

# Lifelines



Biology/Allied Health Department

## Insights From the Professor

### Do You Really Dig Dinosaur Bones?

**OVERVIEW:** Since 1998, the Hanson Research Station has provided a place for teachers, researchers, and families interested in digging dinosaur bones to go and experience the joy of finding something nobody else has ever found. It is located in the least populated county of the least populated state in the lower 48: Wyoming. There is much of what some call “raw beauty.” The fees are the lowest available for any dig site, and visitors get to dig, record, photograph, and log real bones. You don’t just haul dirt for others. The bones that visitors unearth are cataloged under the finder’s name in the online museum. It is a fantastic opportunity.

**HISTORY:** About 15 years ago, a Baptist rancher named Glen Hanson contacted Lee Spencer, Ph.D. (then Utah State paleontologist) about coming to look over some fossils on his ranch. Apparently, an evolutionary paleontologist had spent a few years there and would tell visitors only the evolutionary side of the story but nothing about creation. When Glen asked him to include the possibility of creation, he stomped off and said something about no good science ever being done on the ranch. However, for the past 15 years, paleontologists believing in a short-term creation have done cutting-edge research in one of the richest dinosaur bone beds in the United States.

**MAIN QUARRIES:** The main quarries contain primarily *Edmontosaurus* bones, with a few *Triceratops* and theropod bones scattered in. These big creatures were about 40-plus feet long and weighed up to four tons. A large thigh bone (femur) can be five feet long.

Most of the bones are found in a single layer about one meter thick. The bones are sorted

by size, with the smaller bones at the top and progressively larger bones located down to the bottom. This is indicative of catastrophic water transport over fairly long distances.

**OUTLYING QUARRIES:** Three outlying quarries have opened in the past four years.

1. **Gar Quarry** is where small bones and teeth collected behind a “lag” in flowing water. Several rare mammal teeth have been found there.

2. **Rose Quarry** is about one-quarter mile away. A large number of *Triceratops* and theropod bones are being found there. Also, almost a dozen complete turtle shells have also been uncovered. The bone layer is only about six to eight inches deep and is geologically interesting due to the mud and sand concretion mix surrounding the bones.

3. **Ivarrest Quarry** site opened just last year and promises to be a superb site. It is about half a mile from the main quarries and looks somewhat like Rose Quarry in its geology. It has the same turtle and *Triceratops* bones but boasts a much richer concentration of small bones and theropod bones. This high number is unique, and plans are being laid to move toward publications in both Rose and Ivarrest Quarries.

This coming summer the quarries will be open from May 29 to June 26. You can come for a day or the whole time. The longer you stay, the cheaper it gets. You can get college credit for a reduced price if you are a high school junior or older. For prices and more information, visit <http://dinosaurproject.swau.edu/participation>. Join us there this summer. You’ll really dig it!

By Keith Snyder



**SOUTHERN**  
ADVENTIST UNIVERSITY

Power for Mind & Soul

Biology/Allied Health  
Department  
P.O. Box 370  
Collegedale, TN 37315  
Phone: 423.236.2926  
Fax: 423.236.1926  
[southern.edu/biology](http://southern.edu/biology)

Joyce Azevedo, Ph.D.  
Randy Bishop, MSPT  
Ann Foster, Ph.D.  
Lucinda Hill, M.D.  
Valerie Lee, M.S.  
Rick Norskov, M.D.  
Lee Spencer, Ph.D.  
Keith Snyder, Ph.D.  
Debbie Strack, Office Mgr.  
Ben Thornton, Ph.D.  
Neville Trimm, Jr., Ph.D.  
Tim Trott, Ph.D.

# Students in Service

## A Call to Lebanon

“Marhaba!” said the black-haired lady who cautiously opened the door. “Marhaba,” I replied, as the woman opened the door wider. “Stas, Essam hone...” I said. Upon hearing this, the lady vanished for a few seconds and reappeared with a hijab (a Muslim head covering for women that completely conceals all traces of hair, showing only the moon of the face) and opened the door wider, saying, “Fhadahlo.” The two of us entered the dim corridor and were led to a room directly in front. We took our shoes off at the door and entered the small room, where there was an old couch with a mattress along one wall and a neat stack of cushions and blankets in the corner. The lady motioned for us to sit down while saying “Ki fak” to the man with me, who replied, “Mneeh.” My friend Essam continued talking in rapid Arabic, asking about the family and how things were going with work and school. After a little while, the lady excused herself to put some water on to boil before coming back. Then the flow of words continued.

