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DEPARTMENT OF BIOLOGY NEWSLETTER

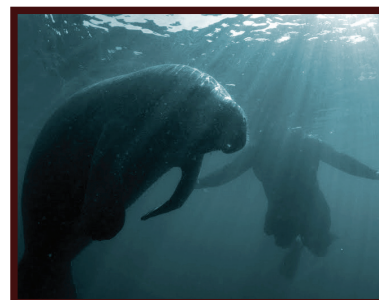
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MARINE BIOLOGY AND ORNITHOLOGY

by Jared Littlejohn

THIS PAST JANUARY, THE BIOLOGY Department offered two new courses during the Winter term, marine biology and ornithology. These courses sparked excitement among biology students, including the nine who enrolled in these companion courses. Dr. Andy Madison, associate professor of biology, led the ornithology course and Dr. James Kerfoot, assistant professor of biology, led the marine biology course. The students spent two weeks in the classroom learning through a series of alternating lectures from each instructor. The courses culminated with a 2-week road trip along the East coast of Florida and Georgia to learn hands-on what had been covered in class. While on the trip, these students were able to investigate and discover the numerous flora and fauna associated with coastal marshes, lagoons, dune communities and beaches. Some of the locations that were visited on the trip included the Okefenokee Swamp and Jekyll Island in Georgia and Melbourne, Florida. Throughout the course, the students were able to study

approximately 130 species of birds. A portion of the ornithology labs were held in West Tennessee as students had the opportunity to observe the abundant waterfowl, migratory birds, and overwintering species abundant in this area at locations such as Reelfoot Lake and Land Between the Lakes. The marine biology labs were primarily conducted on the trip and focused on various marine organisms that occupy the Atlantic coast and Gulf of Mexico.



The students had a unique opportunity because they went to the locations where the organisms they were studying about lived. Lindsey Bock, a junior biology major, said that she enjoyed being out in the field because it allowed her to have a hands-on learning experience, which she feels is necessary to fully understand and appreciate all that was

taught in the classes. The students were also able to gain a greater appreciation of God's creation, according to senior conservation biology major Josh Smith. This course not only taught the students about various marine biology and ornithology topics, it also emphasized the importance of conservation. While in Crystal River, Florida, the class was able to swim and snorkel with an endangered species, the manatee (pictured). Due to weather conditions, the group had an extremely rare opportunity to view at least 50 manatees.

After returning from the trip, the class was better equipped to identify birds and understand marine animals. The courses are going to be offered again this January to give more students the opportunity to study the numerous topics within ornithology and marine biology.

