

Tar Heel Tailings

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

Special Interest Articles:

- President's Report
- Meteorite chunk – 300 Pounds, Five Billion years old
- Field Trip Update

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President's Report

Hello everyone,
It's hard to believe that another month has gone by. After seeing all of the pictures, it looks as if everyone had a great time on the last field trip. I haven't heard what was found but I hope it was a productive day. I wish I could have gone. I would like to thank Cyndy for setting up our last program.

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Meteorite chunk about 300 pounds, 5 billion years old

by Doug Aamoht

Here's a large, dense chunk of the meteor that hit near present-day Flagstaff, Arizona roughly 50,000 years ago. It's on display at The Franklin Institute in Philadelphia and, according to Chief Astronomer Derrick Pitts, is older than Earth itself. It's not a gadget, sure, but in the hopes that some of our readers' interests cross over into the space and astronomy field, here's a quick science post. The sample is apparently five billion years old and weighs

300 pounds. Earth itself is approximately 4.6 billion years old, meaning that the meteorite that crashed into present-day Arizona came from a long time ago and (perhaps) a galaxy far, far away. The land near

Flagstaff, AZ that's home to "Meteor Crater" is also known as "Barringer Crater," formerly "Canyon Diablo Crater." Daniel Barringer's Standard Iron Company purchased the land in 1903 and members of

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

Program & Refreshments

REFRESHMENT SCHEDULE:

Coordinator: Jeanette Baugh
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Oct: Corinne & Cyndy Hummel
Nov: OPEN

PROGRAM SCHEDULE:

Oct: Mike Franklin - A Tale of Two Meteorites
Nov: Election and Grab Bags

Field Trip Pictres



October B-Day Members

- Laurie Adams
- Brenda Arriens
- Elizabeth Blatt
- Clarice Perry
- Denise Chrisey
- John Everette
- Claudine Gates
- Larry Jackson
- Laura Jenkins
- Joann Lail
- Joe & Patti Moylan
- Barrett Redpath
- Elaire Schulz
- John Sieminski
- Robin Suddaby



Membership applications may be mailed to:

Tarheel Gem & Mineral Club
Attention: Treasurer
10609 Chelsea Drive
Raleigh, NC 27603

Sunshine Report

Club member Keith Leese was in a really bad car accident on September 9 and is in critical condition in the trauma center at UNC Hospital. Room 2703. Contact Sean Sweeney for information at 493-6198. Respectfully Submitted, Joe Moylan

Tar Heel G & M Club September Meeting Minutes

Tuesday, September 21, 2010

Walt called the meeting to order at 7:42pm

Walt provided the munchies of food and beverage. Thank you Walt!

The Door Prize winner was Auston Jenkins! He chose a Petrified wood that looked somewhat like a small branch. Congratulations!

Jeff & Auston are new attendees.

Auston was collecting since age 7.

One man who does wood turning brought a marsupial with him. Also brought two pages on doing gem inlays in items.

Birthdays in September

Mike was showing how he made a walking stick with a magnet to locate meteorites in the field.

George Harris mentioned about his liking of cabbing minerals and being the club newsletter editor.

Walt had the rock joke.

Walt asked about the minutes and if any corrections needed to be made. He also asked about approving the minutes as posted which was made, seconded and carried.

About the treasures report, there was nothing to be noted.

Walt talked about the By-Laws committee and days available for that. Jeannette Baugh went over the discussion about items for the display case.

Tom Tadaro went over fieldtrip to Stone Quarry on Sept. 25th at 9am. He also asked about e-mail addresses for notifications.

Also talked about Glendon trip and being a membership with MAGMA among one other site.

As there is a filled trip in October to look for Pyrite and possibly Flourite.

Walt also mentioned about the Odessa meteorite and the October meeting. Walt concluded the business meeting for munchies and then the Speaker for the meeting.

Cyndy Hummel introduced Jeff Schlottman of Crystal Perfection. He spoke about Tourmaline, it's properties and characteristics. And the history of the mineral too. Not to make a bad Pun out of it but, it was quite fascinating.

