

Tar Heel Tailings

Special Interest Articles:

- Prez Sez
- History of Fossils in North Carolina
- New three-foot-tall relative of Tyrannosaurus rex

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A newsletter for Gem and Mineral enthusiasts in and around the Raleigh, North Carolina area.

Prez Sez

By Anthony Andreoli

Hello All,

At this month's meeting The Challenger Family will be doing a presentation on Mineral Identification. They will be using a special instrument that can ID certain minerals. It will be explained how it works and there may be time for some members to possibly get a specimen identified.

Beverly will be bringing food this month and Renny will providing beverages. The UV flashlights will be at the meeting again as well for those interested in purchasing them. We only have 9 left!

Lastly, we have been asked to be included in the Museum of Life and Sciences Paleontology event in August. They would like us to set up a table for the day and be able to talk to all visitors about our club and what we are all about. We will be looking for a few volunteers to man the table. I will be discussing more at the meeting.

Thank you, See you all on June 18th!!!

Anthony Andreoli, President
Anthony Andreoli, President, Tar Heel Gem and Mineral Club, Inc.

History of Fossils in North Carolina and Where to Find Them Today



Credit: Richie Kurkewicz
Fossil Crab Avitelmessus grapsoides Peedee Formation, North Carolina. Specimens of this quality are extremely rare with only a few existing in private or public collections. Of those few, this is one of, if not, the single, best this writer has ever seen (very hard matrix- this is a superior preparation). Our ace preparator, Rod Bartlett of B.C. Canada invested 60 hours of meticulous air abrasion into this masterpiece.

A well-known rock-hounding state, North Carolina is also a fun place to add fossils to your collection, if you know where to look. Fossils are more prevalent in the eastern half of the state, as the forces of "volcanism and metamorphism" associated with the mountains destroy fossils. Other limiting factors include the prevalence of vegetation, that drives the formation of soil (breaking down rock and fossils), and the fact that North Carolina has higher population than some western states, meaning that potential fossil sites are paved over. It is rare to find dinosaur fossils from the Triassic and Jurassic periods, and that relates to the way the supercontinent of Pangea separated.

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We're on the Web!
See us at:
www.tarheelclub.org

Program & Refreshments

REFRESHMENT SCHEDULE:

Coordinator: Open

June: Beverly House
Beverages: Renny Young

PROGRAM SCHEDULE:

January - Tom Todaro- Safety Briefing
February – Michael Frankilin
March - Grab Bags / Postcards
April - Post-show Discussion
May - Jeff Schlottman-Digging the Guibault Claim
June - The Challenger Family- Mineral Identification
July - TBA
August - Cathy Young
September – Paul Byrne
October - Grab Bags
November – Election

Remember, the club will reimburse you for up to \$85 (bring your receipts to the treasurer).

May's Treasurer Report
will appear along with June's
report in next issue.

June B-Day Members

Vickie McKay
Seward Shaddock
Tammy Smith
Joel Pratt
Clea Gallian
Sue Heneghan



Membership applications may be mailed to:

Tar Heel Gem & Mineral Club, Inc.
Attention: Treasurer
PO Box 33783,
Raleigh, NC 27636-3783

Tar Heel Gem and Mineral Club, Inc. – May Meeting Minutes

May 21, 2019
7:30pm

Attendees: 31
Birthdays: 3 (Corrinne was celebrating her 82nd Birthday)

Food: No volunteer for food at this month's meeting. Renny provided beverages.

Meeting called to order at 7:30pm by Anthony Andreoli, President.

Presentation: Jeff Schlottman did a presentation on "Digging the Guibault Claim" in Hiddenite, NC. He showed slide of the progress that have made over the years at the claim, as well as many of the treasures they have unearthed there. It was also brought up to have the club possibly visit the claim for a future field trip.

Discussion: New membership was discussed regarding new members who joined at the show. Karen has put in all new member forms she has received and created user names and temporary passwords for all accounts. It was brought up that at next year's show tablets should be provided in order to make the sign-up process less difficult, and to avoid any possible forms being lost or misplaced.

UV flashlights were offered to those who were interested. Still 9 lights remaining. They will be brought to the June meeting as well.