CHAIR'S CORNER



Dr. Mark Bolyard

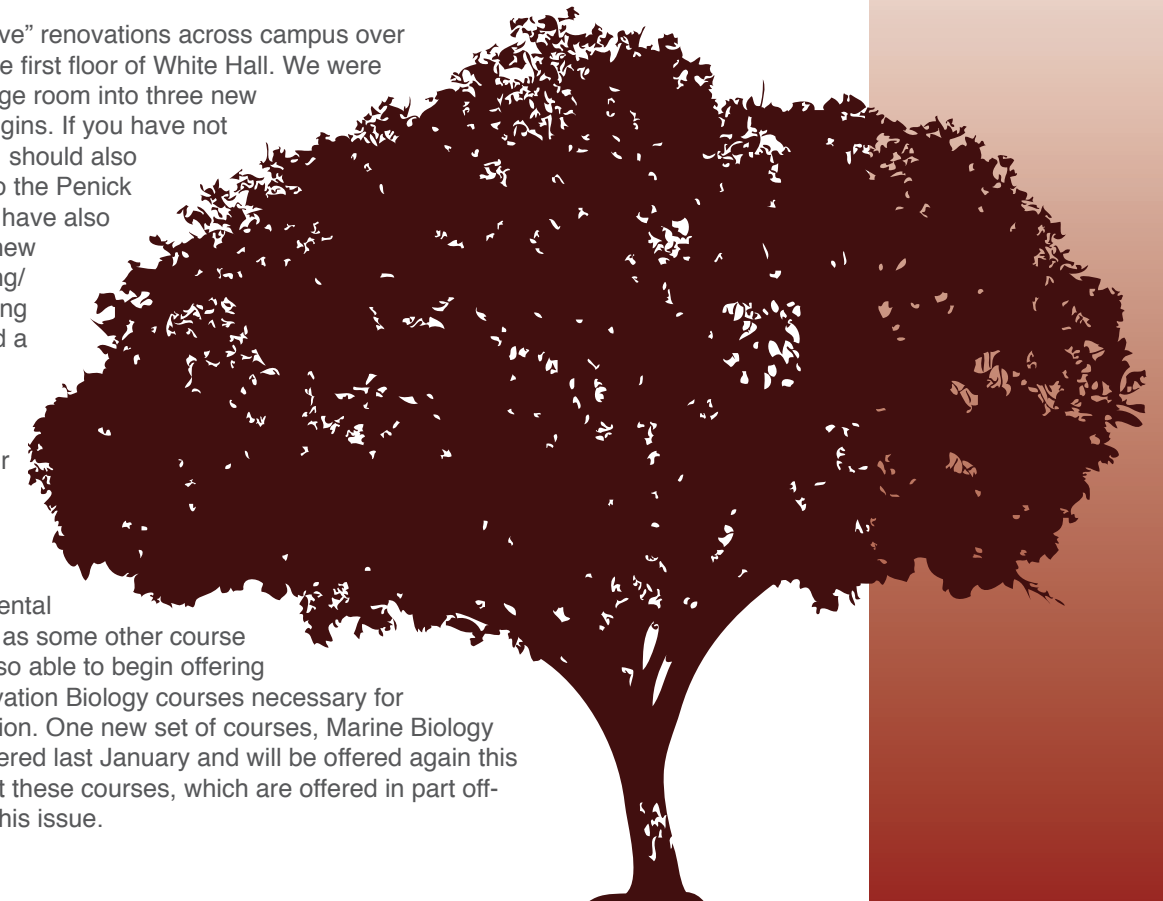
Greetings from the Biology Department! We are excited to start the 2010-2011 school year, with even more exciting developments taking place. First, although we were not able to hire our two new faculty members during our searches last Spring (which we hope to carry out again this year), we were able to hire Dr. Jim Mahan as a Visiting Associate Professor. Dr. Mahan is working with Dr. Huggins to teach the graduate Gross Anatomy and Anatomy and Physiology courses, which is a huge help. We were also able to hire Dr. Huggins' wife, Mrs. Cathy Huggins, as a full time Laboratory Instructor (learn more about Mrs. Huggins in an article in this issue). Mrs. Huggins' primary responsibility at this point is to teach our Microbiology labs, allowing Mrs. Elsie Smith to return to teach the Microbiology lectures. We are excited to see Mrs. Smith around the department each week! Update: Mrs. Smith fell early in November and broke her kneecap, but is recovering well! Please keep Mrs. Smith and her husband in your prayers. We have also been able to hire a new departmental Secretary, Mrs. Wendy Williams, who you will meet in this issue as well.

There have been "massive" renovations across campus over the summer, including the first floor of White Hall. We were able to convert our storage room into three new offices, one for Mrs. Huggins. If you have not been to Union lately, you should also check out the changes to the Penick Academic Complex. We have also been able to add some new equipment to our teaching/research arsenal, including a fish electroshocker and a biological safety cabinet for Microbiological work. We are also still working toward finding funding for our greenhouse.

Curricular changes are also coming, including implementing a departmental honors program, as well as some other course modifications. We are also able to begin offering some additional Conservation Biology courses necessary for Wildlife Society certification. One new set of courses, Marine Biology and Ornithology, was offered last January and will be offered again this winter. Learn more about these courses, which are offered in part off-campus, in an article in this issue.