As we entered, I quickly surveyed the surroundings, and noticed that everything was neat and clean, and the window was left open to allow some fresh air in. During the course of our visit, we found out that there were 11 people living in that one small room, and I knew that the blankets stacked beside me wouldn’t be enough for all of them. I always enjoy visiting the homes of my students at the Center of Influence School for Syrian refugee children. I realized again how blessed I am in my room joined to the green classroom (which I call my parlor, since it is literally outside my door). I have three blankets and a heater to keep me warm, I have electricity and a generator when the city electricity goes off, I have food—three meals a day—and no lack of something to do.

This day we were visiting the home of one of my students from

our “green room.” The school has four classrooms: pink, blue, green, and purple. The school is divided up into colors instead of grades, since there really are no grades here yet. Some kids have been in school before, and if they are lucky they had to wait only a few months between schools. But most of our kids either haven’t been in school before or else it has been a year or more since they attended any school.

I never dreamed I would be a teacher, and especially not an English teacher! I remember hearing the story of a man who hated school as a boy and was determined to get out of school as soon as possible; yet as the years passed, he found himself a teacher and still in school. I remembered this story because I had told myself that, unlike this man, I really wouldn’t stay in school. Yet here I am only a few years later, still in school, and teaching English to more than 60 Syrian refugee kids!

At Southern, I am a biology major; here in Lebanon I am Miss Pingu (the name of one of the characters I use to teach English). At Southern, my duties are roughly to learn as much as I can and do as well as I can in all of my classes. Here, my duty is to serve.

Service is not something that comes naturally to me; I have to learn how best to serve, how to know and understand

my students, and how to be aware of what makes them happy and what makes them sad. I have to be willing to bend down and get dirty and do the jobs others don’t want to do, and I must



More of Tami’s students in the green room.

be ready to just sit and listen in order to earn someone’s trust and love. In order to do this well, I need to train my actions, thoughts, and words to listen to the One who sent me and reflect His character.

Coming to Lebanon as a student missionary has not turned out to be a “year off of school,” and it definitely is not a vacation. Instead, it has been an intensive course on the fundamentals of service to others and how to apply these fundamentals practically in my life. At Southern I may have a test every two weeks or so, but in the school God is taking me through here in Lebanon I have tests every day, and many days there are multiple tests per day. I am lectured through my experiences and the experiences of others. I will not be surprised if at the end of this year of student missions, I find that I have learned more than ever before. I am grateful that Southern has made it possible for a biology major like me to have this kind of learning experience during my university years.



Tami Giebel, biology major, teaches Syrian refugee children.

By Tami Giebel



# Alumni Spotlight

## Andre and Jennifer (Cherne) Castelbuono

### Q: How did you two meet?

**Andre:** We met while students at Southern. Our older siblings were dating, and I was invited for a weekend in the Smokies with my older brother's girlfriend's family. To make a long story short, we met, sparks flew, and after becoming friends for a few years we started dating.

**Jennifer:** Andre and I met while at Southern during my freshman year. He was a sophomore. We met on a family trip to the Smoky Mountains during October break. My sister was dating his older brother, and they brought him along. Never overlook family trips; you never know who you'll meet. ☺

### Q: Tell us about your route from Southern to medical school and residency. What are you doing now?

**Andre:** I started by studying abroad at Newbold College in England for my freshman year, then I spent the next three years studying biology at Southern. During this time, I spent a summer at Rosario Beach taking marine biology classes. After graduating from Southern, I went straight to Loma Linda to start medical school. Four years later in 2010, I matched to an emergency medicine residency in Dayton, Ohio, at Wright State University. I spent the next three years there before graduating and moving to Knoxville, and I now work in Oak Ridge, Tennessee as an emergency medicine physician.

**Jennifer:** I didn't officially decide to do medicine until the week I actually started. It had always been in the back of my mind, something tugging on my heart, but the commitment was so great that I just wasn't sure. After spending a year in Costa Rica teaching English, I returned to Southern and finished my bachelor's degree in nursing. I had already

completed most of the pre-medical courses at Southern but still lacked physics. After graduating in 2008, I took physics and the MCAT over the summer, then moved out to Loma Linda to work as a nurse in the ICU while applying to medical school. The following year I started medical school at Loma Linda but then transferred to Wright State University after Andre matched to residency in Dayton, Ohio, and we got married. From there, I finished medical school then matched to anesthesiology at University of Tennessee/Knoxville and am currently in my first year of residency. Even though it was a big commitment, choosing to do medicine was one of the best decisions of my life.



