September, 2017
Volume 45, Issue 09

Tar Heel Tailings

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

Special Interest Articles:

Individual Highlights:

Prez Sez

By Melissa Whitfield

Dear Members,

I wanted to thank all the volunteers and members who made our Kid's Night such a success! We had 18 very enthusiastic kids (and their families) show up for our event. It was a fun and enjoyable time as the kids walked around our event tables with their grab bags. Special thanks to Dr.Mike for hosting a great informational table, Cyndy Hummel for running the "What's This" table and fielding ALOT of questions,

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Canadian Sapphires Fit For A Queen Now Unearthed

From ScienceDaily

New research from UBC mineralogists could make it easier to find high-quality Canadian sapphires, the same sparkling blue gems that adorn Queen Elizabeth II's Sapphire Jubilee Snowflake Brooch.

The so-called Beluga sapphires were discovered near Kimmirut, Baffin Island, Nunavut by brothers Nowdluk and Seemeega Aqpik in 2002. The location is Canada's only known deposit of sapphires. The gems form the basis of the ceremonial brooch given to the Queen last week by Canada's Governor General David Johnston.

"These occurrences are the first reported sapphires hosted in this type of marble-related deposit," says Philippe Belley, a graduate student at the University of British Columbia. "We've discovered that it takes a fairly specific sequence of pressure and temperature events to create these gems. It's essentially a recipe."

Belley, UBC mineralogist Lee Groat, and colleagues, outline the findings in the July issue of the Canadian Mineralogist,

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Tar Heel Gem & Mineral Club, Inc.

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

Membership applications may be mailed to:

Tar Heel Gem & Mineral Club, Inc.
Attention: Treasurer
10609 Chelsea Drive
Raleigh, NC 27603

Program & Refreshments

REFRESHMENT SCHEDULE:
Coordinator: Loretta Turcotte
(919) 771-6366

September	TBD

PROGRAM SCHEDULE:

September	Fletcher McDonald-Micro-mineral Collecting and Preparation
October	Nominations, Grab Bags
November	Elections

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

September Treasurer's Report

Jul. Ending / Aug. Beginning Balance	$11,633.29
Deposits (+)	
Gem Auction	$655.00
Members	49.00
Sub total	$704.00
Checks Written (-)	
Office Supplies	$189.23
Field Trips	100.00
Newsletter	85.37
Sub Total	$374.60
Aug. Ending / Sep. Beginning Balance	$11962.69

September
B-Day Members

James Adams
James Bilou
Eileen Breckstein
Michael Collins
Susan Draeger
Ken Fersch
Mike Franklin
Richard Garabedian
Mary Harbison
George Harris
Alexandra Helms
Patricia Jackson
Randy James
Louis Kahler
Brandon LaPiana
Gary McCutchen
Susan McMillan
Karen Santala
Linda Searcy

Tar Heel Gem and Mineral Club, Inc. - August Meeting Minutes

Tuesday, August 15, 2017

Attendees = ?????

Opening of Club Meeting:

The President Melissa Whitfield opened the meeting at 7:00pm.

Program:

Kids night for August 15 – 7:00pm – 8:30pm – many children and parents attended.

Auction:

Auction started about 8:30pm. Many gemstones went on the auction block.

Refreshments:

Ice Cream Social

Door Prize:

The Winner is: All kids won some type of prize. Alfredo Strange won some faceting rough (Danburite, Citrine, Blue Topaz, Peridot, Tourmaline).

Close of Meeting:

Meeting ended ~9:30pm.

Respectfully Submitted
Linda Searcy,
Secretary, Tar Heel Gem and Mineral Club, Inc.

Prez Sez

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and Tom Todaro for his "Field Trip" table and the "Door Prize" drawing that allowed all the kid's to pick a specimen from his field trip collection. We had a lot of new people visit us but more importantly I think we really sparked the interest of these kid's in gems and minerals.

With balloons, and ice cream that followed, the kids and their parents really had a good time. And many parents stayed around and bid in our auction which did really well. The cut gems were fantastic!

Of course, when all is said and done the people I rely on the most are the volunteers who help me set up for the event and then those who clean up and put food, minerals, chairs and tables away after our event. Everyone was so cheerful and as far as clean up goes so efficient that we were out before the 10pm craft center closing. A real accomplishment given everything we had going on that evening.

