

# GEM & MINERAL JOURNAL

Official Monthly  
Publication of the Gem &  
Mineral Society of  
Lynchburg, VA, Inc  
[www.lynchburgrockclub.org](http://www.lynchburgrockclub.org)

JUNE 2016

VOLUME 25~ ISSUE 6

## President's Message:

Hello To All,

Not much to talk about at the moment. At this time we are getting ready for the Uncle Billy's Day Festival, and hoping that everyone that signed up to help will show up to help. This is as you know a Club fund raising function and the more members that participate makes it easier on all involved. I have a lot more to say about Festivals, but not right now.

Nona & I went to the Treasures of the Earth Gem & Mineral show at the Salem Civic Center May the 29<sup>th</sup>. It was again a great show with lots to see and drool over. We did purchase a new specimen of Crystal Mica from the North American Emerald Mine at Hiddenite, NC. The Chromium that creates the Emeralds has combined with the Mica to create beautiful hex shaped crystals that are

close to looking like smokey quartz and also includes some Vanadinite Crystals on the reverse side with a hint of green which looks like imbedded Emeralds. Believe me they are not too large. It is the first time I have seen this type of formation. There should be some more specimens for sale at the November Show.

It seems we are in for a treat of a program for the June 15<sup>th</sup> meeting . If you like crystals and jewels you will love this presentation. That's all for now, I hope to see you at the meeting.

Keep Looking Down,  
John Haskins

## From the First V.P.

Hooray for Dave Woolley who was able to get Biff Bowen of Bowen's Jewelry to speak at our next meeting. His presentation is entitled "Current Trends in the Polished Gemstone Market". His talk will include the top 10 faceted colored gemstones, where they're mined, whose purchasing them in the world market, and what we can expect to see in the local stores. Should be a great experience for all of us.

To help our members understand faceting in preparation for our meeting, check out the following information from Wikipedia.



### Facet

For uses in mathematics, see [Facet \(geometry\)](#). For other uses, see [Facet \(disambiguation\)](#).

*Below left: A cut [ruby](#), with facets visible.*

**Facets** are flat faces on geometric shapes. The organization of naturally occurring facets was key to early developments in [crystallography](#), since they reflect the underlying symmetry of the [crystal](#) structure. [Gemstones](#) commonly have facets cut into them in order to improve their appearance by allowing them to reflect light.

Of the hundreds of facet arrangements that have been used, the most famous is probably the round [brilliant cut](#), used for [diamond](#) and many colored gemstones. This first early version of what would become the modern Brilliant Cut is said to have been devised by an Italian named Peruzzi, sometime in the late 17th century.<sup>[1]</sup> <sup>[2]</sup> Later on, the first angles for an "ideal" cut diamond were calculated by [Marcel Tolkowsky](#) in 1919.

*Continued on page 14*



## May Meeting Minutes

**Meeting:** Wednesday, May 18, 7:00 PM

**Attendance:** 39 members

**Host:** Dave and Noel Woolley and were host for tonight's meeting. Linda and Thom Noble will host the June meeting.

**On Time Drawing Winners:** Nona Haskins, Debbie Baroch, Mrs Blackford, Terry Wilson, Don McIntyre, Bob McIntire, Jack Curtin, Brenda Finch, and Ed Blackford.

**50/50 drawing winner:** Dave Callahan.

**President - John Haskins-NewBusiness:** Uncle Billy's Day Signup sheet available for those wishing to volunteer to help at the festival in Altavista on June 4<sup>th</sup>. Please contact John Haskins or Dave Callahan for further information.

**First VP:** Jack Curtin-Informed group that Scott Duresky will speak at February 2017 club meeting about The Historic Rutherford Mine, Pegmatite #2 of Amelia Courthouse, Virginia.

Micro Minerals samples from the Rutherford Mine will be available. Those interested send Jack your email address.

**Second V.P. - Dave Callahan:** Upcoming field trips: 5/28- Radford and VT Museums. 5/27-29- Treasures of the Earth Gem and Jewelry Show

at the Salem Civic Center; June: Pending field trip to Piney River Quarry.

**Treasurer:** Frank Midkiff- the current balance of \$5,891.08

Dave Woolley recommended everyone to check out Excalibur Minerals in Charlottesville. Also is a good source of information on materials.

