3-2018

Life Line March 2018

Otterbein University

Life Line

Volume 19 | Published by Otterbein University Department of Biology and Earth Science | March 2018

Welcome Spring 2018

Welcome to another edition of our annual newsletter! You'll see that a lot of exciting things have been happening over the last year, including the addition of a new faculty member, Dr. Andrew Calinger-Yoak. Andrew joined us in fall 2017 and has been teaching many of the nursing-facing courses like Anatomy & Physiology and Pathophysiology. He has a B.S. in Zoology and a Ph.D. in Evolution, Ecology, and Organismal Biology from The Ohio State University. After graduating, he spent several years as a post-doctoral researcher in the Department of Preventive Veterinary Medicine at OSU working directly with the USDA and CDC.

His research interests include computer modeling of disease, skeletal articulation of museum specimens and raccoon research, however, he's spent most of his time working internationally on managing free-roaming dog populations in places like India, Ethiopia, and the Galapagos Islands. Andrew is really excited about involving Otterbein students with his work and sharing his passion for science.

He's a long-time resident of central Ohio and lives with his wife and three young children in addition to their ever-growing menagerie of animals. We are so happy to have him on our team and know you will be hearing more about his great work with our students in future newsletters.

Andrew Calinger-Yoak

Dr. Sarah Bouchard,
Professor and Chairperson

Underwater University

The Department of Biology and Earth Science's zoo program has been so successful, that we have decided to expand in a new direction. Starting this fall, students can choose to pursue the "Aquarium Track" within the Zoo Science major. The *Columbus Dispatch* story on our new program gave us the headline "Underwater U". While the goals of the track remain focused on the science and practices of animals in captivity, the new path allows students to focus on aquatic biology and aquarium specific practices. Dr. Michael Hoggarth will be developing a new course on freshwater biology to complement Dr. Halard Lescinsky's existing coral reef ecology course and a new introduction to marine science course will be offered. One key to the new offerings will be a practicum course designed specifically on tank upkeep ("life support"). The practicum will be offered in conjunction with our partners - the Columbus Zoo and Aquarium and Reef Systems Coral Farm of New Albany. In addition, much of the lab in room 113 will be retrofitted to house a series of new marine tanks for students to hone their aquatic husbandry skills. We hope the program's new focus will allow us to add 10-12 new students to the major each year.

Claire Sinard '19 interning at the Discovery Reef, Columbus Zoo and Aquarium

Otterbein's Well Field Goes Off the Grid and Gets an Outdoor Laboratory

Environmental science students are familiar with the monitoring well network behind The Point (60 Collegeview), and now thanks to a generous donation from Alan Goff '75 and Coral Harris, a solar powered pumping system and an outdoor laboratory will be constructed as part of the improvements and renovations to the former Mettler-Toledo building. Both the pumping system and the outdoor laboratory are currently under construction.

Goff and Harris cited a concern related to global warming, water scarcity and a disappearance of arable land as the motivation for their $100,000 Innovative Sustainability Fund. The couple are proudly sponsoring the development of a solar powered water supply system that will be integrated with a water feature to be developed by the Department of Art. Their donation will be used to drill a 25-foot deep water well, purchase a submersible water pump and solar panels that will supply the electricity for the system, and support materials for the development of the water feature. The intent is to train students how water supplies can be developed in areas that do not have access to electricity.

The solar powered pumping system that will be installed at The Point.

Dr. Kevin Svitana is incorporating the well development and pumping system installation into his hydrology class, ESCI 3100. Students will do hydraulic analysis of the aquifer to determine the sizing of the pumping system, work with Dr. Svitana to install the pump and solar panels and learn how to perform maintenance on the system. "This is an excellent opportunity to provide students with first-hand experience with developing an off-grid water supply system. We really appreciate what Alan and Coral have done," stated Svitana.

