Knobs and Knolls

January 2018

In This Issue

Meet Our Naturalists, Part 1:
Jeremy Stout
Steele Creek Nature Center and Park Manager

By Michele Sparks

(This is the first of three articles featuring the Naturalists that work at The Nature Center. The series will continue in subsequent issues of Knobs and Knolls.)

With Bachelor of Science degrees in Biology and Geology, and a Masters in Vertebrate Paleontology, Jeremy Stout (JS) plays a vital role in the success of the Nature Center. It was fun to sit down with him and find out why he is so passionate about all aspects of Steele Creek Park and its natural history.

MS: How early on did you know that you wanted to be a naturalist?

JS: *Some of my earliest memories are of being outside and wanting to be outside. When I was four or five years old, my mother came to the back yard as I was laying in a hole, totally covered with mud and dirt and throwing it on myself.*

"What in the world are you doing?" she asked. I said "I'm trying to become a fossil."

But it was when I saw a dinosaur for the first time and realized it actually was a real animal, not a make-believe animal, that I began a life-long, intense interest in things that were "old"; I knew right then and there that I wanted to be a paleontologist. That was my first career choice. So, I've always had an interest in science, in things outside, and in things that are old. I've always loved history and the humanities. Although I flirted with archeology for a time, it was the natural world where I wanted to spend my time. I was fairly certain that I wanted to be an academic from the research side, but only accidentally did I find out that I loved the interpretive side through a job with the TN State Parks - one that lasted three summers on Roan Mountain with an additional summer at Warrior's Path Park. The job involved doing programs for the public. That first summer ruined me for good when I realized that being an interpretive naturalist was really where my excitement and fire was. I loved "sharing" it with people.

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Jeremy Stout (continued)

MS: If you could have dinner with a naturalist from the past, who would that be?

***JS**: My hero and primary inspiration was Thomas Henry Huxley, a nineteenth century naturalist from England, early champion of natural selection and friend of Darwin. He spanned so many different fields: microbial life, vertebrates, invertebrates, plants, rocks, and geology. But his legacy and career were so much more than that. He was also one of the first naturalists to bridge the academic elite with the common people through public lectures. He brought science to the people through lay sermons, working tirelessly to educate working men, women, and children. He was from a working class neighborhood and gave it back to the working class neighborhood through education. He had a huge impact on so many. He was ahead of his time in bringing science to the people. He was also a visionary with his scientific contributions, being one of the first to put down the link between dinosaurs and birds which today is now well established. He was saying it at least 60 years before anyone else.*

I also would love to have had the opportunity to sit down with early explorer and naturalist André Michaux, an energetic French botanist best known for discovering and naming hundreds of plants that were new to science. He was actually here in the Southern Appalachians collecting samples of plants and trees to rebuild the forests and countrysides of war-ravaged France with timber and fruiting trees. He reached the summits of Grandfather Mountain (in 1794), Roan Mountain, and the Black Mountains. He stayed with the Carters in Elizabethton and the Tiptons in Johnson City and even lived and traded with the American Indians. You might say that history and natural history met with Michaux and then later with his son. He was just one cool, classic naturalist who made a big impression on me. Even today, if you go to Versailles, you'll find some of the very same species of shrubs and trees that you would find here in this region.

MS: How does understanding the history of the park help people protect it?

***JS**: The past helps us understand the present and also helps us forecast the future because everything is connected. You can't separate any piece out of the natural sciences without taking everything else out with it. Biology is the study of living things, Geology is the study of earth, Astronomy is of space; but you can't understand any of those single areas without understanding the little pieces of many other things. For example, plants still live in the dirt whose chemistry is altered by the bedrock that it grows in and by the microbial life that lives there. It's all tied to where our little planet sits in space and how much light it gets from our closest star. Everything we look at and study separately is really all connected. When you add geology and paleontology to that, it adds the fourth dimension of time. So, we have living and non-living factors that were influenced by how the climate has changed over time and how living things (such as plants) have had to adapt and change to either cope or go extinct. There's no better way to look at where you're going than to look at where you've been.*

There are living species in the woods that don't know that there were once living things "living there" that are now extinct. We once had an ecosystem here at the Park that included mastodons and giant sloths and big predatory cats. While they are now extinct, the present ecosystem here doesn't know that. You can make the case that some of those living things might be native species; but it's interesting to see some plants here in the park like Honey Locust, Kentucky Coffeetree, and Osage Orange - all plants that appear to have been dispersed by giant plant browsers. The giant plant browsers are gone but those plants are still hanging around. Kind of like ghosts from the past having left behind what is still living here today.