William Holland/Wild Acres Trip Drawings

Trip 1

Winner: Kim W.
1st Runner up: Joshua S.
2nd Runner up: Lilly A.
3rd Runner up: Gene H.
4th Runner up: Lindsey B.

Trip 2

Winner: Obsidian H.
1st Runner up: Renny Y.
2nd Runner up: Cyndy H.
3rd Runner up: Tom B.
4th Runner up: Daniel C.

Door Prize Winner: Deborah M.

Next Meeting: Tuesday June 18, 2019 7:30pm

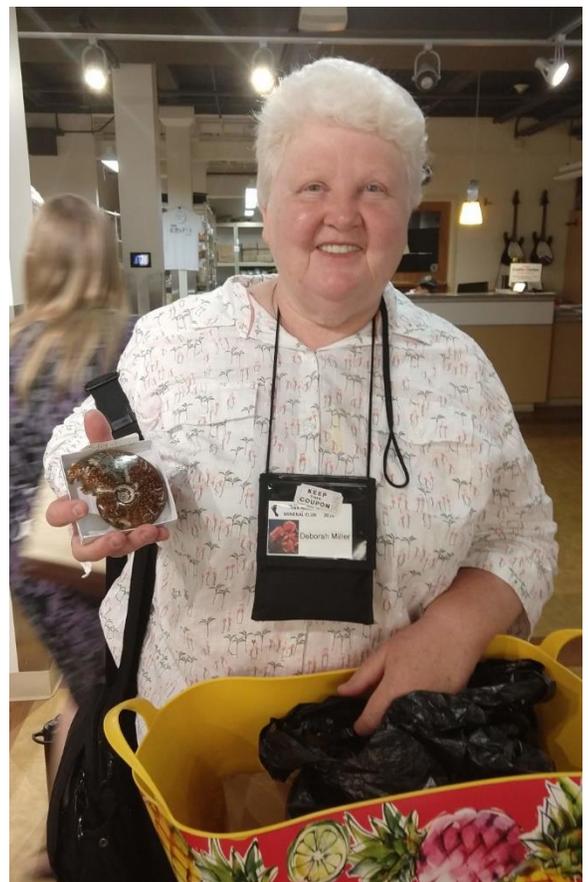
Respectfully Submitted,

Lilly Andreoli
(Substitute Secretary for May meeting)
Tar Heel Gem and Mineral Club, Inc.



Above: Jeff Schlottman tells us about the Guibault Claim

Below: Deborah M shows off her fossil nautilus



Continued from page 1

As the east coast of North America split away from Africa, the Atlantic Ocean formed in the chasm in between. The North Carolina coast was formed not by the existing land simply drifting westward, but by a coastline of “extremely high” cliffs rapidly eroding into the gently sloping coastline we know today. By the late Cretaceous, the coastline was worn down enough that sediments from rivers began to build up, preserving fossils once again. It’s also important to note that since the Precambrian period, NC was flooded by the ocean many times. Even during the Mesozoic, when those high cliffs were still eroding away, “rift basins” filled with fresh water, and the sea sometimes covered areas that are dry land today. Many of the fossils available to be found in North Carolina are the remains of marine organisms because of this.

Despite the relative lack of dinosaur fossils in NC, there are few notable dinosaur finds. North Carolina’s second state geologist made the US’s third ever dinosaur fossil discovery in the 1860’s. He found a tail vertebra and other bones from a duck-billed dinosaur in a “marl pit” in Sampson County. A marl pit consists of a white clay made of fossils, that was traditionally mined for fertilizer. The teeth of *Pekinosaurus*, a “small plant-eating dinosaur,” were found in Pekin, NC. These are some of the oldest dinosaur fossils ever recovered. A similarly ancient set of footprints were found in a mudstone quarry on the North Carolina-Virginia border near Leaksville Junction. The prints belonged to carnivorous *Grallator*, walking on 2 legs, and quadrupedal *Atreipus*, a primitive dinosaur. The most prolific site of Cretaceous dinosaur fossils is Phoebus Landing in Bladen county. There, the Black River Group geological formation is exposed. However, it seems

“no one has ever collected bones from the same animal” at this site, and it has been pretty thoroughly picked over at this point.