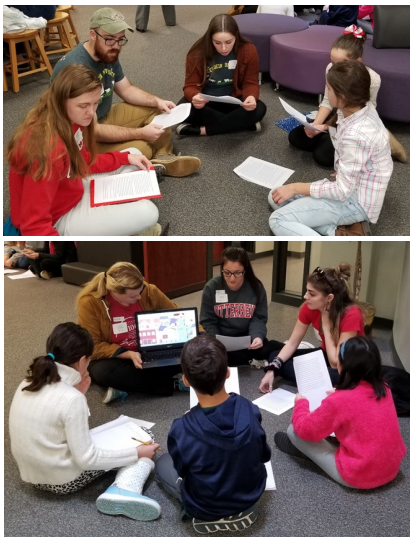
The outdoor laboratory will be a covered area behind The Point that will have sinks, storage and workspace for both Biology and Earth Science classes. Thanks to the generous donation, students will be able to work in the field, rather than transport everything back to the Science Center. Drs. Bouchard, Hoggarth, Lehman and Svitana envision using this facility to help add to curricular opportunities related to field laboratory exercises.

Conservation Biology Storytelling

Students in the fall 2017 Conservation Biology class focused on how to use storytelling to inspire people to help protect the environment and endangered species. Everyone took an online storytelling course produced by the International Union for the Conservation of Nature (IUCN). The course, *Storytelling for Conservation Action*, contained five main units entitled: (1) Designing your stories; (2) Developing your own nature conservation story; (3) How to use the power of storytelling; (4) Joining IUCN CEC's campaign "How to Tell a Love Story"; and (5) The power of storytelling.

After completing the course, students worked in groups to write their own stories, one aimed at college students and one aimed at fifth graders. Terry Hermsen from the Otterbein Department of English and Beth Armstrong from Conservation Initiatives visited our class to talk about their experiences telling stories and to offer some helpful pointers. We also tapped into the expertise of Jenny Currier, freelance journalist, and Kyle Huetter, Education Manager from The Walt Disney Company, by skyping them into our classroom. The students worked hard all semester with many ups and downs and multiple drafts of each version. Stories focused on a wide variety of environmental problems, including how palm oil production and cell phone manufacturing are directly tied to deforestation, the causes and consequences of native bee population decline and connections between the fashion industry and environmental pollutants (among many others). Each story worked hard to hook the reader into caring about these environmental issues and offered concrete solutions.

We wrapped up the semester by traveling to Glacier Ridge Elementary School, where the students shared their stories with Allison Lodico's fifth grade class, which was also studying conservation. Otterbein students served as experts in their area and after they read their stories to the fifth graders, the children interviewed them. The interviews were one of several sources that the fifth graders used to write their own essays. Although many of the Conservation Biology students were nervous about the experience, it was highly successful and very rewarding for everyone.



Storytelling at Glacier Ridge Elementary School

Safari in South Africa *By Kyle Turner '19 and Rachel Wilson '19*

This summer a group of students in the Otterbein Biology and Earth Science Department traveled to South Africa to study large animal ecology. The trip was led by Dr. Halard Lescinsky and Dr. Beaux Berkeley with the hopes of engaging their students with higher level thinking in new situations. Overall we visited more than a dozen different places in a span of 14 days and countless memories were made.

Our first full day in the country was spent exploring the city. We visited several places that were unlike those we had ever seen before. Visiting Soweto was an eye-opening experience to how people around the world live and how material items and money don't always mean happiness. We learned a lot about the history of South Africa, the importance of Nelson Mandela and even visited the Apartheid Museum. Seeing another culture first hand really put into perspective the issues we have here in the United States.

After our humbling journey through Johannesburg and Soweto we ventured to the Conservation Academy and found ourselves immersed in the surroundings. With no connection to our phones, we were fully focused on our experience. We were greeted by our host, Wayne, and his wife. They welcomed us to stay in dormitories and fed us wonderful cuisine. The milk we had was from a neighboring farm, most of the food was locally sourced and we got to see what it took to live in the country side in South Africa. At the Conservation Academy we learned about land management and we had the opportunity to hike the surrounding hills to learn about the plant life around the property.