It's our volunteers that make our club what it is. They work tirelessly behind the scenes to support the club and its activities. We couldn't operate without them. If you love the club but haven't volunteered please consider how you can use your special skills to contribute and keep us going strong.

Thank you,
Melissa Whitfield
President
Tar Heel Gem and Mineral Club, Inc.

Canadian Sapphires Fit For A Queen Now Unearthed

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where they discovered the unique recipe of pressure and temperature events from Earth's history that were required to form sapphires in this area.

The researchers compared this information to regional data to pinpoint the most promising areas for sapphire exploration. Those areas are expected to occur near a fault that separates the Lake Harbour Group and Narsajuaq terranes. A terrane is a fault-bounded area or region with a distinctive stratigraphy, structure, and geological history.

"This research has enabled us to identify the areas of greatest potential for Kimmirut-type sapphire deposits in southern Baffin Island, which will facilitate gemstone exploration in this part of the Arctic," says Groat, a UBC expert on gem deposits. "But it's also a deposit model that can be applied to exploration worldwide."

Sapphires are usually cut and polished into gemstones for jewelry. The Beluga sapphires are typically a striking blue, but are sometimes yellow or colourless. The Queen's Sapphire Jubilee Snowflake Brooch consists of 48 Beluga sapphires, along with 400 diamonds from northern Canada, all set in Canadian white gold. Sapphires range in price from US$200 to $2,000 per carat.

University of British Columbia. "Canadian sapphires fit for a queen now unearthed." ScienceDaily. ScienceDaily, 27 July 2017. <www.sciencedaily.com/releases/2017/07/170727102856.htm>.

Field Trip Information

By Shirley Green

Hanson Rocky Mt. Quarry, Rocky Mount, NC

When:

Saturday, September 16th, 2017 from 8 am until we leave.

EVERYONE NEEDS TO ARRIVE BY 8:00 AM.

LATE COMERS WILL BE ASKED TO LEAVE!!!! (NO EXCEPTIONS)

Where:

The address is 10471 North Carolina 97 West, Rocky Mount, NC 27801. Be careful with this address sometimes your Garmin will take you the wrong way. You need to allow extra time so in case you get lost you'll have plenty of time.

Requirements:

- HARD HAT
- STEEL TOE BOOTS
- SAFETY VEST
- SAFETY GLASSES
- Everyone must comply with any and all safety requirements or directions as set forth by the owner and staff.
- We are guests of this site so please do not leave any litter behind.

Tools:

- Rock hammer
- Bucket or backpack
- Water
- Snacks
- Chisel maybe
- Small sledge hammer maybe
- Nail bag for small fossils
- Hand truck maybe
- Gloves
- Other fossil hunting tools that you desire

Collecting:

Hopefully we will be finding fossils here!

Information:

Children are allowed with parental supervision.

As always please follow all the Quarry rules as they're doing this to be nice. We want to make sure we are respectful of their rules. We don't want to cause them to get a fine because of something we did wrong.

Who:

Please send me an email if you plan to attend. Shirley Green. richard60green@yahoo.com (919) 848-1085

Supervolcanoes: A Key To America's Electric Future?

By Danielle Torrent Tucker

Researchers show that lake sediments preserved within ancient supervolcanoes can host large lithium-rich clay deposits. A domestic source of lithium would help meet the rising demand for this valuable metal, which is critical for modern technology.

Most of the lithium used to make the lithium-ion batteries that power modern electronics comes from Australia and Chile. But Stanford scientists say there are large deposits in sources right here in America: supervolcanoes.

In a study published today in Nature Communications, scientists detail a new method for locating lithium in supervolcanic lake deposits. The findings represent an important step toward diversifying the supply of this valuable silvery-white metal, since lithium is an energy-critical strategic resource, said study co-author Gail Mahood, a professor of geological sciences at Stanford's School of Earth, Energy & Environmental Sciences.

"We're going to have to use electric vehicles and large storage batteries to decrease our carbon footprint," Mahood said. "It's important to identify lithium resources in the U.S. so that our supply does not rely on single companies or countries in a way that makes us subject to economic or political manipulation."

