



BIOLOGY/ALLIED HEALTH DEPARTMENT

Life Sciences

Insights

2018 Pre-medical Summer Camp

Twenty junior and senior high school students interested in pursuing medicine as a career attended an intensive “boot camp” experience the third week of June. This three-day event was the largest summer camp at Southern Adventist University this year and was the first camp to fill when sign-ups opened in the spring.

Students gained experience in determining their own blood type, reading X-rays, taking vital signs, suturing, learning effective study habits, and practicing soft skills such as communication and team work.

The goal was to provide skills they could take with them while also having fun. These included science knowledge using an anatomy and physiology laboratory experience and metacognition, or ways to learn.



Participants learned to use a stethoscope in the simulated hospital lab.



A summer camper learns to read x-rays.

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Students in Service

Task Force Worker at Madison Academy

My name is Ashley Gonzalez, and I am a senior biology major at Southern Adventist University. This year, I'm taking a break from my courses and am serving as a task force worker at Madison Academy, my alma mater, in

hear, "Miss Ashley!!!" over and over. During these class periods, I am able to really interact with the students so that, together, the teacher and I can answer twice as many questions. Furthermore, I hold regular tutoring sessions where I help students one-

least one thing they did not know before. However, I don't always expect to have an impactful prayer and worship thought, because students sometimes feel like we are just going through the motions. During one worship, I was finally able to have a heart-to-heart talk with a student. My worship thought was about David dancing when the ark of the covenant finally was delivered. My student had an issue with the character of God as a result of Uzzah being killed just because he reached out and touched the ark. I was not expecting such a deeply spiritual conversation and did not know how to answer. In the few days after, we were able to delve into Scripture, and I prayed fervently for the right words to speak. After some research and help from the chaplain, we were able to both understand why Uzzah was struck by God and how God had seen the presumption and irreverence in Uzzah's heart. I am so blessed to have students that challenge me spiritually, and I am definitely learning just as much as I am teaching.

By Ashley Gonzalez as told to Tim Trott



During pre-lab lecture, students are given a quick briefing on what they will be learning during their lab.

Madison, Tennessee. Even though most student missionaries typically travel abroad, I believe that there is much work to be done in our own backyard. I have always had a passion for service and felt called to give back to the community where I grew up. I thoroughly enjoy mentoring students and being able to see them have that light-bulb moment where they finally understand something that they just could not grasp before. Madison Academy has given me the opportunity to teach Survey of Anatomy & Physiology (A&P) and Geometry to students who struggle with science and math. Along with teaching, I assist in other classes including Algebra I, Integrated Science, and Biology. I also assist during laboratories. I can expect to

on-one with questions they might have on homework, keep them from falling behind on their classwork, or show them how to study for tests and quizzes. God has given me the opportunity to minister to these students in a powerful way, and I hope to do so in a way that honors Him.

When I wake up everyday, I begin by praying that God will allow me to witness to others and that I can teach effectively so that my students might gain an abundance of knowledge. One goal I have is that, in the A&P class, students will always learn at



Students at various tables competed to see who could get the most points in a math game by answering algebra questions as quickly as possible.

Alumni Spotlight

Alexa Fisher

What is the next step after graduation? What will you do with your degree? How long are you staying out before graduate school? What are you doing in the meantime? I was asked all of these questions when nearing graduation and, for the most part, I had a plan. I was hoping to either find a job or an internship for a few months or a year, then I would study for the GRE, go to graduate school, and start my life as a marine ecologist doing research in or around the ocean. However, sometimes things do not go exactly as planned and instead turn out better than you ever hoped.

After graduation, I began to apply for both jobs and internships, and even though I have the most interest in doing marine work, I applied for many internships all over the United States, many not on a coast or even close to an ocean. I interviewed for an intern position in the Needles District of Canyonlands National Park near Moab, Utah, and then accepted the position 20 minutes later. I was excited to be accepted, but also a little nervous. Though I was from out-of-state when I came to Southern my freshman year, I knew a few people, which made settling in a little easier. However, venturing to Canyonlands meant living in an entirely new state, by myself, 75 miles from the closest “big” town, with no cell service and WiFi only when I was at the visitor center. For someone in her twenties, whose last few years were spent ending the night with Instagram, it was definitely going to be a change, but I digress.

By the time I got to Utah in August, I was excited and ready for my new adventure, though admittedly, I

was even more nervous than before. However, once I met everyone at my new “home away from home,” all nervousness vanished. The rangers I have the pleasure of working with are absolutely wonderful, and so are the interns. We have formed a little family and enjoy each other’s company after work, either hiking or spending time talking in each other’s homes. Having my own house is pretty great, I will say, but it’s far from the best thing of being in a national park as a ranger.