From the academy we visited different parks. Some being: Addo National Elephant Park, Amakhala Reserve and Cango Wildlife Ranch. We also visited sanctuaries including Monkeyland and Birds of Eden and went on an early morning expedition with Meerkat Adventures. We got to see different animals including the small flightless dung beetle to some as large as a bull elephant. Our group ended every day with exciting stories of what we saw and experienced.

Once our first two legs of the trip were over, we jumped on another plane and flew across the country to the Eastern Cape and drove to Mossel Bay. There we stayed with Oceans Research and ventured out to different locations to learn and help in research. We assisted in great white shark surveys and benthic shark tagging. We also got to see humpback dolphins, cape seals and a wright whale and her calf. After we had our fun in the water we jumped on yet another plane and headed to the most anticipated part of our journey: Kruger National Park.

We ended our adventure spending a few nights camping in Kruger National Park and spent our time going on game drives at all hours of the day. Amazing animals including elephants, lions, giraffe, kudu and several other phenomenal creatures crossed our path and our photo lenses. We were awe-struck by everything around us, including the power and size of the African sun. We are so grateful to have been able to complete this journey and given the chance for such an amazing experience.

Kyle Turner '19 and Allyssa Carmona '20 tagging a baby pajama shark.

Meerkats at Meerkat Adventures, Oudtshoorn

"Beware of Lions" at Addo. Left to Right: Kyle Turner '19, Rachel Wilson '19, Gracyn Graley '20, Josie Miracle

Students Construct New Compost Bins

Zoo and Conservation Science students Chelsea West '20, Julie Platz '20 and Mallory Fox '20 show off the new compost bins they constructed. This was a project for their second year practicum at the Ohio Wildlife Center. Students volunteer four hours a week during the semester to gain experience in wildlife education and rehabilitation.

Scholars from Chengdu Panda Base Visit Otterbein

In October of 2017, we were proud to host two guests from the Chengdu Base of Giant Panda Breeding, Dr. Liu and Mr. Huang. Otterbein's Zoo and Conservation Science program has a partnership with the panda base that allows us to send two students there every summer to conduct research on giant panda cub behavior. The panda base sent staff to Otterbein to learn more about Zoo and Conservation Science in America as well as standards and practices of animal veterinary care here. Dr. Liu and Mr. Huang were able to sit in on several Otterbein classes including Conservation Biology and Zoo Animal Training and Enrichment, as well as make site visits around Ohio. They fed a hippo at the Toledo Zoo, shadowed vets at the Ohio Wildlife Center, observed semen collection from an immobilized rhino at The Wilds, got a behind-the-scenes tour of the Columbus Zoo and saw Fiona the hippo at the Cincinnati Zoo. They also experienced an American Halloween and Thanksgiving, and were able to connect with other visiting Chinese scholars on campus.

(L-R) Dr. Burk, Mr. Huang, Dr. Liu, Dr. Bouchard, Dean Eisenstein, Dr. Lescinsky, and Dr. Young

The Virtual World of the Cell *By Dr. Jennifer Bennett*

It is an exciting time at Otterbein for new innovations in science and technology. In collaboration with Colin Saunders from the Center for Teaching and Learning and Erin Bender at The Point (Otterbein's new STEAM Center), I decided to introduce virtual reality (VR) into my cell biology course. This is the first time that VR has been used at Otterbein in the classroom and this was my first venture into this technology. I was able to try it after a meeting one day and immediately knew it would have a tremendous impact in my classroom. I brought all three of my lab sections (a total of 67 students) to The Point, and the students took a "journey" through the cell using this technology. For most students, this was their first experience with virtual reality. A small number of students were previously exposed to VR, but this was a more graphic and immersive version than they had ever experienced. I was hoping that the students would be just as enthused about VR as I was. The verdict: the students loved it!

Cell biology is a challenging course for many students and this is greatly influenced by the fact that the cell is so tiny that the parts cannot be viewed in a typical light microscope. Therefore, the concepts are abstract and hard to visualize. VR gives students the ability to travel inside the cell and even "handle" organelles that are only one micron or 10^{-6} m long. They even experienced a viral assault on the cell and were able to blast the incoming virus particles with antibodies. VR allows college students to "shrink" and fit inside the cell, and feel like they are really there, much like they are on a real "magic school bus".