Happy Rock Hounding
Obsidian Harris

October's Program

Mike Franklin, A Tale of Two Meteorites

Abstract: October's presentation will be a 30-minute lecture/discussion by Mike Franklin on iron meteorites from Odessa, Texas and Canyon Diablo, Arizona. The question is: Are they part of the same fall? Questions such as: where do meteorites come from, what are they made of, how dangerous are they, where and how do you find and identify them will be addressed. He will

include a little astronomy, physics, chemistry, and geology.

As a double treat during the refreshment time, a 40-minute episode (commercials removed) of the Meteorite Men will be presented. For a finale, a stony-iron meteorite found recently by Steve Arnold (one of the Science Channel Meteorite Men) in Kansas that has olivine-peridotite inclusions will be

viewed. For bonus coverage--after the TV showing, we can discuss how to build a better meteorite hunter magnetic stick!

If you want to learn what Mike has done in the past, see his web page at mikefranklinconsulting.com

Come Early to see the Club's Items on display in the Craft Center's Windows.

Pictures from September's Program



Meteorite chunk about 300 pounds, 5 billion years old

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Barringer's family, who are on the board at The Franklin Institute, donated this gargantuan sample to the museum.

It's made of a nickel-iron mixture and feels a bit slick to the touch. I asked

Pitts if it'd been coated in anything to preserve it and he told me that it's not been protected in any way. It felt similar to a big bronze statue like you'd find in a city park.

There was also a smaller piece of

moon rock inside a glass display that was about 3 billion years old but Pitts thinks the meteorite chunk is cooler because it gives people a chance to "touch the oldest rock they'll probably ever touch."

President's Report

Continued from page 1

In case you weren't there, Jeff Schlottman, from Crystal Perfection came by and spoke to the group about Tourmaline. It was a great presentation and I know I learned a lot about them. I hope we can have him back some time in the future to speak on another topic.

Speaking of programs, I am really looking forward to this month's program by Mike Franklin on meteorites which is an interest of mine. If you have any meteorites to show the rest of the club, please bring them in.

We are going to try something new this next meeting. At the suggestion of one of our members, we will try and have our presentation first, followed by the business meeting. This will give our younger members a better opportunity to come to the meetings and learn about Geology but still leave early enough to get some sleep for school.

Elections are coming up in November. Please be thinking about how you might be able to help the club. We are always looking for new people to step up and bring in fresh ideas. No prior experience necessary. If you know the

difference between a quartz crystal and a bag of dirt you're qualified! Deanna Gould is coming to sell some material she has from New Zealand. She is moving and can't take it all with her. She will be set up outside in the lobby area before and during the meeting for anyone who might like to purchase something.

I know school is back in session but I'm looking forward to seeing as many people as possible next Tuesday.

Walt Milowic

Canyon Diablo Meteorite

Basic Information

Location: Coconino County, Arizona, about 40 miles east of Flagstaff, Arizona. Latitude 35 degrees 3 minutes North, Longitude 111 degrees 2 minutes West.

Structural Class: Coarse octahedrite, Og, Widmanstätten bandwidth 2.0 ±0.5mm.

Chemical Class: Group I, 7.1% Ni, 0.46% Co, 0.26% P, about 1% C, about 1% S, 80 ppm Ga, 320 ppm Ge, 1.9 ppm Ir.

Time of Fall: Between 20,000 and 40,000 years ago.

History

The Canyon Diablo crater, and quite likely its iron meteorites, were known to the Indians before the white man came to Arizona. While it has been reported that the area was considered cursed, the fall was almost certainly prior to Indian habitation. There is no reason to believe that the Indians knew of the extraterrestrial origin of the crater.

The first specimen was brought to the attention of scientists in the mid 1800s. Meteorite dealers began to trade in Canyon Diablo samples in the 1890s. Large quantities of specimens were reportedly shipped to location throughout the world during those early years.

While the meteorites were gaining recognition, the origin of the crater remained in doubt. G.K Gilbert, an eminent geologist of the time and the first to suggest meteoritic origin of lunar craters, concluded that the Canyon Diablo crater was the result of a steam explosion. This theory was a long time dying and was accepted by some as late as 1953.

Commercial interests were not so doubtful. In 1903, lawyer-mining engineer-geologist Daniel Barringer recognized the crater as a potential site for mining of iron and nickel. Barringer staked mining claims on the site and began a search for a huge iron mass.