**Program-** Ed Blackford talked about his experiences during his time in Ethiopia. He had samples of the opals he acquired on his trip.

Warren Darling provided items for the silent auction.

**Minutes submitted by Linda Noble, Secretary**



### 2016 ELECTED OFFICERS

**PRESIDENT - John Haskins**  
(434) 525-8430  
[JMHaskins1@netzero.net](mailto:JMHaskins1@netzero.net)

**First Vice President**  
**Jack Curtin**  
(434) 384 -6249  
[jacwcurtin@gmail.com](mailto:jacwcurtin@gmail.com)

**Second Vice President**  
**David Callahan**  
(540) 297-1853  
[DBCALL1@aol.com](mailto:DBCALL1@aol.com)

**Secretary**  
**Linda Noble**  
(434) 332-4869  
[linda-noble@hughes.net](mailto:linda-noble@hughes.net)

**Editor - Natalie Darling**  
(434) 941-1899  
[gmsleditor@gmail.com](mailto:gmsleditor@gmail.com)

**Treasurer - Frank Midkiff**  
(434) 660-1565  
[midkiffsm1@gmail.com](mailto:midkiffsm1@gmail.com)

**Members At Large-**  
Bernardino Rivera &  
Eric Routon

### COMMITTEE CHAIR PERSONS:

**Field Trips-** David Callahan  
**Hospitality-** Monthly Volunteers  
**News Articles-** Natalie Darling  
**Silent Auction-** Warren Darling  
**Swap for Rocks-** Warren Darling  
**Website-** Casper Voogt  
**Workshops-** Dave Callahan  
**FRA Adult Liaison-** OPEN  
**Membership-** Thom Noble

# PROGRAMS

Ed Blackford presented the program for our May meeting, speaking on his recent collecting experiences exploring in Ethiopia.

For our June 15, 2016 meeting, the program will be on Faceting, with guest speaker Biff Bowen. Please come out and help us extend a warm GMSL welcome to Mr. Bowen and learn about the latest trends in faceted stones.

## Bench Tips By Brad Smith

“Bench Tips for Jewelry Making” and “Broom Casting for Creative Jewelry” are available on Amazon

### QUICK CLOSE-UPS

Often when trying to get a close-up photo with your iPhone or Android, you end up with a fuzzy, out-of-focus image. Next time try using your loupe over the camera lens. It works quickly and easily.



One friend had a polishing bur bend in the handpiece and then whack the thumb that was holding the workpiece so badly that it seemed the bone might be broken. The swelling was substantial, and it took several weeks to regain normal use. A small underpowered motor? I don't think so.

Another friend was using one of the small buffing machines, the kind you can stop when you apply too much pressure to the wheel. Not to worry about such an underpowered beast you say. Wrong, it literally jumped up and bit the hand that feeds it !

### LITTLE THINGS CAN BITE

Most jewelers treat motorized equipment with caution. We've all heard stories about workpieces coming loose in the drill press or about getting long hair or clothing caught in the polishing machine. It stands to reason that a machine with a motor of a half horsepower or so is going to win out over its operator. We all know that, and I'm not going to harp on it. That's not the point of this story.

I want to talk about the smaller motor powered machines we often use, the ones with little 3 inch diameter motors. For instance, these small motors are used in flexshafts and micro buffers. They're so small that many of us forget caution when using them. I'm guilty of it myself sometimes, and believe me it can get you in trouble. Here's what happened to two people I know.

Buffer was set on a low table to do a quick polish, so was not mounted or clamped. A buff was installed on the right spindle, no buff on the left. Friend was wearing a tight-fitting, long-sleeved sweater. While buffing on the right wheel, the left tapered spindle caught a thread on the friend's left sleeve and started grabbing more and more threads and sleeve.

Rather than pulling the arm into the machine, the light buffer quickly lifted off the table and started climbing up the underside of the friend's arm. There was no way to get a hand of the on/off switch because the unit was spinning wildly and battering my friend like a club wielded by a mad man. Only when my friend could grab the gyrating power cord and yank it from the wall did the mayhem stop.

FIELD TRIP REPORT...



Past Field Trip

Past field Trip to the Radford University and Virginia Tech mineral museums.