Today, amateur fossil hunters can search rivers and streams, but may have the most luck in quarries (which expose material located deep enough to be protected from the effects of the soil-formation process mentioned above). Rufus Johnson of Carolina Country Magazine attests that he has found fossils in the “Cape Fear, Chowan, Meherrin, Roanoke, and Tar rivers.” He also recommends the marl pits of Pender County, in which can be found shells and fish or whale teeth. A marl pit near Aurora, NC has also produced a variety of sand dollars, urchins, and whale and seal bones. Notable in this area is the Aurora Fossil Museum. Across the street from this museum, visitors may search through the tailings of a local phosphate mine for free. Fossil coral, shells and shark teeth are abundant at this site! For petrified wood, Johnson advises a search in Edgecombe, Halifax, Northampton, or Johnson counties. The Pekin formation (of *Pekinosaurus* fame) in Chatham county “is famous for finely detailed plant fossils” as well as fish, amphibian and crocodile-like reptile fossils. This fossil layer was exposed by coal mining during the civil war.

Sources:

<https://www.ncpedia.org/fossils>

<https://www.ncpedia.org/marl-beds>

http://paleoportal.org/index.php?globalnav=time_space§ionnav=state&name=North%20Carolina

<https://www.carolinacountry.com/carolina-stories/fossils-in-north-carolina>

<http://aurorafossilmuseum.org/post/9/vertebrate-fossils.html>



Image: Fossil shark teeth and shells collected in Aurora, NC, featuring 2-inch *Megalodon* tooth (center). From newsletter editor’s collection.

New three-foot-tall relative of Tyrannosaurus rex

By Science Daily



*Sterling Nesbitt and fossil remains of Suskityrannus hazelae, which he found at age 16 in 1998.
Credit: Virginia Tech*

A new relative of the Tyrannosaurus rex -- much smaller than the huge, ferocious dinosaur made famous in countless books and films, including, yes, "Jurassic Park" -- has been discovered and named by a Virginia Tech paleontologist and an international team of scientists.

The newly named tyrannosauroid dinosaur -- *Suskityrannus hazelae* -- stood roughly 3 feet tall at the hip and was about 9 feet in length, the entire animal only marginally longer than the just the skull of a fully grown Tyrannosaurus rex, according to Sterling Nesbitt, an assistant professor with Department of Geosciences in the Virginia Tech College of Science. In a wild twist to this discovery, Nesbitt found the fossil at age 16 whilst a high school student participating in a dig expedition in New Mexico in 1998, led by Doug Wolfe, an author on the paper.

In all, *Suskityrannus hazelae* is believed to have weighed between 45 and 90 pounds. The typical weight for a full-grown Tyrannosaurus rex is roughly 9 tons. Its diet likely consisted of the same as its larger meat-eating counterpart, with *Suskityrannus hazelae* likely hunting small animals, although what it hunted is unknown. The dinosaur was at least 3 years old at death based on an analysis of its growth from its bones.

The fossil dates back 92 million years to the Cretaceous Period, a time when some of the largest dinosaurs ever found lived.

"*Suskityrannus* gives us a glimpse into the evolution of tyrannosaurs just before they take over the planet," Nesbitt said. "It also belongs to a dinosaurian fauna that just precedes the iconic dinosaurian faunas in the latest Cretaceous that include some of the most famous dinosaurs, such as the Triceratops, predators like Tyrannosaurus rex, and duckbill dinosaurs like Edmontosaurus."

The findings are published in the latest online issue of *Nature Ecology & Evolution*. In describing the new find, Nesbitt said, "*Suskityrannus* has a much more slender skull and foot than its later and larger cousins, the Tyrannosaurus rex. The find also links the older and smaller tyrannosauroids from North America and China with the much larger tyrannosaurids that lasted until the final extinction of non-avian dinosaurs.

(Tyrannosaurus rex small arm jokes abound. So, if you're wondering how small the arms of *Suskityrannus* were, Nesbitt and his team are not exactly sure. No arm fossils of either specimen were found, but partial hand claws were found. And, they are quite small. Also not known: If *Suskityrannus* had two or three fingers.)

Two partial skeletons were found. The first included a partial skull that was found in 1997 by Robert Denton, now a senior geologist with Terracon Consultants, and others in the Zuni Basin of western New Mexico during an expedition organized by Zuni Paleontological Project leader Doug Wolfe.