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Jeremy Stout (continued)

MS: Now that the Nature Center Exhibits are about half-way complete, what would you like to see more of by way of educational programming at the NC?

***JS**: First and foremost, I want to meet the needs of the community which so graciously funds us. I always want to work closer with our Bristol, TN teachers and administrators to help them fill their needs, either by having the teachers and students come to the NC to take advantage of our new classroom and updated facility, or by our traveling to their classrooms. Friends of SCP has been so helpful to us, not just by funding our new Nature Center exhibits, but by purchasing the skins and skulls and other educational materials we presently use to get out in the classrooms. I also hope Friends will be able to help with the coordination of volunteers in order to increase our programming efforts.*

MS: What, if any plans do you have for bringing back more episodes of "The Explorer" educational videos that so many of us enjoyed?

***JS:** Early on (about 10 years ago), the videos were done more as a taxonomic TV show to focus on specific animals and subjects. Now that the basics are done, I'd like to do more high-level topics such as the one we did on Invasive Species. When you start explaining native vs. non-native species, it's not always clear-cut and it can easily become a more complex subject. Hopefully, we can do more episodes by way of the ecological and geological relationships in order to explore more in-depth information, but always by interpreting what we have here at the park.*

MS: Do your two sons share your love of nature or do they roll their eyes when you insist on taking a frigid family hike on New Year's Day?

***JS**: I'm very thankful that they, as well as their Mom, are my adventure partners. Even in 5 degree weather, most of the boys' complaining was done just getting ready for the hike and then a little bit in the car. Once into it, they're both great outdoorsmen through and through. Let's say, they always have fun when they're there, but it doesn't always start out that way.*

<u>And a few more things you may not know about Jeremy and the Park</u>

His favorite season in the Park might just be winter because it's so beautiful and quiet - but he loves all seasons just about equally.

He doesn't take himself too seriously (as evidenced by the accompanying photo).

In his spare time, Jeremy loves to cook. He creates different dry-rubbed seasonings for the different meats to cook in the smoker, experimenting with different kinds of woods to flavor the meat as well. He makes his own sushi. He loves his cast-iron cookware.

"I don't take myself too seriously!"

Over 11,000 walk-in visitors came through the Nature Center last year. Three to five thousand school kids came through the park for programming via scheduled field trips, all within a four month time-frame. All field trips to the Nature Center address TN State Standards of Learning and SOL's for Virginia students.

Upcoming Nature Center and Park Events

Friday, February2, 4:00 pm -- *Groundhog Day Hike*
Meet Don at the Nature Center for a fun walk to learn about, not just these fascinating animals, but also the cosmic importance of this seemingly silly holiday!

Friday, February16, 3:30 pm -- *Great Backyard Bird Count Feeder Watch*
Meet Don at the Nature Center to engage in citizen-science while learning about bird-watching and taking part in this nation-wide count!

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Saturday, March 10, 8:30 am – 2:00 pm -- *Tree Keepers Seminar!*
Join us for a day filled with practical workshops and interesting topics, all about plants! A light breakfast and lunch will be served and door prizes will be awarded. There is a $10 fee for this event. Call 423.764.4023 for more information or to sign up!

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Friday, March 16, 10:00 am -- *Spring Migration Bird Walk*
Hearing is believing… and oh yeah, so is seeing! Meet Don at the Nature Center for a moderate walk looking for migrating songbirds, waterfowl, hawks and more!

Friday, March 23, 4:00 pm -- *Spring Wildflower Walk*
Meet Jeremy at the Nature Center for an easy walk looking for some of the first living gems of the warmer months. This walk will focus on the quick-blooming ephemerals and could be an excellent photo opportunity!

Saturday, March 31, 5:30 pm -- *Rooster Front Wetland Walk*
Meet Lance at Rooster Front Park (located just off Vance Drive) for a trip around and into the park's wetlands in search of frogs, toads, snakes and more! Please wear shoes that can get a little wet and muddy!