The students followed their VR journey into the cell with a cell sorting challenge where they worked in teams of two to pair cell parts from the VR experience with the correct labels. Each student was rewarded with a sweet treat of M&Ms or Skittles for their participation and the fastest matching team in each lab section was awarded a 2018 Cell Challenge trophy made by engineering students at The Point. It was a fun learning experience that I plan to continue each year. It certainly felt good to hear positive comments from students, including Bri Wallis '19 who e-mailed "I really, really enjoyed the lab today! Definitely inspired my interest in cells being so close to them!" I believe that this is just the beginning of what VR will be able to bring to the classroom and I am enthusiastic about the future possibilities.

Students from the cell biology course take a "Virtual Tour of the Cell" and participate in a cell sorting challenge at The Point.

Congratulations, Professor Dave! *By Dr. Jeffrey Lehman*

Congratulations to alumnus David Kimberly '06 on his position as Assistant Professor of Biology at Westminster College (Salt Lake City, Utah). Dave graduated with a B.A. in Environmental Science from Otterbein after a childhood of "running through caves and streams as a kid and well into high school". Dave states, "The joy I get every day from running out in the wilderness and looking under rocks makes me think there is no other path I could have taken". After Otterbein, Dave attended the University of Texas (Tyler) to pursue a masters in biology. There he researched the effects of mercury exposure on the behavior of cottonmouths.

After graduating in 2008, he took a year off from school to conduct pesticide exposure trials on ornamental and crop plants. In 2009, he started a Ph.D. in Environmental Toxicology at Texas Tech University. After finishing his Ph.D. in 2013, Dave worked as an adjunct at Salt Lake Community College and Westminster College before becoming a Visiting Assistant Professor at Westminster in 2015. That next year he was offered the permanent position of Assistant Professor (total dream job for Dave!). Since 2014, he has been doing research with undergraduates on mercury fate and distribution in lizards on Antelope Island (UT), as well as doing surveys of macroinvertebrates in mountain streams. According to Dave, his main goal is to "provide students the skills and experiences to make them happy, critical, compassionate, and productive humans". He states "Otterbein was crucial in my preparation for graduate work. The summers I spent with Dr. Hoggarth "noodling" for freshwater mussels would instill a passion for aquatic systems, but also an interest in the effects of anthropogenic activities. It also taught me about long-term planning and management of people and equipment within field seasons. My amphibian work with Dr. Bouchard taught me the importance of experimental design, sample size, and attention to detail when collecting data. These experiences, among many others, fostered skill-building while helping me form my direction."

One of Dave's fondest memories happened during Dr. Lehman's Costa Rica trip. Dave discovered a brown vine snake while on a hike through the rain forest. Dave recalls "the elation was almost purely my own. Most of the other students were happy to be well beyond arm's length. I remember being so excited to have captured and handled this particular snake because of its beauty and relative difficulty to see and catch. The end of its head is lobe-shaped, almost like a leaf, while its body is long and slender, like that of a vine. It perfectly blends. Its unsuspecting prey, mostly frogs, have little idea they are being stalked until they are consumed."

Dave also remembers experiencing the BriBri Indians of Yorkin while on the Costa Rica trip. He recalls processing chocolate, shooting bow and arrows at cacao fruit, and then eating the flesh around the seeds. "It was so life altering. How could I not come away with my worldview drastically expanded? Not everyone looked like me, acted like me, nor lived like me. What a liberating idea!"

Dave is married to his wonderful wife, Megan, who is a certified nurse midwife at a local hospital. They have a dog, Riley, and a cat, Mimi. Dave loves trial running, skiing, climbing, eating good food and drinking good adult beverages!

Dave swinging through the forests of Costa Rica and experiencing the wildlife.