Over the next twenty years Barringer spent more than \$600,000 drilling dozens of drill holes in the crater floor looking for the large mass. When he did not find it there, he hypothesized that it might be buried under the south rim. A final hole did strike increasing metal before it had to be abandoned because of bad drilling conditions. Some claimed that the long sought mass had been discovered.

Even before Barringer began his final holes a controversy began on whether any large mass would ever be found. In 1908, George Merrill suggested that the meteorite may have vaporized on impact.

Barringer died in 1929 and the high cost and ambiguous results of Barringer's efforts led investors in his company to seek reexamination of the premise of a large buried mass. The company retained a well respected astronomer and ballistics expert, F.R. Moulton, to make calculations about the mass of iron that could be expected. Moulton's

startling conclusion was that the high energy of the impact would vaporize and fragment the entire mass--there would be no large iron-nickel mass.

Eventually, students of the matter reached a consensus that indeed the mass had been mostly vaporized on impact. Drilling and geophysical studies supported this conclusion. In addition, Nininger found a large area of tiny spherical iron droplets north east of the crater.

Today the Crater is operated as a private tourist attraction by the Meteor Crater Enterprise. The crater itself still belongs to the Barringer family.

The Impact and the Crater

The Meteor Crater is a huge hole--about three quarters of a mile wide and 600 feet deep. So, what kind of a meteorite could have made this hole? How heavy was it? How fast was it traveling? These questions have been the subject of scientific speculation since the crater was first recognized being the result of an impact.

From 1910 to the 1950s different scientists estimated a mass varying between 5,000 and 5,000,000 tons. In 1963, a scientist compared the crater to those made by nuclear tests. He calculated that an energy of 1.7 megatons (1.7 million tons of TNT) would be required to produce the crater. This energy would be delivered by a mass of 63,000 tons (a sphere about 80 feet in diameter) traveling at 9 miles per second.

The resulting crater is 3400 feet across, is about 600 feet from rim to floor, and has a rim that rises 200 feet above the plain. From the air, the crater has a squarish shape. The speculation is that this results from the character of the preexisting rock formations. (Crater photo courtesy Calvin Hamilton.).

Where Did the Meteorite Go?

If a 63,000 ton meteorite hit the earth in Arizona, where is it now? As was noted above, Moulton calculated that most of the mass would have been vaporized on

impact. Harvey Nininger, a famous meteorite hunter and well-respected student of meteorites, hypothesized that he would find evidence of iron condensed after vaporization. He studied the area around the crater and mapped a large area to the northeast of the crater were tiny spherical droplets of condensed iron can be found. This is apparently where most of the mass is located.

The idea that the huge Canyon Diablo mass was blasted into small bits is supported by the lack of large specimens. The largest Canyon Diablo recovered is the 639 Kg on display in the Meteor Crater Museum. Specimens over ten kilograms are rare and those over 100 Kg are only a handful. The adjoining map gives a rough idea of the distribution of the small specimens around the crater.

Nininger estimated that about 30 tons of specimens had been collected. Other workers have estimated that 8,000 tons of iron are contained in the fine grained material around the crater. This leaves about 55,000 tons to speculate about. Some of it remains buried as Barringer's drilling showed. The largest part of it may have been vaporized and drifted far away. Some of it remains in the form of specimens in area surrounding the crater. Until the area was closed to meteorite hunting recently, hunters with metal detectors were still finding significant numbers of specimens.

Minerals of the Odessa Meteorite

The mineralogy of Canyon Diablo meteorites depends on whether they have been shocked by impact. While all of the specimens were shocked to some degree, some specimens found around the crater rim show very different mineralogy.

The less altered mineralogy is typical of iron meteorites. The important minerals are:

Kamacite: this iron nickel alloy makes about 90 percent of specimens.

Taenite: the other iron nickel constituents taenite and plessite make up 1 to 4 percent of the material.

Schreibersite crystals: occur as skeletal blades. This is a very hard mineral that will ruin a saw blade unfortunate enough to be put to the task of cutting a Canyon Diablo.

Troilite: this iron sulfide occurs as nodules up to 50 mm across or as elongated lenses. Troilite may be mixed with graphite, daubreelite, chromite, or base metal sulfides. Troilite-graphite masses may make up about 8.5 % of specimens.