Saturday, April 14, 5:00 pm -- *Creepy Crawlies Hike*
Meet Lance at the Nature Center for a log-rollin' trip into Hemlock Hollow searching for some of the many creepy crawlies that call it home!

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Saturday, April 21, 9:00 am - Noon -- *Earth Day Lake Cleanup!*
Join park staff and the Friends of Steele Creek Nature Center and Park at the Nature Center for a clean-up of our park! Bags, gloves, and refreshments will be provided.

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Saturday, May 5, 5:00 pm -- *Mammals and Animal Tracking*
Meet Lance and guest naturalist Ron Peery at the Nature Center classroom for a short talk on our region's furry friends; then take an easy walk looking for the signs they leave behind.

Friday, May 25, 4:00 pm -- *Spring Butterfly Foray*
Meet Don at the Nature Center for an easy hike looking for these warm-weather gems of the skies. Bring a camera if you have one!

Speedway Children's Charities Grant

Support for Special Nature Camp Session

Thanks to a generous grant from the Bristol's Speedway Children's Charities, Friends will again be sponsoring a special one week Nature Camp session for children from the Boys and Girls Club. This is the second year that we have provided funding to allow these kids to attend the camp for free. The experience last year was so positive that, with increased support from SCC, we plan to expand the opportunity to 20 children (up from 14 last year).

To enhance the value of this special camp experience, longer daily sessions (than the usual Nature Camp program) will again be provided, and nutritious daily lunches and afternoon snacks will be provided for all participants. The campers will engage in a wide variety of outdoor activities designed to introduce them to the natural environment of our region, its habitats, and its ecology. The curriculum is designed to stimulate their curiosity about the natural world around them. Funding from Friends will pay for the lunches and afternoon snacks and special camp T-shirts for all campers, and expendable materials that are used during the camp sessions.

Last year, staff and campers alike were enthusiastically positive about the experience. A few quotes and photos sum up the value of the program better than any further description. "I've been to camps all summer, and this one's my favorite!" [Camper, age 11]. "I wish we could do this everyday!" [Camper, age 10]. "I've enjoyed this session more than any we've had before; all of the campers were incredibly engaged and enthusiastic!" [Nature Center staff].




2018 Summer Nature Camps

Paleontology Camp, Age 7 – 9 (June 4 – 8)
Aquatic Ecology, Age 10 – 12 (June 11 – 15)
Nature Photography Camp, Age 10 – 12 (June 18 – 22)
Web of Life Camp, Age 7 – 9 (June 25 – 29)
Insects and Creepy Crawlies Camp, Age 7 – 12 (July 16 – 20)

The Camp fee is $60 per camp, per child ($50 if paid before May 25, 2018). Partial camp scholarships are available upon a need-based request. For more information, call the Nature Center at 423-989-5616, or email jstout@bristoltn.org.

Keep an eye out for the official summer camp flyer, coming soon!

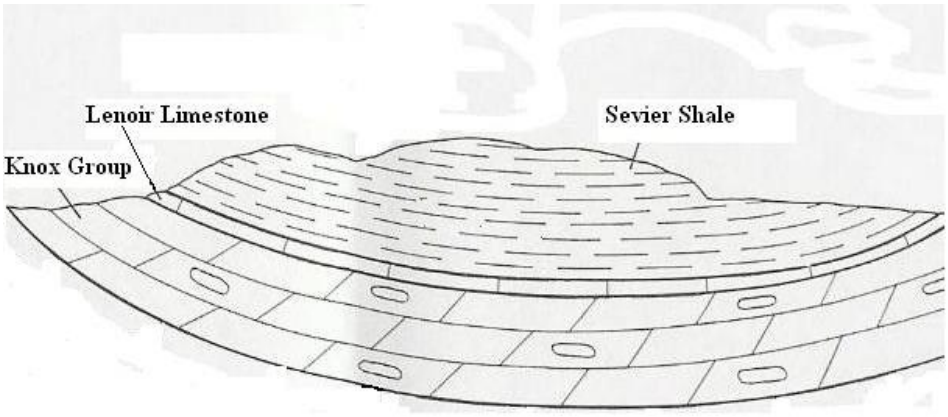
Basic Geology of Steele Creek Park

By Jeremy Stout

Have you ever wondered why Steele Creek Park's golf course is made up of gently rolling hills but the hiking trails are some of the steepest around? Why did Bristol grow up around the Park in its early days instead of sprawling into it as available land? These and other questions about the Park's and surrounding landscape can be answered with just a few notes about the underlying geology.