Andre and Jennifer in front of Zambezi River in Zambia, Africa, near Victoria Falls.

### Q: What are some challenges of both of you being doctors?

**Andre:** One of the biggest challenges is time management. Just making it through medical school and residency is a lesson in using your time wisely. For me, it was always important to have time for God and Jennifer and to exercise each and every day. Now with Jennifer in her residency, her schedule can be pretty demanding, so we often look ahead week-by-week to see when we can carve out time for each other.

Another challenge is finding a way to let our faith and belief in God be incorporated into our practice. Jesus was the divine healer, the ultimate

physician, and the One I will always try to emulate. In our "politically correct," "try not to offend anyone" society, sometimes it can be tough to know how to bring up God to your patients. What I've seen in practice is that in the ER, patients and families are in such a vulnerable position that they are often very receptive to having prayer. And even if they are not interested in me praying *with* them, it doesn't stop me from praying for them anyway. ☺

**Jennifer:** I second what Andre was saying. Time is probably the biggest challenge. Time for each other, time with God, time with family. So much is asked of you in the world of medicine when it comes to time. We've missed family vacations, holidays, and other events due to our busy work schedules. However, even though time is a challenge and much of it is spent in the hospital, the learning and experience pay off in the end.

### Q: What are some rewards?

**Jennifer:** I have a new appreciation for life and death. Never before have I cared so much about people I just met. Something inside of me has opened up since starting residency. It is hard to explain, but I care about my patients in a way I didn't think I would. To be there during a patient's most vulnerable time, to watch as that patient gets better (or sometimes worse) is very powerful and incredibly rewarding.



Andre and Jennifer with Zambian African children.



**Andre:** Being able to effectively figure out what is going on and why someone is sick and then treat the patient correctly will always be exciting and incredibly rewarding. Another very rewarding experience is being able to travel abroad on medical mission trips. I feel lucky that I have been able to go on a few of these trips, and each time when I come home I realize just how fortunate I am. I try to keep that attitude as I see

patients here in the States, knowing that God can reach people through me if I let Him.

**Jennifer & Andre:** We are especially lucky to *both* have the privilege of being physicians and allowing God to use us in the mission field. In April 2013 we traveled to Zambia, Africa, for a month and volunteered with a medical team that included dentists, surgeons, nurses,

and medical technicians. It was such a rewarding experience and one that we were able to share with each other. We hope there are many more to come.

*Andre Castelbuono, '06, graduated from Southern with a BA in biology, minors in chemistry and religion. Jennifer (Cherne) Castelbuono, '08, BSN in nursing.*

## In the Beginning

### Stephen Meyer's Visit



For our Origins Emphasis Week in January, we were privileged to have Stephen C. Meyer as our speaker. Meyer, a former geophysicist and college professor, earned his Ph.D. in history and the philosophy of science from the University of Cambridge. He currently is the director of the Center for Science and Culture at the Discovery Institute in Seattle and is a strong advocate for intelligent design. Meyer has authored numerous articles on these issues and has been a guest on a variety of national television programs. He has written two best-selling books: *Signature in the Cell: DNA and the Evidence for Intelligent Design* and *Darwin's Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design*.

In his presentation for convocation, "The Return of the God Hypothesis," Meyer discussed scientific discoveries about the origin of life and the universe which, instead of undermining faith in God, actually support a theistic belief system.

In his Edgar O. Grundset lecture "Darwin's Doubt," Meyer pointed out that Darwin was aware that his theory of evolution could not explain the Cambrian Explosion, when many different kinds of animals with different

body plans suddenly appeared in the fossil record without evidence of evolutionary ancestors. Darwin was confident that further research would fill in the gaps, but ongoing discoveries have only magnified the problem. Meyer observed that one of the biggest issues in the Cambrian Explosion is that each body plan requires an enormous amount of precise information that is stored in the DNA. The origin of this information through random, undirected evolutionary processes is extremely improbable.

Ranijun Raudo, biology major, commented: "One of the most interesting points that Meyer brought up was that there are many people who believe that Darwin's theory has no weaknesses, despite there being a number of peer-reviewed papers that question parts of the theory.

Another great point . . . is that the huge amount of information needed for functioning biological organisms points to an intelligent designer, much like now computer software points toward an intelligent programmer."