May 28, 2016

This field trip was a little different this month. We had an opportunity to get an advanced tour of the mineral and fossil museum located in the new Center for the Sciences building. Steve Lenhart and his crew have been working diligently to prepare for the grand opening set for October 15th 2016. We were able to see some of the exhibits and had a tour of the facility. It will be a wonderful museum when complete with many displays of rocks, mineral and fossils. The fluorescent mineral display will be extremely nice, well presented and beautifully lit. Many of the rocks and minerals on display there will be donations from members of the Lynchburg and Roanoke Gem and Mineral clubs. There will be many interesting and educational items to see there and I urge all our members and friends to attend the Grand opening.

We departed about noon for the thirty minute drive to Blacksburg and the Mineral Museum at the Virginia Tech. campus in Deering Hall. Museum Director, Llyn Sharp had the facilities open for us at 1PM. This is also a very interesting rock, mineral and fossil museum. There were many interactive teaching exhibits and they were all prepared by the students.

Tech is also having their annual Geo Fair on Saturday October 15, 2015 so you will be able to visit both facilities on the same day. Unfortunately, that is the same day the Lynchburg Club is scheduled to have our annual Fall Apple Festival fund raising event in

Contact Information  
for Field Trips  
David Callahan,  
Field Trip Chairman  
Home phone: 540-297-1853  
Cell Phone- 540-874-5201  
E-mail [dbc11@aol.com](mailto:dbc11@aol.com)



Amherst.

We had a great turnout for this event with thirty one members attending. I think everyone had a good time and enjoyed the museums and fellowship. We are fortunate to have so many Colleges and Universities nearby that open their facilities to the general public and have such wonderful exhibits.

*Photos submitted by Linda Noble*



## Up Coming Field Trips



For additional information or to sign up for field trips, please contact Dave Callahan, Field Trip Chairman

**Home phone: 540-297-1853**

**Cell Phone- 540-874-5201**

**E-mail dbcall1@aol.com**

### June Field Trip Lynchburg and Roanoke Mineral and Gem Clubs

8:15 to 8:30 AM EDT (assembly at the quarry for mandatory sign-in and hazard training)

**9:00 AM EDT to 12:00 NOON (collecting hours)**

**Saturday, June 25, 2016**

**Boxley Aggregates, Piney River Quarry (Amherst County)**

**739 Warrick Barn Road, Arrington, VA.**

**Sign-up is required**--call me--email me or sign up at the meeting

**NEW SAFETY REGULATIONS NOW APPLY.....READ CAREFULLY AND COMPLY**

**COLLECTING:** According to the [mindat.org](http://mindat.org) Web-site, the following minerals are listed from Minerals of Virginia, 1990 edition. Some on this list have not been found on our past field trips. (An ( \* ) indicates those known finds on past field trips)

**Anatase:** A greenish-brown replacement of ilmenite.

**Ilmenite:** Black metallic or highly weathered masses. ( \* )

**Kaolinite:** White powdery masses from the alteration of feldspar. ( \* )

**Quartz:** Light blue to white ( \* )

**Rutile:** Reddish-brown metallic to highly weathered masses. ( \* )

**Tacharanite:** White, dull to pearly. Occurs with the weathered anatase, rutile and ilmenite.

**Zoisite var: Thulite:** Veins of pink thulite occur in the feldspar. ( \* )

Some additional minerals we have also found there:

**Pyrrhotite:** (has been verified) ( \* ) Silvery metallic when fresh but weathers to a dark rusty color when exposed to the weather. **Pyrite:** Small crystals and masses ( \* )

**Garnets:** Small crystals and masses ( \* )

**Muscovite and Biotite:** Small crystals and masses ( \* )

**Chlorite:** Masses ( \* ).

The main rock mined here is called **APLITE**. It is **very hard**, light-colored, and fine-grained and consists primarily of sodic plagioclase feldspar and quartz in the groundmass and, in some cases, orthoclase feldspar phenocrysts. Like pegmatites, aplite dikes may represent a residual fraction on silica-rich magma after most on the magma has crystallized.

Remember that the availability of these minerals depends on where they are working in the quarry at the time of the field trip and how many stock piles are available. Note that some of the occurrences are very small.