Supervolcanoes can produce massive eruptions of hundreds to thousands of cubic kilometers of magma -- up to 10,000 times more than a typical eruption from a Hawaiian volcano. They also produce vast quantities of pumice and volcanic ash that are spread over wide areas. They appear as huge holes in the ground, known as calderas, rather than the cone-like shape typically associated with volcanoes because the enormous loss of magma causes the roof of the chamber to collapse following eruption.

The resulting hole often fills with water to form a lake -- Oregon's Crater Lake is a prime example. Over tens of thousands of years, rainfall and hot springs leach out lithium from the volcanic deposits. The lithium accumulates, along with sediments, in the caldera lake, where it becomes concentrated in a clay called hectorite.

Exploring supervolcanoes for lithium would diversify its global supply. Major lithium deposits are currently mined from brine deposits in high-altitude salt flats in Chile and pegmatite deposits in Australia. The supervolcanoes pose little risk of eruption because they are ancient.

"The caldera is the ideal depositional basin for all this lithium," said lead author Thomas Benson, a recent PhD graduate at Stanford Earth, who began working on the study in 2012.

Since its discovery in the 1800s, lithium has largely been used in psychiatric treatments and nuclear weapons. Beginning in the 2000s, lithium became the major component of lithium-ion batteries, which today provide portable power for everything from cellphones and laptops to electric cars. Volvo Cars recently announced its commitment to only produce new models of its vehicles as hybrids or battery-powered options beginning in 2019, a sign that demand for lithium-ion batteries will continue to increase.

"We've had a gold rush, so we know how, why and where gold occurs, but we never had a lithium rush," Benson said. "The demand for lithium has outpaced the scientific understanding of the resource, so it's essential for the fundamental science behind these resources to catch up."

Working backward - To identify which supervolcanoes offer the best sources of lithium, researchers measured the original concentration of lithium in the magma. Because lithium is a volatile element that easily shifts from solid to liquid to vapor, it is very difficult to measure directly and original concentrations are poorly known.

So, the researchers analyzed tiny bits of magma trapped in crystals during growth within the magma chamber. These "melt inclusions," completely encapsulated within the crystals, survive the supereruption and remain intact throughout the weathering process. As such, melt inclusions record the original concentrations of lithium and other elements in the magma. Researchers sliced through the host crystals to expose these preserved magma blebs, which are 10 to 100 microns in diameter, then analyzed them with the Sensitive High Resolution Ion Microprobe in the SHRIMP-RG Laboratory at Stanford Earth.

"Understanding how lithium is transported in magmas and what causes a volcanic center to become enriched in lithium has never really systematically been done before," Benson said.

The team analyzed samples from a range of tectonic settings, including the Kings Valley deposit in the McDermitt volcanic field located on the Nevada-Oregon border, which erupted 16.5 to 15.5 million years ago and is known to be rich in lithium. They compared results from this volcanic center with samples from the High Rock caldera complex in Nevada, Sierra la Primavera in Mexico, Pantelleria in the Strait of Sicily, Yellowstone in Wyoming and Hideaway Park in Colorado, and determined that lithium concentrations varied widely as a function of the tectonic setting of the supervolcano.

"If you have a lot of magma erupting, it doesn't have to have as much lithium in it to produce something that is worthy of economic interest as we previously thought," Mahood said. "You don't need extraordinarily high concentrations of lithium in the magma to form lithium deposits and reserves."

Improving identification - In addition to exploring for lithium, the researchers analyzed other trace elements to determine their correlations with lithium concentrations. As a result, they discovered a previously unknown correlation that will now enable geologists to identify candidate supervolcanoes for lithium deposits in a much easier way than measuring lithium directly in melt inclusions. The trace elements can be used as a proxy for original lithium concentration. For example, greater abundance of easily analyzed rubidium in the bulk deposits indicates more lithium, whereas high concentrations of zirconium indicate less lithium.

"We can essentially use the zirconium content to determine the lithium content within about 100 parts per million," Benson said. "Now that we have a way to easily find more of these lithium deposits, it shows that this fundamental geological work can help solve societal problems -- that's really exciting."

Stanford's School of Earth, Energy & Environmental Sciences. "Supervolcanoes: A key to America's electric future?." ScienceDaily. ScienceDaily, 16 August 2017. <www.sciencedaily.com/releases/2017/08/170816084929.htm>.