Lee Spencer, Ph.D., a vertebrate paleontologist and retired research professor at Southern, gave Meyer a tour of the Origins hallways and the remarkable hominid collection (fossil ape-men) in the Biology Department. Meyer was enthusiastic about the exhibit and impressed that a small Christian

university has such an outstanding display showing scientific evidence for a creationist worldview. He was especially interested in the concept of Biome Succession as an explanation for the order found in the fossil record. Meyer greatly appreciated the awesome artwork detailing the complexity and intricacy of the cell, which is powerful evidence for an Intelligent Designer.

The Faith and Science Discussion Group, which consists of both religion and science professors from Southern, is currently reading and discussing Meyer's book, *Darwin's Doubt*. A noon luncheon provided an opportunity for a question-and-answer session with the author. While Meyer was speaking, Southern's campus went into lockdown due to a potential threat, causing him to miss the flight to his next speaking engagement. However, it provided time for an interesting discussion of creationist explanations for the hominids and an opportunity for professors to hear stories about some challenges faced by Meyer in his work. Meanwhile, a SWAT team searched the campus as an armed policeman stood guard outside the window. Fortunately, the lockdown ended without incident, and Meyer caught a later flight—after a most memorable experience together for us all!

*By Lucinda Hill-Spencer*



# Undergraduate Research

## Green Genes

For the past several months, we have been working with Biology Department professor, Tim Trott, Ph.D., on a research project that centers on investigating the presence and diversity of Proline-rich protein genes (PRP's) in local angiosperms. Previous research conducted by other scientists confirmed PRPs' presence in the flowering plant, *Arabidopsis thaliana*, and in some grains such as rice and wheat, but not much else is known about them yet. Biology major, Un Ji Byeoun, and I have begun our research project by confirming the presence of PRP sequences in *Arabidopsis thaliana*. This initial phase has involved extracting DNA from plants, designing polymerase chain reaction (PCR) primers, DNA gel electrophoresis, and DNA sequencing. We will then expand this work to additional plant species applying similar methods.

While research experience is certainly a great thing to have when applying to graduate schools, the really neat thing about this project for me

is that it's fun. Having the chance to grow plants and learn biology first-hand not only helps me feel a part of the department, but also enables me to learn in a way that I never could in a class. I like the unknown, the open-endedness. It's funny how after taking care of plants every day for a couple weeks, I have taken ownership of the project.

My research partner, Un Ji Byeoun, puts it this way: "Research and laboratory work in classes are similar yet different. In labs, there are specific answers that we are expected to get. In contrast, in research, no one knows the right answer. In fact, we don't even know whether there is an answer or not. Though this is the part that makes the research challenging, this is the very reason why research is fun and fascinating. Imagine being the first one in history to know a particular something!"

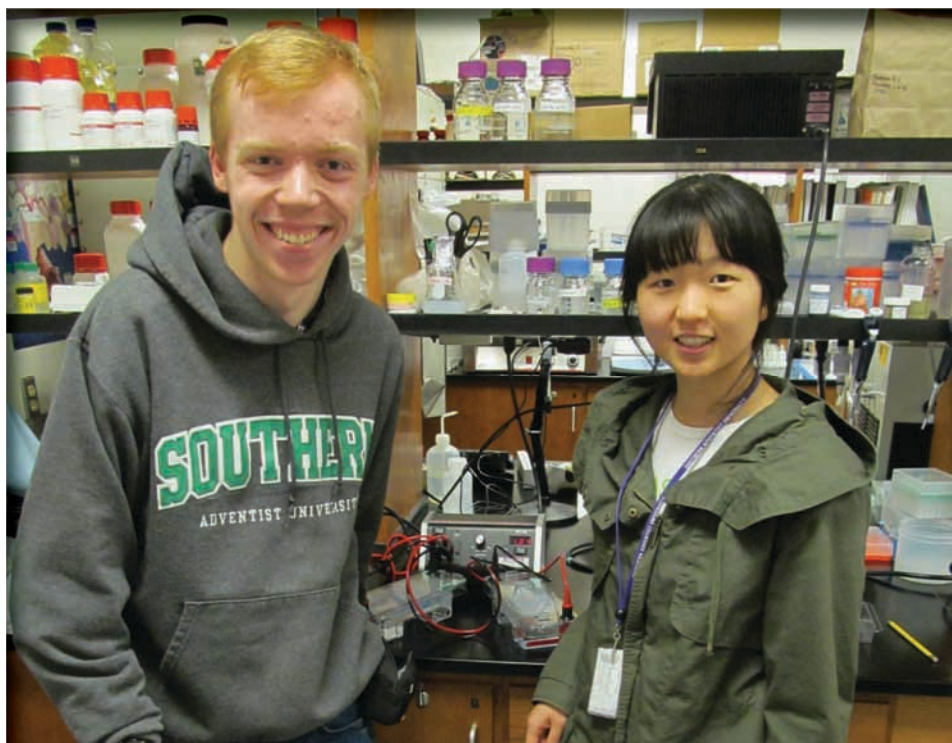
Recently, we prepared some buffers to be used in our upcoming PCR, and because Dr. Trott used terms such as