**DIRECTIONS:** From Lynchburg, VA., follow US 29 Bypass north to Amherst. Continue on the US 29 by-pass for about 2 miles until you come to Rt.151 (Patrick Henry Highway). Turn Left on Rt. 151 and continue for about 6 miles and turn left on RT. 665 (Warrick Barn Road). The entrance road to the quarry will be in about 1 mile on the right.

**MEETING LOCATION & ASSEMBLY TIME:** **8:15 to 8:30 AM.** At the quarry scale house / office. You will need sufficient time to review the Boxley Release and Waiver of Liability along with the Hazard Training information, fill out and sign both the Hazard Training Certificate and sign the required Boxley Waiver of Liability form. There will also be a review of the site specific hazard training and safety regulations by the quarry Superintendent. Everyone must be present for this presentation. If you are late, you will not be permitted to enter the quarry. We all will enter the quarry as a group about 9:00 AM.

**All safety rules will be strictly enforced or you will be escorted out of the quarry and barred from future field trips.** Our members adhering to the basic safety rules in the past is the only reason Boxley continues allowing us access to their quarry today. Any member not complying with the basic safety rules, will be promptly escorted from the quarry and barred from all future field trips.

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## Dagger in Tutankhamun's tomb was made with iron from a meteorite

Researchers who analyzed metal composition of dagger within wrapping of mummified teenage king say it "strongly suggests an extraterrestrial origin"

Submitted by Warren Darling,

reprinted from <http://www.theguardian.com/world/2016/jun/01/dagger-king-tut-tomb-iron-meteorite-egypt-mummy>

[Alan Yuhas, Thursday June 2, 2016]

A dagger entombed with King Tutankhamen was made with iron from a meteorite, a new analysis on the metal composition shows.

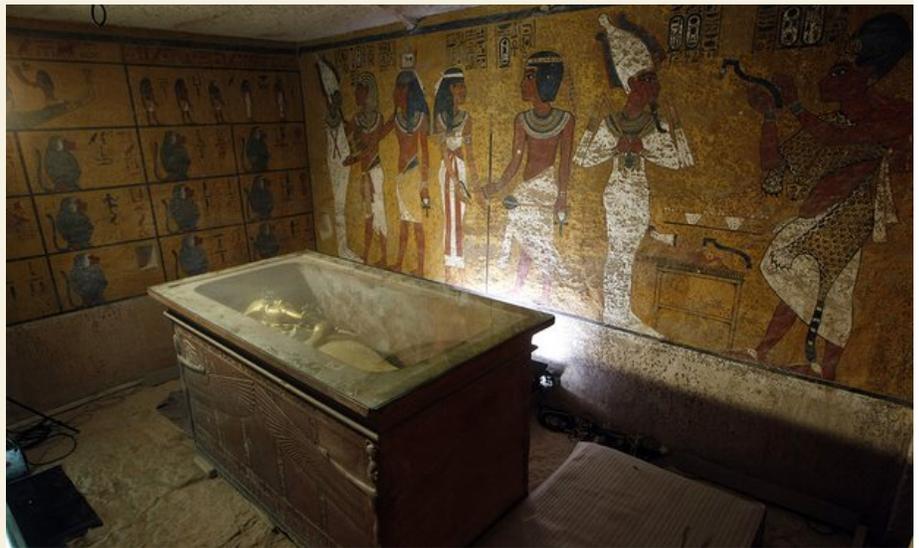
In 1925, archeologist Howard Carter found two daggers, one iron and one with a blade of gold, within the wrapping of the teenage king, who was mummified more than 3,300 years ago. The iron blade, which had a gold handle, rock crystal pommel and lily and jackal-decorated sheath, has puzzled researchers in the decades since Carter's discovery: ironwork was rare in ancient Egypt, and the daggers metal had not rusted.

Italian and Egyptian researchers analyzed the metal with an x-ray fluorescence spectrometer to determine its chemical composition, and found its high nickel content, along with its levels of cobalt, "strongly suggest an extraterrestrial origin." They compared the composition with known meteorites within 2,000km around the Red Sea coast of Egypt, and found similar levels in the meteorite.

The meteorite, named Kharga, was found 150 miles (240km) west of Alexandria, at the seaport city of Mersa Matruh, which in the age of Alexander the Great- the fourth century BC- was known as Amunia.