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INSTRUCTOR PROFILE

by Kayla Hauss



Cathy Huggins

MRS. CATHY HUGGINS IS A new and bright-smiling addition to the biology department this year. She obtained a BS in Biology from Arkansas State University and her MBA from Union University. She worked as a Medical Technologist for eight years in a private clinic. She was also a Medical technologist for ten years at the Methodist Hospital of Memphis, eight of those as the Manager of the Toxicology Lab doing forensic drug screening. Her duties included serving as an expert witness for drug screen court cases that included mostly labor union arbitrations

and civil service hearings. Mrs. Huggins later spent twelve years as a Sales Representative for a capital equipment company and two national laboratories. She enjoyed her sales jobs, but traveling four out of five days each week just wasn't much fun anymore. She also wanted to have a more active role in the ministry of her husband, our own Dr. James Huggins, who, along with serving as a University Professor at Union, is a full time Baptist pastor. She started teaching at Union just to help out and quickly fell in love with teaching and the students. "When the opportunity came up to teach labs full time, I felt like God said this is where he wanted me." Mrs. Huggins serves as a full time laboratory Instructor, and teaches Microbiology labs, Biology 100 labs and Biology 112 labs. She said teaching labs in the biology department allows her

to pull from knowledge in the Medical Technology field. "I learned a lot of skills that I can share with the students, many of whom are pre-professional. Different lab exercises bring to mind lots of real life examples from my past. I think these examples help the students relate and remember the basic principles that are being taught". Her favorite things about the biology department are the friendly faculty, excellent students, and beautiful White Hall. Mrs. Huggins also enjoys working with her husband, though she rarely sees him. "He is two doors down from me, but we are both so busy at work that we call each other on the cell phone just to know where the other one is". Mrs. Huggins has been an excellent addition to the biology department and we look forward to having her around for years to come.

ALUMNI PROFILE

by Nathan Chatham

DR. CATHIE SCARBROUGH (*photo, left*) received the call to international medical outreach as a high school student. Upon joining the Union community, Dr. Scarbrough found an environment that she said not only provided her with a quality education, which served her well as a medical student, but also supported and encouraged her call. The Union environment was so supportive, in fact, that Dr. Scarbrough was able to travel on her first overseas trip to Costa Rica during her time here.

After receiving her undergraduate degree from Union, Dr. Scarbrough went on to attend medical school at the University of Tennessee Health Sciences Center. Despite this busy time in her life, Dr. Scarbrough was able to serve with several more teams abroad including her first medical trip to El Salvador. Over the years, she has served in Central and South America, West Africa, Southeast Asia, and Central Asia; each trip provided new and unique lessons and opportunities.

During a fourth-year medical school rotation, Dr. Scarbrough's decision

to pursue international medical work was cemented when she spent two months in northeast Thailand using her profession to further the Kingdom. She recently returned from fourteen months in Central Asia teaching at a family medicine residency program. "The best part was being a part of a community of believers abroad. The depth of friendships was unlike any that I had experienced previously. It was an amazing thing to work with other believers of all different backgrounds and cultures toward a common purpose - a real glimpse of the true kingdom."

Now back in the United States, Dr. Scarbrough is working in a small community northeast of Birmingham, Alabama, as a family medicine physician doing both inpatient and outpatient work, although her service abroad isn't over. When asked

about her future, Dr. Scarbrough says, "I feel that since God has provided me with an education, support, and opportunities to go, I should go whenever and



wherever He sees fit to lead. The more places I go, the more opportunities I see. After all, the Great Commission is a command, not an option."

