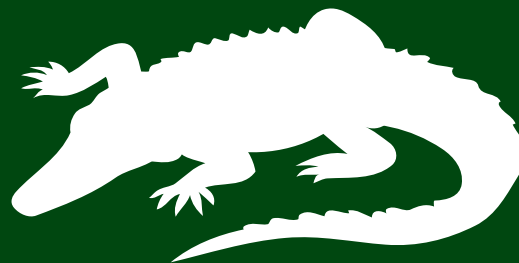


# DEPARTMENT OF BIOLOGY NEWSLETTER

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## CHAIR'S CORNER

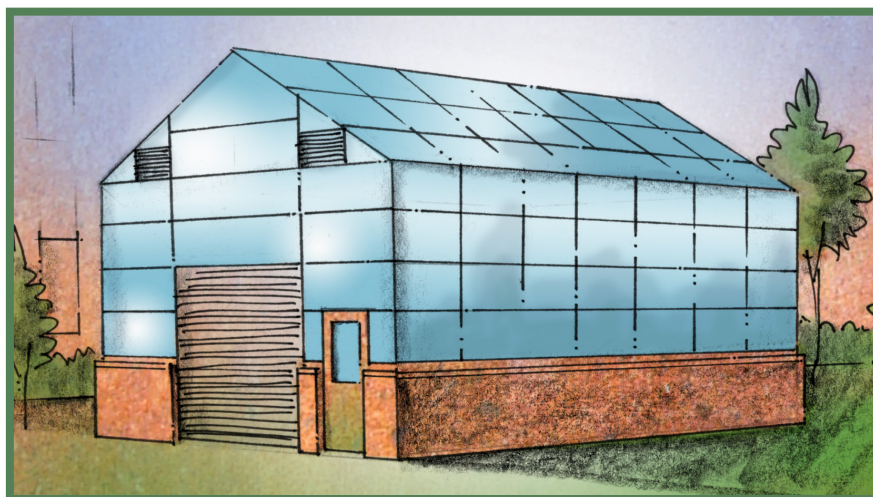


Dr. Mark Bolyard

Greetings from Union after a beautiful, warm, spring semester! As usual, lots of things are happening here in the Biology Department. First and maybe most significantly, we stop to recognize the relationship between Union and Mrs. Elsie Smith, which began 50 years ago! Mrs. Smith continues to teach microbiology, and we are glad to have her continuing to be part of our departmental family. While we celebrate the longevity of Mrs. Smith's tenure, we also welcome new members to the team. We are pleased to add our third full-time instructional staff person, Dr. Lisa Conway, who will be working with Dr. Tony Wamble in some new academic ventures involving human gross anatomy. As I write this newsletter, we have just learned that Dr. Michael Schiebout, a plant scientist who has just completed his PhD at the University of Northern Colorado, has accepted our offer to join

the Biology Department this fall!! We are thrilled!! Having a new plant scientist on board will give us the opportunity to offer some new plant courses, in addition to the collection of new courses already on the books, including Environmental Ethics, Conservation Techniques, Experimental Design and Biostatistics, Medical Parasitology, and Global Biology (for non-majors). We'll keep you posted on further curricular changes as they happen.

We're also excited about building projects that will impact the Biology Department. First, April 12th marked the groundbreaking ceremony for Union's new library, which should provide additional resources for our students and faculty. Second, Union's new facility in Hendersonville, which includes a Biology lab, is scheduled to be dedicated August 2. Finally we are still working on raising funds for our greenhouse, so if you have any interest in being part of this project please let me know and I'll send you a brochure. We look forward to sharing more with you in our next edition!



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## FACULTY PROFILE

by Beth Lee



Mrs. Elsie Smith

Since the fall of 1962, the Union University Biology Department has been blessed to have **Mrs. Elsie Smith** as part of the Biology Department. This year marks her 50-year teaching anniversary. She credits the Lord for her lengthy career,

remarking that it was His grace that led her to Union's doors. Mrs. Smith did not apply to work at Union, but rather, the university sought her out and asked her to join the staff. Since then, Mrs. Smith has taught classes ranging from Genetics to Microbiology, advised innumerable Pre-Med students, and served as Biology Department Chair for 15 years. She has watched Union University grow in its current location from the ground up, a constant among an ever-developing work environment. At the beginning of her teaching career, there were only three

professors in the biology department and the campus had not yet relocated. Today, there are 17 professors and instructional staff members in the department, who, along with the growing population of biology students, are quickly outgrowing even the newly-built White Hall.