So, you may be wondering, what is the best thing about being a ranger in a national park? The answer: everything is the best! Since interning at Canyonlands, I’ve grown as an individual and learned a lot of new life skills that I would not have gained elsewhere. I work at the visitor center most days, offering advice and suggestions for hiking, camping, and traveling in the area. Additionally, I conduct campground “roves,” talking and interacting with individuals in their campsites, taking a census of the campground, making sure rules are being followed, and enjoying the scenery as I drive around. I work at the entrance station at least once a week, and sometimes I even get to hike all day in the backcountry, familiarizing myself with the trails and terrain so I can accurately talk to guests about them. In fact, on my days off I go hiking and hammocking in regional state and national parks, packing in all of my gear, hiking breathtaking mountains, and making my own meals over a toasty fire.

You may be thinking, *Alexa, you have a BS in Biology with a Research Emphasis, so are you even using your*

degree? Well, yes. Once a week I give an educational campfire talk to campers who are brave enough to sit in the cold (down to 40s now after sunset) or heat (in August) for 30-45 minutes while I talk and interact with them. I developed my talk myself and, naturally, chose to do an adaptations talk where I relay the amazing adaptations that plants and animals in the area have developed in order to survive. Who knew that what I learned about photosynthesis and the Calvin cycle in General Biology my freshman year would come in handy four years later! I also highlight metabolic processes and organic chemistry. You may think you will never use what you learn in a certain class in the future, but just give it four or so years.

Overall, I have had an amazing time during my internship and am grateful for the new friends, experiences, and adventures during my time here. I greatly encourage each of you to check out the Student Conservation Association and have an adventure of your own. You won’t regret it.

By Alexa Fisher as told to Ben Thornton

Alexa shown in her ranger uniform.



Origins

Announcing the New *Nature and Revelation* Podcast

The very first sentence in Ellen White's book *The Desire of Ages* reads, "Nature and revelation alike testify of God's love." One might think that the truth of this statement would be obvious, especially to those raised in religious homes who also have a deep love of nature. However, as with most things, the reality is more complicated.

Both of us were raised within the Seventh-day Adventist church and both of us, from a young age, have also had a deep and abiding fascination with the amazing creatures that inhabit this world around us. Some of our earliest memories involve Sabbath afternoon trips into nature, where we got to explore by flipping over rocks in tide pools or by peeling back the bark of decaying forest logs, all in an effort to discover the cool creatures that might be hiding there.

In many ways, not much has changed. We are still part of the Seventh-day Adventist church and still enjoy spending time in nature, finding cool creatures. However, the road between our childhood innocence and becoming practicing Seventh-day Adventist biologists, has not been easy. The unfortunate fact is that the deeper you delve into science (the primary way we understand nature in the 21st century), the more you will be exposed to ideas and philosophies that will challenge your faith. This is nowhere more true than in modern biology, where the overwhelming consensus is that living things have their origin in processes that don't

need a Creator (or at least render a Creator's actions undetectable). For those who want to pursue biology, a tension will likely emerge between personal faith and the weight of the scientific consensus.

For Professor David Nelsen, this tension came to a head during his senior year of college at the University

background to even begin to address this issue. He assumed his professor was an atheist, not sympathetic at all to his inner struggle, and he was too afraid to ask his classmates. He felt alone.

Professor Aaron Corbit's story followed a similar path. He remembers having many questions about science and faith. He too felt the weight of the scientific consensus, and when he brought his questions to those in his church, he found a lot of misinformation and unhelpful attitudes.

Ultimately, both of us found our footing through personal study and dialog with others—especially the caring professors in the Department of Earth and Biological Sciences at Loma Linda University, where we both received our doctoral degrees. But the realization that both of us had such similar experiences, left us wondering how many others have gone, or are going, through similar trials without the benefit of a community that could take their questions seriously.

This is why we have launched a new podcast we are calling *Nature and Revelation*. We want to create a place where we can discuss issues of science and faith deeply and honestly and provide a community for those who may resonate with our experience. Our ultimate aim is to help people find their footing and be able to fully affirm that both nature and revelation do, indeed, testify to God's love. Find us at www.natureandrevelation.org.

By David Nelsen and Aaron Corbit



of Tennessee at Chattanooga. In a mammalogy class, he first learned about the fossils that are said to document the evolution of modern mammal from more reptilian ancestors. He felt the weight of the evidence in favor of the evolutionary story. Could this fossil sequence be reconciled with a Biblical worldview? He didn't know, and he also didn't know who to turn to for guidance. His parents were not into science, and he was sure they didn't have the

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A practical method to discover what they felt God was calling them to do in a career was introduced.