The second, more complete specimen was found in 1998 by Nesbitt, then a high school junior with a burgeoning interest in paleontology, and Wolfe, with assistance in collection by James Kirkland, now of the Utah Geological Survey. "Following Sterling out to see his dinosaur, I was amazed at how complete a skeleton was lying exposed at the site," Kirkland said.

For much of the 20 years since the fossils were uncovered, the science team did not know what they had.

"Essentially, we didn't know we had a cousin of *Tyrannosaurus rex* for many years," Nesbitt said. He added the team first thought they had the remains of a dromaeosaur, such as *Velociraptor*. During the late 1990s, close relatives *Tyrannosaurus rex* simply were not known or not recognized. Since then, more distant cousins of *Tyrannosaurus rex*, such as *Dilong paradoxus*, have been found across Asia.

The fossil remains were found near other dinosaurs, along with the remains of fish, turtles, mammals, lizards, and crocodilians. From 1998 until 2006, the fossils remain stored at the Arizona Museum of Natural History in Mesa, Arizona. After 2006, Nesbitt brought the fossils with him through various postings as student and researcher in New York, Texas, Illinois, and now Blacksburg. He credits the find, and his interactions with the team members on the expedition, as the start of his career.

"My discovery of a partial skeleton of *Suskityrannus* put me onto a scientific journey that has framed my career," said Nesbitt, also a member of the Virginia Tech Global Change Center. "I am now an assistant professor that gets to teach about Earth history."

The name *Suskityrannus hazelae* is derived from "Suski," the Zuni Native American tribe word for "coyote," and from the Latin word 'tyrannus' meaning king and 'hazelae' for Hazel Wolfe, whose support made possible many successful fossil expeditions in the Zuni Basin. Nesbitt said permission was granted from the Zuni Tribal Council to use the word "Suski."

Virginia Tech. "New three-foot-tall relative of *Tyrannosaurus rex*." ScienceDaily. ScienceDaily, 6 May 2019. <www.sciencedaily.com/releases/2019/05/190506111431.htm>.

New mineral classification system captures Earth's complex past

By Science Daily

The first minerals to form in the universe were nanocrystalline diamonds, which condensed from gases ejected when the first generation of stars exploded. Diamonds that crystallize under the extreme pressure and temperature conditions deep inside of Earth are more typically encountered by humanity. What opportunities for knowledge are lost when mineralogists categorize both the cosmic travelers and the denizens of deep Earth as being simply "diamond"?

Could a new classification system that accounts for minerals' distinct journeys help us better understand mineralogy as a process of universal and planetary evolution?

The current system for classifying minerals -- developed by James Dwight Dana in the 1850s -- categorizes more than 5,400 mineral "species" based on their dominant chemical compositions and crystalline structures. This is an unambiguous, robust, and reproducible designation scheme.

Carnegie's Robert Hazen suggests an additional classification system, which could amplify existing

knowledge of how minerals evolve over time without superseding the existing designations. In American Mineralogist's Roebling Medal Paper, Hazen argues for categories that reflect a deeper, more-modern understanding of planetary scale transformation over time.

A system grouping minerals and non-crystalline natural solids -- which are not currently classified by the existing system -- into what Hazen calls "natural kind clusters" would better reflect the inherent messiness of planetary evolution, he explains.

"For maximum efficacy, scientific classification systems must not just organize and define, but also reflect current theory, and allow it to expand and guide us to new conclusions," Hazen says.

He pioneered the concept of mineral evolution -- linking an explosion in mineral diversity to the rise of life on Earth and the resulting oxygen-rich atmosphere. Hazen then added another layer to his vision by introducing mineral ecology -- which analyzes the spatial distribution of Earth's minerals to predict which ones remain undiscovered and to assert our planet's mineralogical uniqueness.

A system of categorization that reflects not just a mineral's chemistry and crystalline structure, but also the physical, chemical, or biological processes by which it formed, would be capable of recognizing that nanodiamonds from space are fundamentally different to diamonds formed in Earth's depths.

The existing classification system groups some minerals with disparate formation histories together in one category, while splitting others with similar origin stories into separate mineral species.