Dave with wife, Megan, and with American white pelican

Otterbein Chapter of *AED*

This spring will be the first in several years that we will be inducting new members into the National Honor Society ***Alpha Epsilon Delta***. ***AED*** is for students who plan on pursuing a professional health degree following their time at Otterbein - for example: medicine, veterinarian medicine, optometry, dentistry, podiatry, occupational or physical therapy. Although anyone may attend the events AED will be offering on campus, students can only become members if they meet certain GPA criteria and apply to the National AED organization. Members will run the Otterbein Chapter of AED. We are hoping for strong interest, both from current students and our graduates.

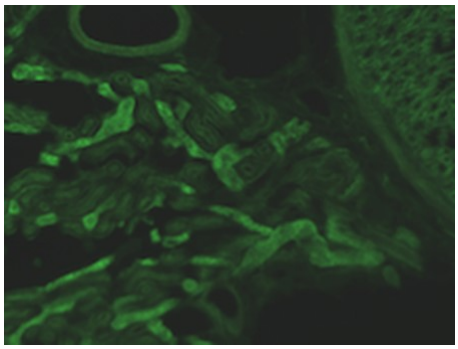
If you are an Otterbein graduate and would like to play a role in helping current students learn more about their chosen field, please contact Lisa Marr M.D. (emarr@otterbein.edu). We are hoping to engage many outside speakers and information events next year!

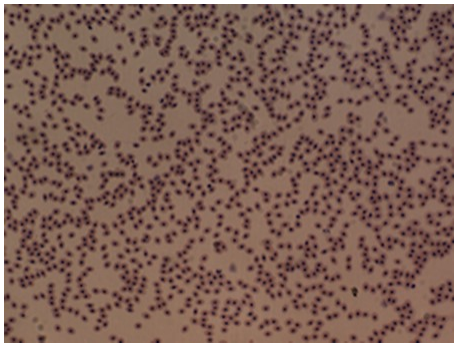
By Lisa Marr M.D.,
Associate Professor

Dr. Sheridan's Lab Builds CardyScope

DIY microscopy. Biologists employ microscopes to study cells and molecules. Different microscopes have variable movable parts to optimize their functionality for specific purposes. For experiments in cellular and molecular neuroscience, an upright, fixed stage microscope facilitates the study of the anatomy and physiology of neurons of the central nervous system. Microscopes from large companies function beautifully, but also come with many extra bells and whistles that do not suit the basic needs of many scientists. These scopes are also very expensive. DIY plans for a new, modular microscope were recently published that instructed scientists how to build a basic microscope out of commercially available products at a significant cost reduction. Last fall Dr. Sheridan's lab acquired components to build a custom, cost effective, modular, upright, fixed stage microscope. Components for this modular microscope were acquired from old, unused microscopes, eBay, commercial vendors, and even some custom pieces from The Point.

This scope, aptly named the *CardyScope*, is now available to other faculty and students that require an upright microscope with fluorescent protein detection capabilities to image their specimens. This new microscope will be used for student research projects in neuroscience and in a "Fundamental Neuroscience" class that is in development. Images produced by Dr. David Sheridan (amphibian blood smear) and Mallory Soska '19 (AlexaFluor 488 in renal tubules and glomeruli of a rodent kidney section) are shown respectively at right.