STAFF PROFILE



Wendy Williams

WENDY WILLIAMS IS one of the newest additions to the "White Hall Family" and is working as the Administrative Assistant in both the Biology and Chemistry departments, and most recently has added duties in the School of Nursing. Wendy is an alumna of Union University, studying Music and Psychology while she was here as a student. Wendy graduated in December of 2008 and married her high school and college sweetheart, Blake Williams, in April of 2009. Blake and Wendy are members of a local church,

All Saints Anglican, where they sing in the choir. Both of them were members of University Singers while at Union. One interesting fact about the couple is that while in Singers, they were blessed to tour France with the choir. While in Paris, Blake proposed to Wendy on the Eiffel Tower, and of course, she said yes! The newlyweds have made their home in Jackson with their two Cardigan Welsh Corgis, BB and Lily. Both Wendy and Blake have a love for animals and are hoping to eventually show their dogs in confirmation, obedience and agility. Blake is a member of Best Buy's "Geek Squad" and loves working with computers. Wendy is thrilled to be a part of the Union Community again and feels a sense of completeness by working in such a loving, Christian environment.

She says, "I feel like everything I do here makes a difference in some way, and I love feeling valued by everyone around me."

Wendy is currently working on several projects for the Biology department including the Alumni newsletter, website updates, Facebook page updates, and a poster project encouraging students to consider getting a Ph.D. Wendy hopes to find new and better ways to connect alumni to the campus and the department in the future. She also wants to encourage students and alumni to stay connected through the department and alumni Facebook pages. You can find them on Facebook by searching for "Union University Biology Department" and "Union University Biology Alumni."

RESEARCH UPDATE

by Beth Lee

DR. MARK BOLYARD, PROFESSOR and Chairman of the Union University Biology Department, is currently supervising several students involved in research projects with distinct subject matter. Reflecting his doctoral research on the biotechnology of blood coagulation and his post-doctoral research dealing with plant tissue culture and genetic engineering, Dr. Bolyard's interests have led him into various research endeavors allowing biology students at Union to expand their horizons and choose projects of interest.

In cooperation with another professor, Dr. Marc Lockett, Dr. Bolyard is working with undergraduate researcher Carson Rider on a project involving the bacteria *Escherichia coli*. This team is using engineered bacteria to observe blood clotting factors (thrombin and Factor X) and their inhibitors. They have modified the green fluorescent protein (GFP; found originally in some jellyfish) to form a substrate for the two clotting enzymes. This will allow them to evaluate the effectiveness of different coagulation inhibitors that might be present in a wide variety of hematophagous (blood feeding) organisms. The results are measured by observing the amount of glow

remaining after the addition of inhibitors to a reaction containing the GFP and clotting enzyme. If an inhibitor is present, thrombin or Factor X will not cleave the fluorescent substrate protein and the glow will remain. Union University's new fluorescence microscope will be an important tool for this research.

Another project currently underway at Union deals with plant tissue culture of African mahogany. This project was inspired by a south Sudanese friend of Dr. Bolyard's. African mahogany trees are commonly found in this area. Dr. Bolyard is supervising Danielle Blackstone, a senior biology major (pictured), in the attempt to regenerate African mahogany trees from leaf tissue. Tissue culture is a process that causes plant cells to "lose their identity" followed by the growth of the cells until they have regenerated into tissues necessary to cultivate a new plant. The regeneration process for the mahogany trees has begun and

the leaf tissues have formed a "callus" (a mass of undifferentiated cells), which is typically the first step in regeneration. If successful, this project could provide information for a reforestation project that could have a beneficial economic impact in south Sudan.

Dr. Bolyard's most recent project was inspired by his short term mission work in Lithuania. He is collaborating with a Lithuanian graduate student, Jonas Ziuka. Ziuka and his advisors have sent samples of an unidentified bacterium found in the European aspen cultures to Dr. Bolyard and Carrie Moore, an undergraduate research student. Experiments will be performed to determine the identity of the bacterium, and once known, the results may prove useful to Ziuka's studies.



By participating in these three projects under the supervision of Dr. Bolyard, Union students are getting significant exposure to the opportunities of biological research, as well as experience for their future careers in the field.