Tim Trott, PhD, and Rick Norskov, MD, emailed this question to participants ahead of time: “Who is the real doctor?” The students were equally divided the first morning as to which professor was the “physician.” Of course, these biology professors are both real doctors, but it caused students to think about higher education in a broader sense.

Pre-med students, a doctor of physical therapy, and a dentist interacted with students during the second day. Also several physicians participated in “speed interviews” where the high-schoolers changed stations every five minutes around the room.

The last morning was a favorite with a simulated hospital experience in the skills lab at Florida Hospital Hall on campus. This “final exam” incorporated skills learned from the past two days. Student visited stations to wrap ankles, interview live patients, work with “simulated” patients, and read x-rays.

The most common feedback at the end of the camp was that participants wanted the camp to last for a whole week next summer.

By Rick Norskov



The high-schoolers got to try suturing techniques.

MCAT Test Prep Coming to Southern

A large percentage of our biology students identify themselves as pre-medical. A major part of their preparation process is completion of the MCAT (Medical College Admissions Test) sometime during their junior or senior year. As the competition for seats in medical schools has increased, more and more students are finding it necessary to enroll in a formal MCAT preparation program. Of the many programs available, Altius MCAT Prep is a fairly new option for those taking a preparatory course for the test. Altius has been available in several cities in Utah and other West Coast states but has not had a major presence in the East or Southeast.

Comments on Reddit and pre-med websites suggest that Altius uses material comparable to other prep courses, but they capitalize on their knowledge of the new post-2015 MCAT, showing a greater emphasis on conceptual thinking rather than on rote memorization. Altius promotes smaller groups, attention to detail, and the attentiveness of tutors. It's a unique combination that seems to work for lots of MCAT-prepping upperclassmen. Like other companies, tutors are obligated to make themselves available to you 24/7 for whatever you need, but unlike other programs, one-on-one tutoring sessions are built into the course.

For the past two years, biology students have been going to Utah to take the Altius prep program. Last summer, our numbers increased to well over 20. During the school year, Altius offered a short course on Southern's campus as a promotional event, drawing students to their product. Altius has also hired several of our students as local tutors, specifically aimed at serving our student population. This coming summer, we have invited Altius to offer a full summer course here on our campus, and the company accepted. This means that our students will no longer have to travel to Utah to participate in this program, which will also help decrease travel and housing costs, especially for local students. Altius has been impressed by our students, both academically and personally. We have a lot in common with the leaders, as they appreciate our stance on alcohol and tobacco use and healthful living.

We look forward to having Seventh-day Adventist students from across the United States join us as we try our best to prepare them for the rigors of the MCAT and medical school.

By Keith Snyder and Tim Trott

Power for Mind & Soul

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Department Happenings

Noemi Gonzalez, who has taught for us several semesters as an adjunct professor, has joined our faculty full-time this fall as an assistant professor. She received her BA in Biology and BA in Secondary Education from Antillean Adventist University. She then finished her MS in Biology at Andrews University and went on to become a medical technologist. Her work has included experience as a medical lab scientist in several different hospitals and teaching in a variety of educational settings, including online courses. Professor Gonzalez enjoys helping young minds discover the joy of God's creation. Please join us in welcoming her to our department!

In January 2019, we will accept our first cohort into the Physical Therapy Assistant program. Chris Stewart, Chair, and Mandy Sharpe, Director of Clinical Education, have successfully negotiated the first visit by the national accreditation committee and are diligently preparing for the entering class. The five-semester program prepares students for immediate work in physical therapy. We are excited to be able to offer this program to our students.

Professor Aaron Corbit gave an oral presentation on research done with Matthew Lopez. They investigated the special silk that black widow spiders use to defend themselves

from predators. This defensive silk has unique physical properties that differ from other spider species. In contrast to the sticky glue of other spiders, which does not dry, we found that the sticky glue associated with black widow defensive silk dries quickly. In fact, it dries so fast that it is difficult to explain just by reference to the evaporation of water from the glue droplets. This suggests that there may be a chemical process as-yet-undescribed that facilitates the rapid drying.

Professor David Nelsen also presented a poster describing and comparing the physical structure of defensive silk produced by black widow spiders with the sticky spiral silk of orb-weaving spiders. Both of their presentations occurred at the national meeting of the American Arachnological Society in Ypsilanti, Michigan.

Over the summer, we were able to purchase a new refrigerated, tabletop Sorval Legend centrifuge. This multi-application equipment replaces a very old ailing unit and has greatly increased the types of procedures possible due to its very adaptable and high-volume rotor system. This is just one of our efforts to continue to modernize and update laboratory equipment to provide students the chance to learn current methods and techniques.

By Keith Snyder