Mussels and the Removal of the Ballville Dam *By Michael Hoggarth*

This past summer I spent six days salvaging mussels from the former Ballville Dam reservoir on the Sandusky River. I was joined by 29 other people from the city of Fremont (where the dam is located), the USFWS and ODNR, local universities, environmental scientists, and a group of work-release inmates from the county jail. We collected over 11,300 individuals of 16 species, including four species listed as Species of Concern in Ohio (creek heelsplitter, elktoe, purple wartyback, and round pigtoe). We collected live mussels while walking the dewatered reservoir bottom and placed them in buckets and mesh bags. Ultimately, they were all moved to the side of the river where they were identified, counted and placed into coolers for transport upstream to Wolf Creek Park. These specimens were moved to a canoe and then relocated back to the river. Many in the lower portion of the salvage area were found at the end of long trails in a huge, submerged sandbar that had been built there since the dam was constructed and the streambed flooded. It occurred to me later that these mussels had no idea they were living in an atypical environment (a lake-like place) and that once the dam was removed (it will be completely removed in the summer of 2018) this sandbar and the sand and gravel areas upstream within the former dam pool will be no more. The lower Sandusky River is sediment starved and flows mostly over bedrock and boulders. Once the entire dam is removed there will no longer be a way for the river to hold onto these sediments (called a base-level in technical terms) and the sediments will ultimately wash to Sandusky Bay and Lake Erie. It may take a while, but the removal of the dam will ultimately reduce the number of mussels in the river by removing sand and gravel deposits. Still the only good dam, in my opinion, is a former dam, and although we will lose the abundance of habitat we once had, we will reconnect Lake Erie to the lower Sandusky River and allow the river to once again function in species transport within this reach. The relocated mussels may even help repopulate Sandusky Bay and help restore Lake Erie.

Ballville Dam in Fremont, Ohio with a 10 foot by 10 foot notch.

A specimen of the pimpleback (*Quadrula pustulosa*) at the end of a trail. Thousands of mussels were stranded in the sand just like this determined hydrophile.

Securing a Future for Wildlife

My name is Kyle Turner '19, I am a third year Zoo and Conservation Science major at Otterbein. In the summer of 2017 I had the opportunity to intern at the Cleveland Metroparks Zoo in the Conservation and Science Research department. I worked under their Curator of Conservation, Kym Gopp, and their Conservation Engagement Specialist, Emily Baber. I was brought on board to assist them while the Cleveland Metroparks Zoo undergoes a re-branding. The re-branding is focused on highlighting their conservation program: Future For Wildlife. This program has six main conservation efforts: andean bears, asian turtles, giraffes, gorillas, lions and cheetahs, and illegal wildlife trade. I found it quite fascinating how the Cleveland Zoo works with each of these efforts, and loved learning how the Future For Wildlife program brought them to light for a broader audience to see.

During my time at the Cleveland Zoo, I got to see not only how the zoo runs their conservation programs, but many different aspects of how a zoo functions. Fellow student Emily Burland '18 also interned at the Cleveland Zoo. Emily and I were fortunate to be able to attend different sessions for interns around the zoo. One was about the show program where we learned the history and evolution of that program. We also had the pleasure of talking with the director of development, Kim Epley. We learned about her job and how the Zoo works with both the Cleveland Zoo Society and the Metroparks, a very interesting mix. We met with multiple curators of the zoo and also Dr. Chris Kuhar, executive director of Cleveland Metroparks Zoo.

I couldn't resist exploring the Cleveland area!

Emily and I also met with some of the conservation partners. We met Isaac Goldstein, a partner with the Andean Bear Conservation Alliance, Bob Montgomery, a partner for giraffe conservation and the lion and cheetah conservation efforts, and Amy Dickman, a partner of the Ruaha Carnivore Project.

Each one gave a lecture on what they are doing to help support conservation and the connection they had with the Cleveland Metroparks Zoo. Each also has a deep connection with the zoo and were very proud to say that Cleveland was their partner. After the lectures I was fortunate to go to lunch with the partners and it was great getting to talk to them and hear amazing stories of their past and some exciting plans for the future.

I also worked in the office on a handful of projects. Most projects were focused on trying to creating ways to facilitate conservation messaging for the Cleveland Zoo's audience. I created different tools of engagement that I hope can create a valuable learning experience for guests. Emily Burland and I created engagement kits that will help facilitate learning and can be used for the conservation department on or off site. We both also used some of the material we helped create during World Giraffe Day and World Tiger Day, where we worked with Emily Baber at education tables.

Celebrating World Giraffe Day by assisting with activities on the Ben Gogolick Giraffe Deck

One fun bonus for me was that I got to eat lunch with the zoo's veterinarian staff and I learned so much about what they do and what was going on around the zoo with the animals.

This past summer's experience expanded my view on what is possible in the zoo world and it ignited new passion in me. I am excited to go forth with what I learned at the Cleveland Metroparks Zoo, and I hope to return.