The researchers published their findings on Tuesday in the journal *Meteoritics & Planetary Science*. Although people have worked with copper, bronze and gold since 4,000BC, ironwork came much later, and was rare in ancient Egypt. In 2013, nine blacked iron beads, excavated from a cemetery near the Nile in northern Egypt, were found to have been beaten out to meteorite fragments, and also a nickel-iron alloy. The beads are far older than the young pharaoh, dating to 3200BC.

"As the only two valuable iron artifacts from ancient Egypt so far accurately analyses are of meteoritic origin,"



the team that studied the knife wrote, "we suggest that ancient Egyptians attributed great value to meteoritic iron for the production of fine ornamental or ceremonial objects."

The researchers also stood with a hypothesis that ancient Egyptians placed great importance on rocks falling from the sky. They suggested that the finding of a meteorite-made dagger adds meaning to the use of the term "iron" in ancient texts, and noted around the 13th century BC, a term literally translated as "iron of the sky" came into use...to describe all types of iron."

"Finally, somebody has managed to confirm what we always reasonably assumed," Thilo Rehren, an archaeologist with University College, London, told the Guardian.

Rehren, who studied the nine meteoritic beads, said "there never has been a reason to doubt this outcome but we were never really able to put this hard data behind it."

*continued on next page*

## Dagger in Tutankhamun's tomb

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"Yes, the Egyptians referred to this stuff as metal from heaven, which is purely descriptive," he said. "What I find impressive is that they were capable of creating such delicate and well manufactured objects in a metal of which they didn't have much experience."

The researchers wrote in the new study: "The introduction of the new composite term suggests that the ancient Egyptians were aware that these rare chunks of iron fell from the sky already in the 13th century BCE, anticipating Western culture by more than two millennia."

Egyptologist Joyce Tyldesley, of the University Manchester, has similarly argued that ancient Egyptians would have revered celestial objects that had plunged to earth.

"The sky was very important to the ancient Egyptians," she told *Nature*, apropos of her work on the meteoritic beads. "Something that falls from the sky is going to be considered as a gift from the gods."

The high quality of the blade suggests that Tutankhamen, who lived during the latest stage of the Bronze Age, was supported by iron workers who were skilled despite the relative rarity of the material.

The blade may not be the only item derived from falling rocks on Tut's person.

In 2006, an Austrian astrochemist proposed that an unusual yellowish gem, shaped as a scarab in King Tut's burial necklace, is actually glass formed in the heat of a meteorite crashing into sand.

"It would be very interesting to analyze more pre-Iron Age artifacts, such as other iron objects found in King Tut's tomb," Daniela Comelli, of the physics department at Milan Polytechnic, told *Discovery News*. "We could gain precious insights into metal working technologies in ancient Egypt and the Mediterranean."



UPCOMING EVENTS



June 2016

**June 18,** 9-5- Region IV Potluck Picnic and Rock Swap/Sale. See flyer on next page or contact Dave Lines at 240-427-7062 or [dave.lines@earthlink.net](mailto:dave.lines@earthlink.net)

**June 24-26-** Treasures of the Earth Gem, Mineral, Jewelry, Fossil and Bead Show and Sale- Fishersville VA at The Augusta Expo Center. (I-64, exit 91) [www.toteshow.com](http://www.toteshow.com) for details.

**July 9-10-** 50th Anniversary Gem World sponsored by the Gem & Mineral Society of Syracuse. SRC Arena, Onondaga Community College, Syracuse, NY. Contact: Dick Lyons [show@gmss.us](mailto:show@gmss.us)

**July 30-31-** 37th Annual Champlain Valley Gem, Mineral & Fossil Show sponsored by the Burlington Gem & Mineral Club. Tuttle Middle School, 500 Dorset st. S. Burlington, VT. Contact Jeff Higgins- 802-849-6076

**Sept. 23-25-** 49th annual Shenandoah Valley Gem & Mineral Society Gem, Mineral, Fossil, and Jewelry Show- Augusta Expo, 277 Expo Rd. Fishersville, VA. Friday 2-6; Saturday 10-6; Sunday 11-5.

**Sept. 24-25th-** 52nd Annual Atlantic Coast Gem, Mineral, Jewelry, & Fossil Show hosted by the Gem Cutters Guild of Baltimore.