Dino-Killing Asteroid Could Have Thrust Earth Into Two Years Of Darkness

By National Center for Atmospheric Research/University Corporation for Atmospheric Research

Tremendous amounts of soot, lofted into the air from global wildfires following a massive asteroid strike 66 million years ago, would have plunged Earth into darkness for nearly two years, new research finds. This would have shut down photosynthesis, drastically cooled the planet, and contributed to the mass extinction that marked the end of the age of dinosaurs.

These new details about how the climate could have dramatically changed following the impact of a 10-kilometer-wide asteroid will be published Aug. 21 in the Proceedings of the National Academy of Sciences. The study, led by the National Center for Atmospheric Research (NCAR) with support from NASA and the University of Colorado Boulder, used a world-class computer model to paint a rich picture of how Earth's conditions might have looked at the end of the Cretaceous Period, information that paleobiologists may be able to use to better understand why some species died, especially in the oceans, while others survived.

Scientists estimate that more than three-quarters of all species on Earth, including all non-avian dinosaurs, disappeared at the boundary of the Cretaceous-Paleogene periods, an event known as the K-Pg extinction. Evidence shows that the extinction occurred at the same time that a large asteroid hit Earth in what is now the Yucatán Peninsula. The collision would have triggered earthquakes, tsunamis, and even volcanic eruptions.

Scientists also calculate that the force of the impact would have launched vaporized rock high above Earth's surface, where it would have condensed into small particles known as spherules. As the spherules fell back to Earth, they would have been heated by friction to temperatures high enough to spark global fires and broil Earth's surface. A thin layer of spherules can be found worldwide in the geologic record.

"The extinction of many of the large animals on land could have been caused by the immediate aftermath of the impact, but animals that lived in the oceans or those that could burrow underground or slip underwater temporarily could have survived," said NCAR scientist Charles Bardeen, who led the study. "Our study picks up the story after the initial effects -- after the earthquakes and the tsunamis and the broiling. We wanted to look at the long-term consequences of the amount of soot we think was created and what those consequences might have meant for the animals that were left."

Other study co-authors are Rolando Garcia and Andrew Conley, both NCAR scientists, and Owen "Brian" Toon, a researcher at the University of Colorado Boulder.

A world without photosynthesis

In past studies, researchers have estimated the amount of soot that might have been produced by global wildfires by measuring soot deposits still preserved in the geologic record. For the new study, Bardeen and his colleagues used the NCAR-based Community Earth System Model (CESM) to simulate the effect of the soot on global climate going forward. They used the most recent estimates of the amount of fine soot found in the layer of rock left after the impact (15,000 million tons), as well as larger and smaller amounts, to quantify the climate's sensitivity to more or less extensive fires.

In the simulations, soot heated by the Sun was lofted higher and higher into the atmosphere, eventually forming a global barrier that blocked the vast majority of sunlight from reaching Earth's surface. "At first it would have been about as dark as a moonlit night," Toon said.

While the skies would have gradually brightened, photosynthesis would have been impossible for more than a year and a half, according to the simulations. Because many of the plants on land would have already been incinerated in the fires, the darkness would likely have had its greatest impact on phytoplankton, which underpin the ocean food chain. The loss of these tiny organisms would have had a ripple effect through the ocean, eventually devastating many species of marine life.

The research team also found that photosynthesis would have been temporarily blocked even at much lower levels of soot. For example, in a simulation using only 5,000 million tons of soot -- about a third of the best estimate from measurements -- photosynthesis would still have been impossible for an entire year.

In the simulations, the loss of sunlight caused a steep decline in average temperatures at Earth's surface, with a drop of 50 degrees Fahrenheit (28 degrees Celsius) over land and 20 degrees Fahrenheit (11 degrees Celsius) over the oceans.

While Earth's surface cooled in the study scenarios, the atmosphere higher up in the stratosphere actually became much warmer as the soot absorbed light from the Sun. The warmer temperatures caused ozone destruction and allowed for large quantities of water vapor to be stored in the upper atmosphere. The water vapor then chemically reacted in the stratosphere to produce hydrogen compounds that led to further ozone destruction. The resulting ozone loss would have allowed damaging doses of ultraviolet light to reach Earth's surface after the soot cleared.