Dr. Berkeley Returns to South Africa

Dr. Beaux Berkeley returned to South Africa in December 2017 to complete her study on serum glucose profiles of African elephants fed different diets. She works with the Rory Hensman Conservation Research Unit/Adventures with Elephants in Limpopo, South Africa. They have a herd of seven elephants who, instead of being culled, are used for research, filming and public education. This research was funded by an Otterbein Faculty Scholarship Development award.

Dr. Berkeley was interviewed for a CNN segment "Inside Africa: Saving Elephants by Crossing Borders" - seen here: https://edition.cnn.com/videos/world/2018/02/13/inside-africa-saving-elephants-by-crossing-borders-b.cnn

Introducing Otterbein to Local Schools

Do you remember being an elementary school pupil when a high school or college student would come to your class to promote a drama production, or tell you about an athletic event? Seeing older students gave the visit some "coolness" and earned it some attention. That same "cool factor" is given to science when we take it into local schools.

Otterbein students, faculty and staff have numerous opportunities for outreach in local schools during the year. Whether it is Dr. Lehman or Dr. Lescinsky backing Science Nights for the Big Walnut schools or Dr. Bouchard and the Women in Science Club going to a local Annehurst elementary for their Science Fair Night, we make our Cardinal science presence known. The benefits of supporting STEM in local classrooms are innumerable.

Let me give a rundown of a typical outreach visit: This autumn, I visited Big Walnut Elementary two times for their Eagle Explorers days. Before each trip, I reached out to Biology and Earth Science students to see if anyone would like to assist. I love that there were always volunteers. More than that, I love the enthusiasm of the volunteers. Our students have knowledge to share and the personalities that make them approachable. Molly Kukawka '18 and Amber Wuersig '17 oversaw two stations during one visit and Sean Kirk '18 and Rachel Nguyen '18 presented those two stations to a different group one month later.

Solving the crime of "Who Stole the Queen's Corgi?" using simulated blood typing and simulated genetic analysis gives the elementary students a chance to play detective while associating science with fun and a successful sleuthing experience. In the meantime, the Cardinals hosting the stations get classroom leadership experience and a chance to interact with the scientists of tomorrow. Of all of the ways to use the status of being an accomplished collegiate scientist to influence younger students, sharing enthusiasm for science seems like an admirable option. Maybe we're opening the eyes of a future scientist. Maybe we're opening the eyes of a future academic. Maybe we're opening the eyes of a future Otterbein Biology and Earth Science student. Whatever future dreams we're influencing, we are doing it well! *By Erin Ulrich*

Biology, Chemistry and BMB students at Annehurst Elementary Science Night.

Department of Biology and Earth Science Student Travel Fund

Our department has a new opportunity for students who want to travel as part of their education in biology, environmental science, and zoo and conservation science. This new endowed fund provides support to help with travel expenses. Those expenses can be to study abroad, attend a field station to do research or take a class, or to present at a scientific meeting. Travel to these places can be expensive and it is our hope to be able to help students take care of some of the expenses. Therefore – current students – if your research or education takes you away from campus, just complete the application for summer support and show the travel expenses in your attached budget. Alumni – if travel was an important part of your experience here (travel to a conference to present a paper or travel to another country to take a class or do research), then make a contribution to The Biology and Earth Science Student Travel Fund to help someone else have this kind of meaningful experience!

Endowed Scholars

The Department of Biology and Earth Science is proud of our endowed scholars featured in this issue:

Kyle Turner
The Harriet L. Hays Endowed Scholar

Rachel Wilson
The Otterbein College Memorial Endowed Scholar

Chelsea West
The Annie Upper Endowed Scholar

Julie Platz
The Rike Family Foundation Endowed Scholar

Mallory Fox
The Albright-McCabe Memorial Endowed Scholar

OTTERBEIN UNIVERSITY
Department of Biology and Earth Science
1 S. Grove St.
Westerville, OH 43081
Phone: 614-823-1517
E-mail: drhodeback@otterbein.edu