"pH," "pKa," "dilution factor," and others, I was happy that the knowledge I had gained in General Chemistry was coming into play and good use! Also, Genetics class has helped considerably. I took Genetics last semester from Dr. Trott and enjoyed it so much that I never wanted it to end! That is one of the reasons that I am enjoying this research so much; I feel like the fun of Genetics can continue! Both the theoretical knowledge that I gained in that class, plus practical knowledge regarding techniques, are really coming in handy. For example, even though we studied PCR and electrophoresis in class and labs, actually applying these techniques in a real research setting helps me understand them in a new way.

In conclusion, what I love so much about research and biology as a major is how it helps me learn more and more about how our amazing God has created our world. As Ellen G. White so wonderfully writes in her book "*The Ministry of Healing*," pp. 461-462:

"He who has a knowledge of God and His word through personal experience has a settled faith in the divinity of the Holy Scriptures. . . . To such a student, scientific research will open vast fields of thought and information. As he contemplates the things of nature, a new perception of truth comes to him. The book of nature and the written word shed light upon each other. Both make him better acquainted with God by teaching him of His character and of the laws through which He works."

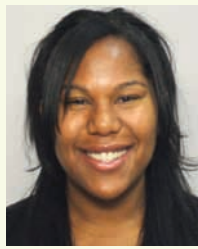
By Austin Menzmer with Un Ji Byeoun



# Allied Health Graduates 2013-2014



Lenard Ang  
AS Physical Therapy



Allison Benjamin  
AS Nutrition/Dietetics



Taylor Cooke  
AS Speech Lang Path



Jordan Core  
AS Physical Therapy



Anh Do  
AS Physical Therapy



Landon Duff  
AS Speech Lang Path



Vanessa Duncan  
AS Physical Therapy



Austin Eldenburg  
AS Physical Therapy



Chelsea Enderson  
AS Physical Therapy



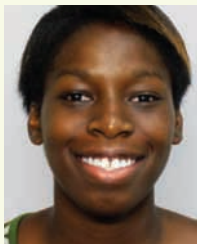
Ashlie Engle  
AS Physical Therapy



Erin Ervin  
AS Speech Lang Path



Brenda Esparza  
AS Speech Lang Path



Sapphira Ford  
BS Medical Lab Science



Anotte Gedeon  
AS Speech Lang Path



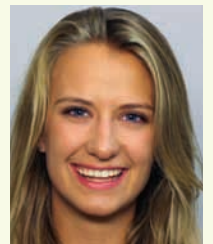
Nazmy Godinez  
AS Speech Lang Path



Christopher Grissom  
AS Physical Therapy



Shehan Guines  
AS Speech Lang Path



Rachel Kearbey  
AS Speech Lang Path



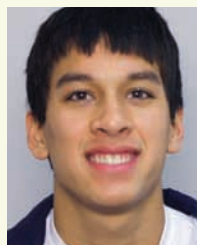
Andrew Kelly  
AS Physical Therapy



Gelline Layson  
BS Medical Lab Science



Kayne Leeper  
AS Physical Therapy



Joshua Ley  
AS Speech Lang Path



Lindsey Leon-Guerrero  
AS Nutrition/Dietetics



Jadel Patterson  
AS Physical Therapy



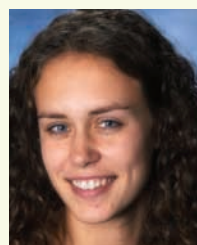
Jordan Powell  
AS Speech Lang Path



La Toya Roberts  
AS Speech Lang Path



Jill Romero  
AS Dental Hygiene



Caroline Rybicki  
AS Physical Therapy



Jacob Sokolies  
AS Physical Therapy



Nicole Strauss  
AS Physical Therapy



Erica Thomas  
AS Occupational Therapy



Keolani Tmetuchi  
AS Occupational Therapy

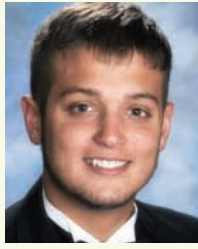
## Congratulations Seniors



## Biology Graduates 2013-2014



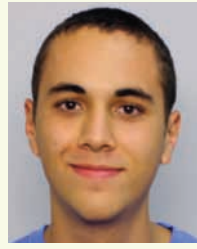
Mario Bacelar  
BA Biology



Devin Bowyer  
BA Biology



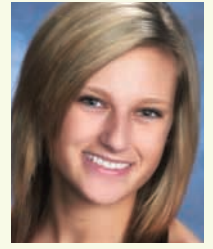
Kelly Claudio  
BA Biology



McKennan Cook  
BA Biology



Leslie Courtad  
BA Biology



Kelsi Curnow  
BA Biology



Jenna Dedeker  
BA Biology



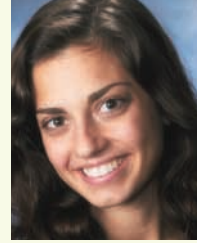
Martha Delgado  
BA Biology



Alexander Erskine  
BS Biomedical



Harrison Filler  
BA Biology



Jeanette Frescino  
BA Biology