The large reservoir of water in the upper atmosphere formed in the simulations also caused the layer of sunlight-blocking soot to be removed abruptly after lingering for years, a finding that surprised the research team. As the soot began to settle out of the stratosphere, the air began to cool. This cooling, in turn, caused water vapor to condense into ice particles, which washed even more soot out of the atmosphere. As a result of this feedback loop -- cooling causing precipitation that caused more cooling -- the thinning soot layer disappeared in just a few months.

Challenging the model

While the scientists think the new study gives a robust picture of how large injections of soot into the atmosphere can affect the climate, they also caution that the study has limitations.

For example, the simulations were run in a model of modern-day Earth, not a model representing what Earth looked like during the Cretaceous Period, when the continents were in slightly different locations. The atmosphere 66 million years ago also contained somewhat different concentrations of gases, including higher levels of carbon dioxide.

Additionally, the simulations did not try to account for volcanic eruptions or sulfur released from the Earth's crust at the site of the asteroid impact, which would have resulted in an increase in light-reflecting sulfate aerosols in the atmosphere.

The study also challenged the limits of the computer model's atmospheric component, known as the Whole Atmosphere Community Climate Model (WACCM).

"An asteroid collision is a very large perturbation -- not something you would normally see when modeling future climate scenarios," Bardeen said. "So the model was not designed to handle this and, as we went along, we had to adjust the model so it could handle some of the event's impacts, such as warming of the stratosphere by over 200 degrees Celsius."

These improvements to WACCM could be useful for other types of studies, including modeling a "nuclear winter" scenario. Like global wildfires millions of years ago, the explosion of nuclear weapons could also inject large amounts of soot into the atmosphere, which could lead to a temporary global cooling.

"The amount of soot created by nuclear warfare would be much less than we saw during the K-Pg extinction," Bardeen said. "But the soot would still alter the climate in similar ways, cooling the surface and heating the upper atmosphere, with potentially devastating effects."

National Center for Atmospheric Research/University Corporation for Atmospheric Research. "Dino-killing asteroid could have thrust Earth into two years of darkness: Light-absorbing soot in the atmosphere had the potential to block photosynthesis." ScienceDaily. ScienceDaily, 21 August 2017. <www.sciencedaily.com/releases/2017/08/170821151056.htm>.

UPCOMING SHOWS

April 6 - 8, 2018: Raleigh, NC – 42nd Annual Capital Area Gem & Mineral Show. Tar Heel Gem and Mineral Club, Inc. Kerr Scott Building, NC State Fairgourds, Raleigh, NC. The show is sponsored by the Tar Heel Gem & Mineral Club and includes 29 dealers. The Hospitality area sells grab bags with mineral specimens. Buy a rock at the Geode booth and be the first to see what is inside. The on-going Silent Auction has new items every hour. Dealers provide minerals, fossils, finished jewelry, gemstones, findings and beads for sale.. Hours: Fri 3-8; Sat 10-6; Sun 10-5. Admission: Free and Free Parking. Contact: Cyndy Hummel; 919-779-6220; mchummel@mindspring.com; www.tarheelclub.org;

October 6, 7 and 8, 2017 (Fri. Sat. Sun.): Dallas, NC - Gaston Gem, Mineral & Faceters' Show. Presented by the Gaston Gem, Mineral & Faceters Club of Gaston County, NC. Hours: Friday & Saturday: 9 AM TO 6 PM; Sunday 9 AM TO 5:00 PM; Address: Gaston County Park, 1303 Leisure Lane (Hwy 279 [Dallas-Cherryville Hwy]), Dallas, NC. FREE ADMISSION. Jewelry, wire wrapping, faceting and rough materials. Minerals from around the world! Hourly raffles and a grand prize awarded Sunday at 5:00PM. Grab bags and gem buckets for sluicing. Contact: Dealers Interested In Participating, Please Contact David Long, Show Chairman Phone 704-860-1025. E-Mail david28054@att.net