I had the privilege of speaking with Mrs. Smith regarding her lengthy career, and she told me she viewed teaching as a "calling rather than a job." The students have been her favorite aspect of Union,

and she mentioned that she has spent countless hours in her office advising them, explaining concepts, or just talking to them individually on a personal level, as well as frequently opening up her home to them. Nostalgically regarding the many biology students who have passed through the department, she mentioned how they "enriched her life beyond measure," and how proud she was "to have been a part of their transformation from young people into professionals." She has enjoyed working with undergraduate biology students, watching them learn, graduate, and grow up; some to become her current doctors, optometrist, and dentist.

Mrs. Smith is still part of the rich, Christ-centered education provided by the faculty of the Union University Biology Department. She has touched so many lives throughout her years, and plans to continue as long as her priorities allow. A love for teaching and her students radiates from her in everyday conversation, and the Biology Department is lucky to have a teacher like Mrs. Smith.

## ALUMNI PROFILE

by Erin Spencer



Dr. Gene Stevens

**Dr. Gene Stevens**, a current faculty member at the University of Missouri in Columbia, spoke at Union University March 28, 2012, on recent agricultural research that he has been conducting in Africa. However,

Dr. Stevens is no stranger to the Union University Campus, having graduated from Union in 1979. While attending Union he obtained an internship with the University of Tennessee Agricultural Center, where he gained agricultural experience working with soil. This undergraduate experience led to a research assistantship in Knoxville.

Since that time, Dr. Stevens has been involved with research projects that include the testing of soils and their proper utilization. One of his more significant research projects focused on agricultural water loss control in areas that lack adequate water supply, such as in poor countries like South Africa. The research farm that Dr. Stevens and his colleagues set up in South Africa focused on an increase in rice production, at which point he and his colleagues turned their work over to Texas A&M University for further follow up study. According to Dr. Stevens, "We start a project and get it up and running. Then, we quickly turn it over to another group who is capable of following up on what research we have already performed, and move on to the next project."

Dr. Stevens also worked on a project in which genes for a particular drug were introduced into tobacco plants

under vacuum. During this time, the genes introduced would be absorbed into the leaves. The leaves could then be harvested in order to produce helpful drugs or vaccines.

Dr. Stevens recently received the USA Rice Producers Award, presented to a researcher from the United States who has had the most impact on rice research during the year. During 2012, UT will also award Dr. Stevens with the Biological Systems and Soil Science Department Alumni Award. When asked about receiving the award in the upcoming months, Dr. Stevens commented that he had no idea they knew about his research until they called him and informed him. "That's why it is so crucial to publish your work," Dr. Stevens says, who asserts that many researchers underemphasize this part of the process.



## RESEARCH HIGHLIGHT

by Jared Littlejohn



Dr. JR Kerfoot

Research continues to be an important element of the Biology program at Union University. Dr. JR Kerfoot, Assistant Professor of Biology, is working with collaborative and independent

research students on a variety of projects.

One project examines the influence of pheromones on escape response in the blackstripe topminnow. John Kartzinel began the project by measuring the influence of pheromones from conspecifics or predators (smallmouth bass) on the escape velocity of the topminnow, while collaborative research students examined the impact of alarm pheromone concentrations on the response of the predator.

A separate collaborative group continued the research with zebras at the West Tennessee Safari Park (see the Spring, 2011 Newsletter). The focus was on finding the most effective way to

control endoparasites in the park's zebras. The group compared the incorporation of diatomaceous earth in the diet vs vaccination. Preliminary results indicate that diatomaceous earth was more effective and economical than the vaccine.

Sarah Williams worked with Dr. Kerfoot to investigate the influence of temperature on the feeding ability of the invasive lionfish, which have been accidentally introduced into the Atlantic Ocean. As the lionfish continues its northward migration along the Atlantic coast from the Caribbean, where it has decimated coral reef populations, it will eventually encounter lower average water temperatures. Preliminary results indicate that there is large variability in the attack velocity and other feeding kinematic variables between temperatures ranging from 18 – 26 °C; however, more individuals are being acquired to verify these results.

Dr. Kerfoot has also worked with Micah Fern in traveling to coastal Louisiana to film alligators to determine whether feeding kinematics change during development. Results indicated that the time it takes to feed and the

velocity at which they open their mouths does not change as the alligators grow. This may be explained by the fact that as cranial elements increase in size, muscle mass increases proportionally to stabilize these timing variables.