Colin Garner  
BA Biology



Adriel Green  
BS Biomedical



Caitlin Harsany  
BA Biology



Sehnyung "Justin" Jang  
BS Biomedical



Joshua King  
BA Biology



Chelsea Mastrapa  
BA Biology



Benjamin Muniz  
BS Biology



Iris Ohsie  
BS Biology



Reuben Plasencia  
BS Medical Science



Jadel Patterson  
BS Biomedical



Jennifer Pauldurai  
BA Biology



Lizabeth Paulino  
BA Biology



Laurel Schuler  
BS Biology



Morgan Smith  
BA Biology



Brianna Taylor  
BA Biology



Michael Weis  
BA Biology

## Department Happenings

### Allied Health Club Visits Bodies: The Exhibition

On February 7, the Allied Health Club took a trip to Atlanta to visit "Bodies: The Exhibition." Twenty-seven students and two faculty members enjoyed the afternoon touring the uniquely preserved human bodies displaying the bodily systems. What a wonderful opportunity to see up close the things that we learn in our Anatomy and Physiology courses! It was a beautiful exhibit done with such care and diligence. It is easy to echo Psalm 139:14: "I praise You because I am fearfully and wonderfully made; Your works are wonderful, I know that full well." Not only were we blessed by the Bodies display, but we were also given the opportunity to tour the adjacent exhibit on the Titanic—for free! The students were also able to grab a bite to eat and explore Atlantic Station before heading back to school for vespers.

By Tony Trimm





Non-Profit Organization  
U.S. POSTAGE  
PAID  
PERMIT NO. 7  
Collegedale, TN 37315



## Department Happenings

### Herbarium Care Transferred to University of Tennessee Museum

The Biology Department transferred care of their herbarium (pressed plant collection) to the Herbarium and Natural History Museum at the University of Tennessee in Chattanooga (UTC) in February 2014.

Much of Southern's herbarium collection was organized by Duane F. Houck, a former professor of biology who passed away in 2003, but his botanical legacy continues. Dr. Houck published an article, "Vascular Flora of Red Clay State Historical Area, Bradley County, Tennessee" in the *Journal of Tennessee Academy of Science* in July 1990. In this article he listed nearly 500 taxa he collected at nearby Red Clay State Park, which was a designated historical area. These plant specimens have been part of Southern's herbarium since.

Joey Shaw, Ph.D., associate professor and well-known botanist at UTC, was introduced to the Southern herbarium when he gave an E.O. Grundset presentation to Southern biology students and faculty. He realized he had discovered Houck's voucher herbarium specimens and knew this was a great addition to regional botanical science. Voucher herbarium specimens are pressed plant samples used for future reference. "I knew these specimens existed, but I did not know what had happened to them," Shaw remarked.

The herbarium collection includes several thousand specimens, some dating back to the 1950s. Not only will this allow active management of Southern's herbarium by the latest

preservation technology, but the collection will soon be available to a much wider audience. Dr. Shaw and several other Tennessee botanists have a national grant pending for imaging and then creating an online database. This will unite all of Tennessee herbaria into a common Tennessee Virtual Herbarium. Southern's collection will now be part of this consortium.

Future Southern students will also have access to the actual plant specimens at UTC should they need these in future research. Discussion is now under way for possible student collaborative research.

By Rick Norskov