November 17 - 19, 2017: Columbia, SC - The Columbia Gem & Mineral Society will hold its 50th Annual Gem, Mineral, & Jewelry Show. Hours: Fri. Nov. 17, 10:00 - 6:00; Sat. Nov. 18, 10:00 - 6:00; Sun. Nov. 19, 11:00 - 5:00; Address: Jamil Temple, 206 Jamil Rd., Columbia, SC 29210. Admission: $5.00 for adults, Sixteen & under free with adult. All military & their dependents free. Jewelry, beads, loose stones, fossils, minerals, gold, silver, & tools for sale. Geodes sold & cut. Club member's rock collections on exhibit & lapidary demonstrations. Lots of fun for the whole family. South Carolina amethyst on display. Sponsored by The Columbia Gem & Mineral Society. Contact: Sue Shrader 803-736-9317; ashrader@mindspring.com; Dealers; Sharon Sterrett 803-356-1472; ssterrett@sc.rr.com; www.cgams.org

Vugsites

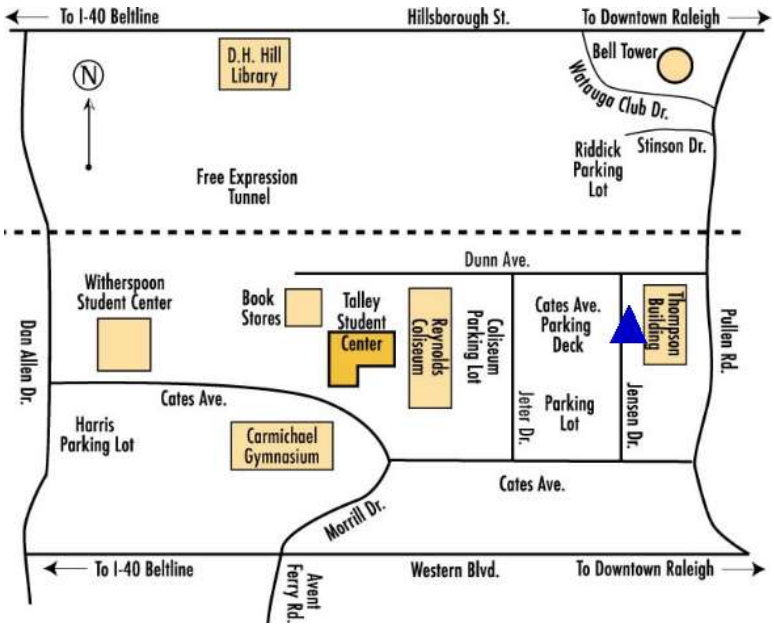
The following are some links to Web-Sites that may interest some of our members:

http://www.tarheelclub.org / https://www.facebook.com/tarheelgemandmineralclub/ These are the official sites for the Tar Heel Gem & Mineral Club. I would strongly urge all members to check them out on a regular basis.
http://www.amfed.org / http://www.amfed.org/sfms These are the official sites for the organizing body that the Tar Heel Gem & Mineral Club is founded under. I would strongly urge all members to check them out on a regular basis.
http://www.amfed.org/sfms/lodestar_newsletter.html The SFMS Lodestar Newsletter
http://www.carolinageologicalsociety.org/CGS/Home.htmlThis site provides numerous downloadable field-trip guide books, maps, and charts of the Carolinas. It will prove to keep any avid rock hound busy for years. Great Site!
http://www.ncminerals.com/ncmineralswebsite_files/page0011.htm And while we are on the subject, try this link. Its titled: Links of Interest to Rock hounds in NC. It will take you to a list of links for North Carolina gems and minerals.
http://www.rocksforkids.com/ Just like the name says, a nice place to steer the younger members.
Information & photographs of over 6300 specimens from the Glenn & Martha Vargas Gem & Mineral Collection.
http://www.rockhoundlounge.com Scott Laborde, a club member maintains his own web site that might be of interest to people collecting in and around Wake County.
http://www.msnbc.msn.com/id/29726500/ns/technology_and_science-science This site highlights a half dozen of the most recent significant fossil finds.
http://appmodo.com/13971/mole-quest-for-the-terracore-gem-app-review-for-the-iphone-and-ipod-touch/ If you have an iphone or an ipod touch, this rock-hounding may be the game for you.
http://diamonddanpublications.net/index_files/page0009.html Diamond Dan's Mini Miner's Monthly

I would like to encourage all members of the THG&MC that maintain their own presence on the internet to send me a link to their site to be published in future Vugsites so that other club members may learn and enjoy the craft, the art, the interests that many of us have in common.

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

Our Next Meeting is September 19, 2017 @ 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
10609 Chelsea Drive
Raleigh, NC 27603