Micah Fern and friend

While managing the various research projects, Dr. Kerfoot finds time to publish his results. Since his beginning at Union University in 2009, Dr. Kerfoot has published research results in such journals as *Florida Scientist*, *Environmental Biology of Fishes*, and the *Journal of Experimental Zoology*. Currently he is working on a manuscript highlighting the alligator research outlined above.

## NEW COURSES

by David Koh

The Biology Department is offering a variety of new courses, such as Experimental Design and Biostatistics, which will be taught by Dr. JR Kerfoot, and will soon be required for students electing the Collaborative Research Option. Topics will include: describing populations of organisms, designing defensible experiments, and addressing each component of the scientific method. The major goal is to provide valuable background knowledge in the statistics and experimental designs that are crucial to research.

Environmental Ethics was taught during the Spring semester by Dr. James Huggins. Topics include the loss of biodiversity, pollution, world hunger, genetic engineering, reproductive technologies for endangered species, global warming, and ozone depletion. "We hope to prepare students to meet the challenges of global conservation needs and/or for graduate education," says Dr. Huggins.

Dr. Huggins will be joining Dr. Kerfoot and Dr. Andrew Madison in teaching Conservation Techniques, in which



Global Biology lab

students will learn about anesthetizing wild animals, vertebrate, invertebrate & plant collection techniques, genetic techniques, radiotelemetry, electrofishing, aging techniques for vertebrates, and population census techniques, among others.

Plant-Insect Interactions was also recently offered by Dr. Huggins and Dr. Madison. The course covered such topics as insect feeding and plant defenses, host plant selection and insect development, insect defense, insect communication, insect sociality, pollination, and biological control of insects. The focus of the course is to prepare students to face the challenges of conservation needs and to help them integrate a view of God's

plan for the environment with the field of Conservation Biology.

Global Biology will be offered every Spring semester and was co-taught by Dr. Mark Bolyard, Dr. Marc Lockett, and Dr. James Huggins for the first time during Spring, 2012. The course is a "core" course (replacing Human Biology) and is also required for the new Humanitarian Studies minor. Topics covered included biodiversity, health and nutrition, food and agriculture, and land use/conservation.

Parasitology is currently offered by Dr. Mark Lockett. This course includes taxonomy of parasites, ecology and life cycles of various parasites, and their effects on the host. "This course involves physiology, biochemistry, cell biology, as well as ecology and zoology," says Dr. Lockett. This course also helps students better understand the vast impact of parasites on a majority of the world's population.

We are also looking forward to new courses to be offered by our new Plant Scientist, Dr. Michael Schiebout, including Plant Physiology. Stay tuned for more additions to our curriculum!



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## NEW STAFF MEMBERS

by Julie Cobb

The Union University Biology Department is excited to welcome Dr. Robert Wamble and Dr. Lisa Conway as Instructional Staff members. Dr. Wamble completed his undergraduate work at the University of Tennessee at Knoxville before attending Auburn University's College of Veterinary Medicine. Dr. Wamble comes to Union after retiring



Dr. Robert Wamble

from his private veterinary practice in 2009. After assisting with a Gross Anatomy class, Dr. Wamble is now teaching Gross Anatomy to graduate students in Nursing and Pharmacy, as well as developing a gross anatomy program for undergraduate Nursing students. When asked what drew him to Union, Dr. Wamble admits, "I have

always wanted to teach, but never thought I would have an opportunity to use my education to do so. What a joy to be able to share my faith every day as I help to teach and educate young minds for the glory of God."

Dr. Wamble also looks forward to developing new techniques and processes for studying anatomy and is currently developing a latex injection procedure to help students locate and study vasculature of the human cadaver. He is interested in a procedure called plastination in which tissues are turned into plastic. He explains that organs, muscles, and entire plants and animals can be preserved. Dr. Wamble further expresses that plastination "would put [Union] on the cutting edge when it comes to techniques and teaching applications."

Also joining Union's Biology Department is Dr. Lisa Conway. Dr. Conway received her undergraduate and Doctor of Veterinary Medicine degrees from Texas A&M University. Dr. Conway practiced veterinary medicine until 1989 when her husband

entered seminary and became a pastor. Since then, she has been a pastor's wife and homeschooled her four children, some of which have attended Union. Having worked with Dr. Huggins in the Gross Anatomy course, Dr. Conway will be working with Dr. Wamble in developing the undergraduate Nursing gross anatomy experiences, which is being integrated with the simulator elements of the curriculum. She will also be teaching undergraduate Anatomy and Physiology labs. She may also be helping to implement the undergraduate Nursing gross anatomy elements in Germantown or Hendersonville. We are excited to have both of these experienced educators and practitioners on board!



Dr. Lisa Conway