All of the rock units in the park (and, for that matter, in the region) are sedimentary. Sedimentary rocks are those that have formed from the accumulation and cementation of sediments like sand and mud, which form sandstone and shale respectively. Limestone is made up of very special kinds of sediments, the microscopic fossilized shells of planktonic creatures! Shale and limestone make up all of surface bedrock in Steele Creek Park.

Basically, all 2,200+ acres of Steele Creek Park can be summed up in three major geological units, each stacked atop another. The bottom unit is the Knox Group, overlain by the much thinner Lenoir Limestone, with the Sevier Shale on top. See the cross-sectional diagram below for a nice view of the park's geologic profile.



Adapted from the "Geologic Map and Mineral Resources Summary of the Bristol Quadrangle, Tennessee"
TDEC Division of Geology, 1998

The "Knox Group" actually refers to several different rock types of Upper Cambrian to Lower Ordovician age that occur in the region. This unit is found throughout much of the Northeastern portion of Steele Creek Park. Though this group contains other rock types, limestone and dolomite (a very similar rock to, and formed from, limestone) characterize the Knox at the park. There are not many outcrops to readily observe, but the sinkholes that dot the multi-use fields are testament to the carbonate bedrock underneath!

While walking along the beach below the Nature Center and Lodge, it is impossible not to notice the large, blue-gray boulders jutting up from the ground. This is one of the few places in the park, as well as in the area, you can see the Lenoir Limestone! These boulders are beautifully rounded due to a form of chemical erosion. Limestone and dolomite are soluble in water, and over time ordinary rainwater will actually dissolve these rocks, leaving smooth and rounded outcrops. This is the same process by which caves and sinkholes form.

Lenoir Limestone outcroppings visible below the NC

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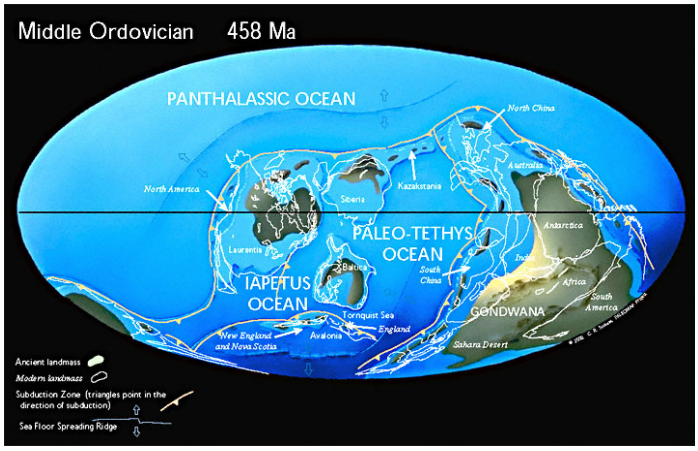
Basic Geology of Steele Creek Park (Continued)

Finally, when hiking the Park's trails through the ridges and ravines, you will undoubtedly notice the shale of the Sevier Formation. This is the brown, crumbling rock that can peel apart to nearly paper-thin sheets. Not nearly as susceptible to erosion by water (**chemical weathering**), shale is very brittle and quite weak to **physical weathering** (breaking apart). This is why the fragments you find are nearly always very angular in shape. This is the thickest and topmost rock unit in the Park, but also makes up the majority of the Park's bedrock land area. Some units of the Sevier have a dark gray coloration (called *black shale*), and for this reason is often misidentified as *slate*.

So how did these marine rocks end up as ridges and valleys?

All of the rock units in Steele Creek Park are **Ordovician** in age, deposited approximately 450 million years ago. At that time the newly-forming rocks that would later constitute Steele Creek Park were south of the Equator and under the Iapetus Ocean, which covered much of what is now North America. The three major rock units of Steele Creek Park were deposited in warm, relatively shallow seas.