SUN	MON	TUES	WED	THURS	FRI	SAT
			1	2	3	4
5	6 <i>D-Day</i>	7	8	9	10	11
12	13	14 <i>Flag Day</i>	15 <b>Meeting 7PM</b>	16	17	18 <b>Region IV Picnic</b>
19 <i>Fathers Day</i>	20	21	22	23	24	25 <b>Field Trip</b>
26	27	28	29	30	<b>Congrats Graduates</b>	

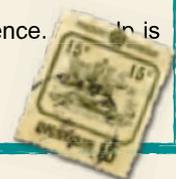
REMINDER...

Club workshops are held on the second Saturday of each month at Dave Callahan's home. Workshops are open to members only, and all members are encouraged to attend when possible.

There will be some discussion at this months meeting about possibly offering other days for the workshops also.

This is a great learning & fellowship opportunity, as well as a way to contribute to your club. You can "learn" while helping to fabricate items for sale at our fall festival, then use the equipment available to complete your own personal pieces.

Please consider coming out, regardless of your level of experience. Your help is needed and appreciated!

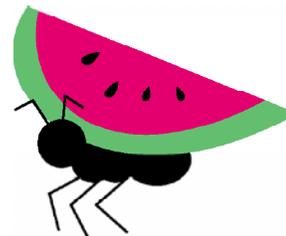


The Southern Maryland Rock & Mineral Club is proud to sponsor the 2016 Eastern Federation of Mineralogy and Lapidary Societies (EFMLS)

**Region IV Potluck Picnic  
and Rock Swap/Sale**



**Gilbert Run Recreational Park**  
Charlotte Hall, MD



**Saturday, June 18, 2016**  
9 am - 5 pm

**Admission to the Park is \$5 per carload**  
(No charge for swapping or selling)

*"This is an old-fashioned rock swap where people who collect rocks, minerals and fossils will be selling and trading specimens"*

**Details**

This is a free event for all EFMLS rock club members and their families and friends. In addition to minerals, fossils and lapidary for swap/sale each attendee/family is asked to bring a potluck dish to share, and one labeled specimen donation for an auction that will take place after lunch. The auction will help defray the cost of the event. There is ample parking for tailgate swapping/selling. Please bring your own tables and chairs. There are onsite restrooms and handicap access. Donations of excess rocks and related tools to the "Treasure Box" are welcomed and are free for anyone to take. The Southern Maryland Rock and Mineral Club will provide plates, cups, plasticware, sodas, and bottled water.

**Schedule of Events**

9:00 - 12:00 Swap and sell  
12:00 - 1:30 Potluck Lunch and Auction  
1:30 - 5:00 Swap and sell

Contact Person: Dave Lines (240)-427-7062

[Dave.Lines@earthlink.net](mailto:Dave.Lines@earthlink.net)

**Address:**  
**Gilbert Run  
Recreational Park**  
13140 Charles Street  
Charlotte Hall, MD,  
20622

**Directions:**

**From the D.C. Beltway:**

Take Rt. 5 South (Exit 7A) towards Waldorf  
Go 12.3 miles and turn left onto Mattawoman Beantown Rd. (Rt.5)  
Go 3.2 miles and turn left onto Leonardtown Rd. (Rt.5).  
Go 4.9 miles and turn right on Olivers Shop Rd.  
Go 5.9 miles and turn left onto Charles St. (Rt 6)  
Go 1 mile and turn left into Gilbert Run Recreational Park

**OR**

Take Rt. 301 to La Plata, turn left onto Charles St (Rt 6 East) and go 8.6 miles to Gilbert Run Recreational Park  
Turn left into Gilbert Run Park and follow the signs to the Hilltop Pavilion Parking lot.

