culpeper microscope.



The *Apiarium*, published in 1625, details the anatomy of the bee as recorded by Francesco Stelluti and Federigo Cesi. They, like Galileo, were members of The Academy of the Lynx. One of only six known copies, it is the centerpiece of *Through the Eyes of the Lynx: Galileo and the Microscope* on display through Aug. 31 in the Dorothy C. Higginbotham Special Exhibitions Gallery, as part of the University of Oklahoma's *Galileo's World* exhibition.

The *Apiarium* is a poster-sized work created by Stelluti and Cesi after using Galileo's "new instrument," which we know today as the microscope, named by Galileo's colleague Johann Faber.

According to Galileo, his creation was a "telescope accommodated for viewing things very close." Using Galileo's creation, Stelluti and Cesi were able to view the bee more closely than any other person had before. Once published, the *Apiarium* became the first work to contain observations made by using a microscope. Of note, Galileo's work *Sidereus nuncius* (1610) was the first work to contain observations made using a telescope.

"Today the microscope is an integral part of the research conducted in our collections, which is why this exhibit is such a perfect fit for the museum," said museum spokesperson Jen Tregarthen.

In addition to the *Apiarium*, the exhibit features a replica of a microscope quite like the one originally created by Galileo and one of his contemporaries, Giuseppe Campani. Other printed works written by members of The Academy of the Lynx on display include *Persio* (1630) by Francesco Stelluti, *Arcana naturae* (1695) by Antonio van Leeuwenhoek, *Flora; overo, Cultura di Fiori* (1638) and *Flora, seu, De florum cultura* (1664) by Giovanni Battista Ferrari, and *Micrographia* (1665) by Robert Hooke.

Through the Eyes of the Lynx: Galileo and the Microscope is the museum's second exhibit featured in the *Galileo's World* exhibition. The first, *Through the Eyes of the Lynx: Galileo, Natural History and the Americas*, spotlighted the work of Francisco Hernandez, who compiled Native American plant and animal knowledge in the New World. Both exhibits were part of a yearlong series of exhibitions, events and programs, *Galileo's World: An Exhibition without Walls* at seven locations across the three University of Oklahoma campuses.

Collection Receives Deep Freeze Upgrade

BY ELYSSA MANN, PUBLIC RELATIONS

Though it was only established in late 2006, the Sam Noble Museum's Oklahoma Collection of Genetic Resources already houses nearly 37,000 vials of tissue samples. These samples presently represent 40 different orders, 151 families, 421 genera, 732 species and 14,000 individuals. Established by head curator Janet Braun, Ph.D., with the support of the Sam Noble Museum and the University of Oklahoma Vice President for Research, the collection was created to serve as a source of genetic material for biodiversity research to be used by the scientific community in Oklahoma and around the world.

"The collection has grown from the work of curators, graduate and undergraduate students, research associates and colleagues," Braun said. "It contains the largest collection of tissue samples of vertebrates from Oklahoma, mammals from Tennessee and amphibians from Arkansas. It also is important in that the second largest collection of tissues from Argentine mammals is preserved in the collection. In the coming years, it will be significant for its holdings of organisms from Southeast Asia and the Neotropics."

The collection is currently housed in mechanical freezers that store the samples at minus 80 degrees Celsius. Although minus 80 degrees Celsius freezers are widely used for the storage of genetic resources, it is now known that to prevent long-term degradation, samples must be kept below minus 130 degrees Celsius to prevent degradation. To solve this problem, Braun, curator Cameron Siler, Ph.D. and curatorial associate Brandi Coyner, Ph.D., applied for a grant from the Institute of Museum and Library Services (IMLS) and received \$128,863. The grant

funds will be used to replace the current freezers with a storage system that uses liquid nitrogen, which will sustain temperatures of minus 150 degrees Celsius, easily preserving the samples long into the future.

Moving to the new storage system will also keep the collection safe in an emergency that causes the power to go out, such as a tornado or severe storm. The liquid nitrogen storage system does not rely on electricity and can hold temperatures above critical levels for 26 days. Even in the case of long-term electrical failure, the collection will remain safe.