Another example: currently 32 different mineral species of the "tourmaline group" are delineated by the distribution of the major elements of which they are comprised. So, a single shard of tourmaline with slight variations in chemistry often contains multiple species of the mineral, even if they all formed in the same geologic event.

A natural kind classification system would rectify that problem, and allow for the inclusion of non-crystalline materials, such as volcanic glass, amber, and coal, which currently aren't counted as

minerals, but can offer knowledge about our evolving planet.

"Earth's mineralogy tells vivid stories, revealing how eons of geologic activity and the rise of life facilitated novel combinations of elements," Hazen argues. "But to glean every nuance of this mineralogical text, we must embrace a new language for describing the creation of minerals that reflects the passage of time."

This publication is a contribution to the Deep Carbon Observatory. Studies of mineral evolution and mineral ecology are supported by the Deep Carbon Observatory, the Alfred P. Sloan Foundation, the W.M. Keck Foundation, the John Templeton Foundation, the NASA Astrobiology Institute, a private foundation, and the Carnegie Institution for Science.

Carnegie Institution for Science. "New mineral classification system captures Earth's complex past." ScienceDaily. ScienceDaily, 3 June 2019. <www.sciencedaily.com/releases/2019/06/190603124552.htm>.

UPCOMING SHOWS

July 5—July 7, 2019 — Treasures of the Earth Gem, Mineral & Jewelry Show—Our shows feature estate, classic, handcrafted and fashion jewelry made from a variety of metals, as well as a vast array of crystals, minerals and fossils. Jewelers and wire wrappers will be on site who can design, remount or repair jewelry.

Promoter:

Treasures of the Earth, Inc.

Ellen White

(804) 642-2011

Ellen@treasuresoftheearth.com

<http://treasuresoftheearth.com/>

North Carolina State Fairgrounds—1025 Blue Ridge Road, Raleigh, North Carolina 27607

Park in the Cates Ave. Parking Deck off Jensen Dr. Enter Thompson Building directly across from the parking lot.

Our Next Meeting is

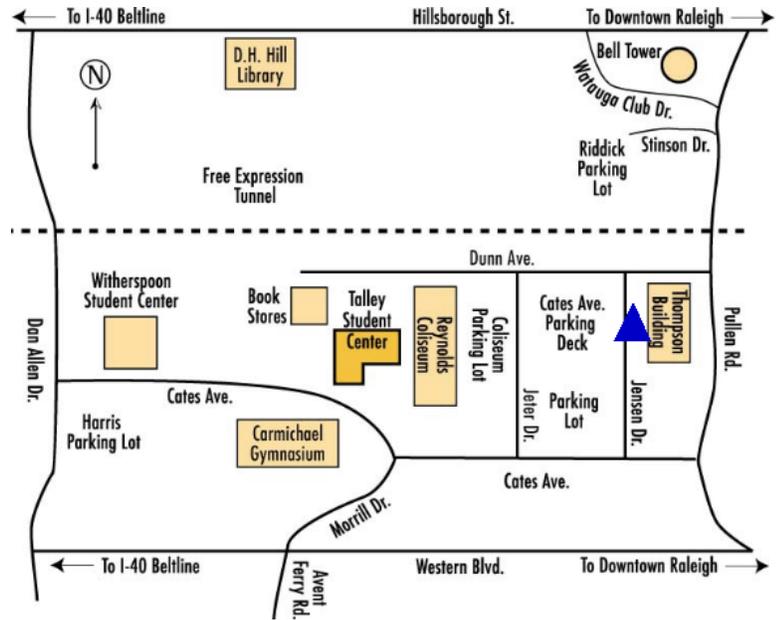
June 18, 2019 @ 7:30PM

Thompson Building / NCSU Campus.

About Our Organization...

The Tar Heel Gem and Mineral Club, Inc. was formed in 1974 as a nonprofit educational organization for people who enjoy the lapidary arts, earth sciences, and related subjects. The main objectives of the club are to investigate, preserve, and share knowledge of rocks, minerals, and precious stones, and to promote interest in mineralogy, paleontology, earth sciences, and lapidary techniques, among club members and among the general public. The club pursues these goals through publications, meetings, lectures, field trips, exhibits, demonstrations, and other activities.

Come and be a part of the Fun!



TAR HEEL GEM & MINERAL CLUB
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