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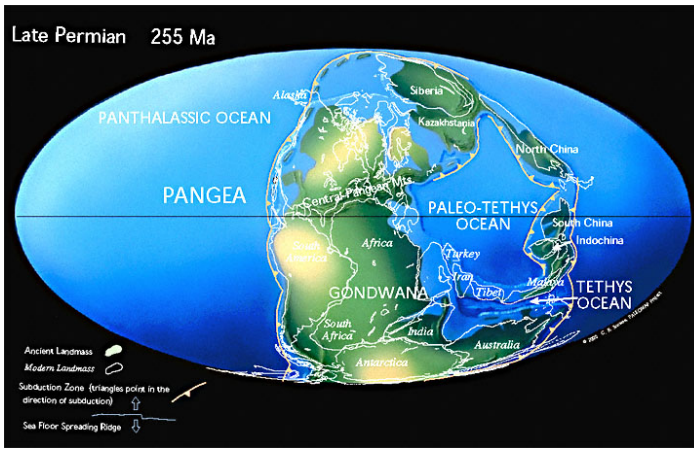

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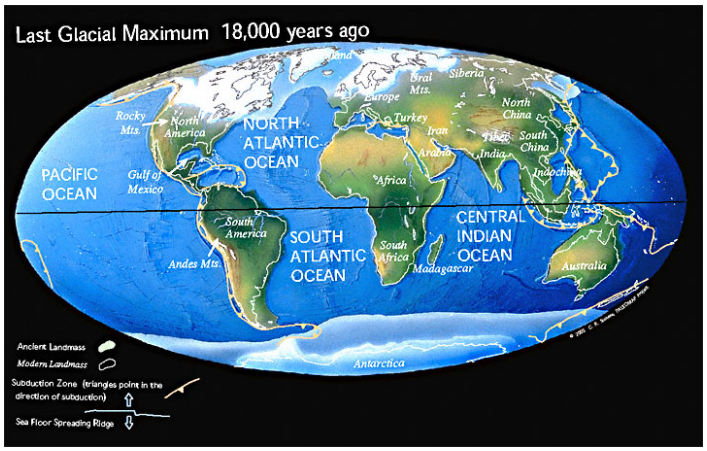
The crust of the Earth is dynamic, of course, and in the late Permian Period (at the end of the Paleozoic Era), the African proto-continent (being driven by **plate tectonics**) scooped up smaller subcontinents and collided with the future North America. This collision resulted in the formation of the supercontinent Pangaea and caused a tremendous amount of uplift at the North America/Africa impact site creating the Appalachians, which at the time were one of the tallest mountain ranges to ever have existed. A mountain-building event is called an **orogeny**.

Pangaea broke apart shortly after its creation and the Appalachian region of North America has been geologically passive since. Weathering and erosion have beat down the once-giant mountains, exposing the Paleozoic ocean rocks that we see in Steele Creek Park today. The following image shows the Earth 18,000 years before present during the Pleistocene "Ice Age" when the Earth was cooler, but the continents' positions were essentially the same as today.

More on Steele Creek Park's Ice Age next time!



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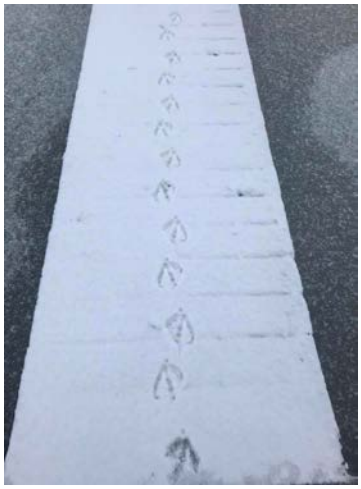
Paleomaps provided by: Scotese, C. R., 2001. Atlas of Earth History, Volume 1, Paleogeography, PALEOMAP Project, Arlington, Texas, 52 pp.

Winter Scenes at Steele Creek Park



You can keep up with what's going on at the Park and with *Friends* by liking us on Facebook (FriendsOfSteeleCreekPark) or by following our webpage at https://www.friendsofsteelecreek.org.

We appreciate feedback about our communication. Let us know if you find these newsletters interesting and/or useful. If you have suggestions for topics to be covered, or other formats that we could use, let us know by e-mail at mail@friendsofsteelecreek.org.

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