Graphite: occurs as large bodies within iron or in separate masses.

Cohenite: an iron carbide, is common. This mineral is even harder than Schreibersite.

Haxonite, chromite and silicates are also found.

The specimens that were subjected to greater shock show partial melting, recrystallization, neumann banding and other deformation. Perhaps the most well-known shock effect is the transformation of graphite to diamond and lonsdaleite. These take the form of tiny dark masses that become evident on sawing. A diamond blade will move aside when it hits one of these.

Further Reading

Rocks from Space by O. Richard Norton, Mountain Press, 1994. Norton devotes a chapter to the Canyon Diablo. Both the text and pictures are excellent.

Handbook of Iron Meteorites by Vagn Buchwald, U. of California Press, 1976. This reference is very complete technical description of known iron meteorites. Buchwald takes more of a metallurgists approach to the subject.

Guidebook to the Geology of Barringer Meteorite Crater, Arizona (a.k.a. Meteor Crater)

by David A. Kring ©2007, Lunar and Planetary Institute

LPI Contribution No. 1355. This is a complete book free online.



November's Program

Grab Bags will be the Program for November. Bring all of your items that you want to contribute to the Grab bags for the show. If there are any items left

over, they can be stored in the club's storage unit. Also, during the business meeting, we will be having Elections. So if you want

to run for a position as one of the Club's officers, or want to decline any positions nominated for, make sure to be at the November meeting.

UPCOMING SHOWS

October 15-17, 2010: Knoxville, TN - Knoxville Gem and Mineral Society. 19th Annual Gem, Mineral, and Jewelry Show, Kerbela Temple, Mimosa Ave. Show is \$4/per day per adult.

November 6-7, 2010: Melbourne, FL - Canaveral Mineral & Gem Society. Parade of Gems, Melbourne Auditorium, 625 E. Hibiscus Ave. Hours: Fri & Sat 10-5. Contact Don McLamb 321-723-2592 or fdjmc@aol.com

Nov 12-14, 2010: Pascagoula, MS - Mississippi Gulf Coast Gem & Mineral Society. 20th Annual Magnolia State Gem, Mineral and Jewelry Show, Civic Center Building, Jackson County Fairgrounds. Hours: 12th & 13th 10-6; 14th 10-5. Free admission. Contact John Wright (228) 875-9192 or osjwb@datasync.com

Nov 20-21, 2010: West Palm Beach, FL. 44th Annual Gem, Mineral, Jewelry, Bead, and Fossil Show, Americraft Expo Center East, 9067 Southern Blvd. Hours: Sat 9-6, Sun 10-5. Over 60

dealers, door prizes, fossil dig. Free parking. Adults \$7, children under 12 free. Contact Barbara Ringhiser at bar5678@aol.com.

Nov 26-28, 2010: Mobile, AL. Annual Gem, Jewelry, Mineral, and Fossil Show. Greater Gulf State Fairgrounds, Cody Road and Zeigler Blvd. Hours: Fri 2-7, Sat 9-6, and Sun 10-5. Contact Show Chair Jerry Shirey at (251) 458-2867 or e-mail rockhoundjs@aol.com.

Nov 26-28, 2010: Salem, VA - Roanoke Valley Mineral and Gem Society. 31th Annual Gem, Jewelry, & Mineral Show and Sale, Salem Civic Center, 1001 Roanoke Boulevard. Hours: Fri 2-7, Sat 10-6, and Sun 12-5. Admission \$3 (all 3 days), under 16 free. Contact Jeff McFalls at e-mail rocky@rvmgms.com or www.rvmgms.com

Jan 14-16, 2011: Largo, FL - The Pinellas Geological Society. 35th Annual Gem, Jewelry and Mineral Show and Sale, Largo Cultural Center, 105 Central Park Drive. Hours: Fri & Sat 10-6, Sun 12-5. Free admission. Contact Hugh Sheffield (727) 894-2440.

Pictures from Glendon



Bob Bendolow with plate of Pyrite



Check-In with Lee



Pyrite in darker matrix



Plate of Pyrite in Pyropholite



Flourite in Quartz



People working for their pyrite.

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

<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.html> This 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.

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.