"One of the most challenging collections that any museum preserves is one of frozen tissues," Braun said. "This is probably the most significant grant for collection preservation that I have received during my 30 years with the museum. With funding from the IMLS, the museum will provide for the long-term safety and security of the collection for decades."

The new system will also ensure that the collection will have adequate room to grow in the coming years. Currently, the freezers are at 70 percent capacity, and based on a projected growth rate, were due to reach capacity in a few years.

Work on installation for the new storage system began in October 2015 and will be completed in January 2017. Over the following 20 months, the samples will be transferred into the new storage system. Undergraduate students, an integral part of the research and curatorial mission of the museum, will actively participate in the project through cataloguing specimens and aiding in the transfer of samples into the new storage system.

Oklahoma Meets the Philippines

BY ELYSSA MANN, PUBLIC RELATIONS



Above: Siler and Philippine field staff.

There are some places in this world many of us can only dream of — the vast expanse of the Sahara Desert, the meandering Amazon River or the snowy peaks of the Himalayas. But on a research trip led by herpetology curator Cameron Siler, Ph.D., scientists will be exploring locations just like that but in the rainforests of the Philippines. He, along with other herpetologists and recent invertebrates curator Katrina Menard, Ph.D., will be conducting research in Luzon, one of the largest islands of the Philippines, and Pollilo, a smaller island a short distance from Luzon.

Due to the country's vast biological diversity and lack of research efforts, the existence of many species have gone unreported, which, for many scientists like Siler, makes the Philippine islands ideal for research.

Siler was studying amphibians and reptiles from the Philippines as a graduate student at the University of

Kansas when he was inspired by trips his advisor led to the country's various islands.

"I fell in love with the idea of going to the Philippines. There's always so much to discover," he said.

Siler now has more than a decade of research focused on documenting Philippine species with fellow researchers.

One of the main points of interests during this year's excursion is a type of burrowing lizard called the Philippine slender skink.

"The major body forms of species in this group of lizards vary greatly," Siler said. "The numbers of fingers and toes differ from species to species, and in at least four instances, species have lost their limbs completely and look more like snakes than what we think of typically as a lizard. We want to learn why this peculiar group of lizards has evolved this way, as well as how these body differences develop and function."



Above: Siler, Samar Island, Philippines in 2014.

Most groups of lizards on our planet show a single type of body form — commonly four limbs, each with five digits (fingers or toes). However, in the case of the Philippine slender skinks, a single group of lizards exhibit an incredible amount of variation in body form among living species in different geographic regions of the country. Siler and his colleagues, through field experiments and on-site studies, want to explore the processes behind this unique pattern.

In addition to work with amphibians and reptiles, Siler has also collected a variety of vertebrate and invertebrate species for fellow scientists back home in the United States.

He's brought back a variety of insects for Menard and the museum's recent invertebrates collection. This time, however, Menard will be along for the fieldwork.

"Cameron always brought back a lot of diverse specimens," Menard said. "And so much of science is collaborative, so it will be amazing to go myself."

According to Menard, collecting specimens in the field and observing the insects in their natural environment is an integral part of biological research.

"When you see where they [insects] live, you understand why there's so much diversity," Menard said. "It's so exciting — like opening a box of candy — getting to see them in their natural environment."

Specimens from the Philippines are hard to come by in the United States, which makes this research trip all the more important to both researchers.

"Unlike many other institutions, we have the unique ability to catalogue and make information about specimens from trips available relatively quickly," Menard said. "We're able to get the information online for scientists around the world to use, which makes us special. It's important to us to be a global leader in partnership with the Philippines on this work and we hope to have a good working relationship with the country as the future progresses."

In addition to field research and specimen collection, this trip will also provide an opportunity to expand the museum's genetic resources collection through the deposition of tissue samples from specimens that are collected in the field.

Siler's research trip is funded by a grant from the National Science Foundation. Siler, Menard and associates left for Luzon and Pollilo in February and will return in March. Siler also plans to make two more trips to the Philippines this year. Menard will be using her experience and data collected on her first trip to apply for National Science Foundation grants to further study and explore invertebrates.



Sam Noble Museum

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Coming Soon!

Titanoboa: Monster Snake

Saturday, July 2 through Sunday, Sept. 25