**From La Plata, Md**

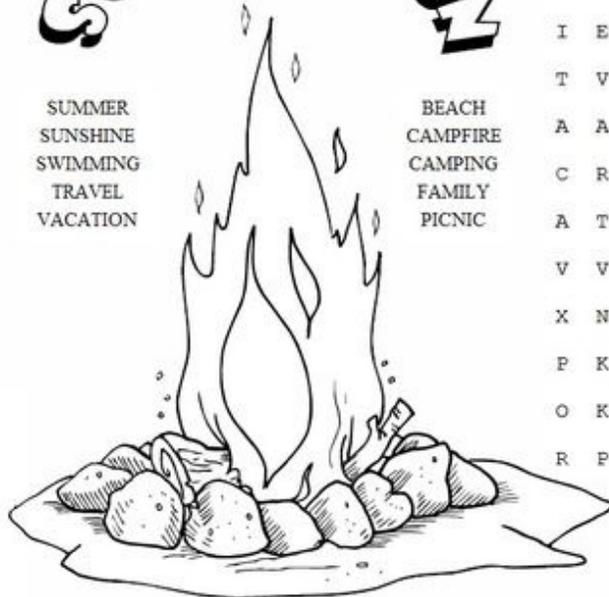
From Rt. 301, take Rt. 6 East (Charles St) 8.6 miles  
Turn left into Gilbert Run Park and follow the signs to the Hilltop Pavilion Parking lot.

Rock Raiders

SUMMER FUN

SUMMER  
SUNSHINE  
SWIMMING  
TRAVEL  
VACATION

BEACH  
CAMPFIRE  
CAMPING  
FAMILY  
PICNIC



WORD SEARCH

N K Z F L T C P L D W L  
O L W I E R I F P M A C  
I E S H D U B I J X G G  
T V M U K J K E C H N I  
A A F G N Q Q P A I A L  
C R W A E S P D M C P D  
A T Z T M J H M G P H S  
V V R Y C I I I J D R U  
X N G J Z W L C N K T M  
P K M V S T J Y L E R M  
O K T U G N I P M A C E  
R P I C N I C W C O C R

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Moh's Hardness Scale

1	2	3	4	5	6	7	8	9	10
<b>TALC</b> very soft, like chalk	<b>GYPSUM</b> easily scratched with a nail	<b>CALCITE</b> difficult to scratch with a nail	<b>FLUORITE</b> cannot be scratch with a nail	<b>APATITE</b> about the hardness of teeth	<b>MICRO- CLINE</b> suitable for gems	<b>QUARTZ</b> scratches glass	<b>TOPAZ</b> harder than quartz	<b>RUBY</b> harder than to- paz	<b>DIAMOND</b> hardest material known to man
← soapstone			← serpentine		leopard stone	← verdite			
			← cobalt		← butter jade & red jasper				
			← opal stone		← springstone				

## Up Coming Field Trips

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**EQUIPMENT:** The Boxley Quarries are very safety-conscious. **Standard quarry PPE (Personal Protective Equipment) gear is required or you will not be permitted to enter the quarry.** Hard hat (see mfg. date below), **steel-toe boots** (no exceptions), **safety glasses** and **good common sense is required.** Also good protective clothing and gloves must be worn. A set of **wheel chocks or a suitable rock** must be used when parked to be in compliance. The vehicle must be in park and the parking brake applied when leaving the vehicle. It could be very cold, wet or hot in the quarry, so dress according to the weather forecast that morning. Be sure to bring plenty of water and snacks. Bring your own collecting equipment such as rock hammers, chisels, buckets and newspaper to wrap your delicate specimens. We will be allowed to drive into the quarry. Bring rain gear in case of bad weather. **HARD HAT**

**NOTICE: CHECK THE MANUFACTURE DATE, LEFT SIDE, UNDER THE BRIM IN THE SMALL CIRCLE ON EITHER SIDE OF THE ARROW.** If you see a 1 on either side it was made in 2011, a 0/9 is 2009 and out of date. If it's older than 5 years, it must be replaced. This is a new Federal rule enforcement. **You must comply or you will be rejected.**

**AGE LIMIT:** All children will be allowed but it will be the parent's responsibility to keep them under tight control at all times and see that they obey all the safety requirements. **The same dress and PPE requirements apply.** If they don't comply, don't bring them!

**NOTE:** Severe weather or other crisis out of our control may result in the canceling or rescheduling of this trip. If there is any question, please call me to confirm the trip.



### Dixie Mineral Council Field Trips

The Southeast Federation of Mineralogical Societies, Inc



The Friendly Federation - Founded in 1976 to serve  
DMC Program of the SFMS Field Trip Committee  
Copyright © All rights reserved.

**An Official Field Trip of the Tennessee Valley Rock and Mineral Club (Chattanooga, TN) (HOST)**  
**An Official Field Trip of the (enter your associated club's name here!)**

**Ross Creek**  
**Gruetli-Laager**  
**Grundly County, TN**  
**Saturday, July 9, 2016**  
**8:00 AM Central Time**

**COLLECTING:** Pennsylvanian and Mississippian plant fossils with various lycophyta, pteridophyta, and pteridospermophyta.

**BRING:** Site is easily accessed, but summer is hot and snakes are native to the area, poison ivy is ubiquitous, and the site is in a creek. Bring water, snacks, and dress appropriately. You will need light digging tools, bucket,

and gloves. There are no facilities or nearby food establishments.

#### **DIRECTIONS AND WHERE TO MEET:**

Exit 134 off I-24 at Monteagle, TN

Meet in the Hardees parking lot at 8:00 a.m. central time

Depart in convoy to site at 8:15 a.m. central time

Phone service is problematic

**CONTACT:** Charlie Jones  
423-842-6441 or cell 423-653-4479

I'll have information at the meeting.

## How Rock Collecting Helps Kids: Our Responsibility

by Dr. Gary Lohman, EFMLS Junior Chair

reprinted from EFMLS News, May 2016

Nearly every rockhound I meet is eager to explain how their interest in rocks, minerals, or fossils started when they were young. In fact, prior to the development of an increasingly media-driven society, hobbies like rock collecting were an important part of both personal and social development. With all the time spent watching television, playing video games, and tethered to social media, the sad reality is that many of today's children have never experienced the rewards of a hobby. To be clear, a hobby is not the same as organized, adult-directed, after-school activities such as Little League. Hobbies are an important means of self-discovery and expressions of personal accomplishment that help build self-esteem and resilience. Working on hobbies teaches children how to learn about things, how to set goals, make decisions, and develop a variety of problem-solving skills. Hobbies often mature into lifelong interests and sometimes even careers.

Consider how thirty-plus years ago almost every kid in your neighborhood had some sort of hobby, whether it was trading baseball cards, mounting butterflies, or collecting things like stamps, or rocks. A young colleague recently expressed the financial motivation behind his degree in electrical engineering and his current interest in pursuing a master's degree in business to make him more promotable. This was in stark contrast to an older colleague, also with a degree in electrical engineering, who expressed his start in "building radios" as a child and now dissatisfied with a career that increasingly pulls him away from his technical "roots." Similar to the way trees need solid roots to grow tall and stand strong, kids need hobbies to help them develop life-long "roots" as well.

As rockhounds, we already recognize the value of our hobby, so how do we help children today develop and sustain hobbies?

Having participated in events with a variety of displays and demonstrations at a number of venues with children over the past years, I am repeatedly reassured that kids still have innate curiosities for which hobbies form a way of tapping into. The child-like curiosity that is still awakened in us as adults through the pursuit of our hobbies is a necessary ingredient. Fortunately, geology remains fashionable among kids. Collecting rocks is interesting and learning how those rocks are geological windows into our own past is even better. Kids love to recognize patterns in nature.

Cultivating a hobby takes "spare time," which is arguably the first casualty of media-driven distractions and tightly packed schedules of organized activities in today's world. Consider that by age 15, the average child has spent more time watching television than sitting in a classroom. Add to that the addictive-like effects of video games and the tether-like effect of social media and texting, and one quickly recognizes that potential "spare time" is rapidly consumed by a craving for stimulation—even to a point of over-stimulation. Childhood is followed by the adult pressures of making a living with increasingly demanding schedules. If one never learned how to appreciate and make use of "spare time" with hobbies as a child, it's not likely to be an integral part of adult life either. Hence, the first challenge is making room for "spare time."

Un-tethering the child, even for a little while, from his or her media-fed environment does not have to involve draconian parental controls accompanied by screaming and door slamming. The key is to (1) set an example by making time ourselves as adults and (2) taking advantage of that time to tap into a shared child-like curiosity. This is where family-oriented events like rock shows, county fairs, STEM expos, etc. can be very important venues to help explore interests together. This is also where it is important for our clubs and their memberships to continue hosting and participating in such events. In today's financially-obsessed world, it is easy to forget that the real "value" of these events is not measured by their profitability in a purely monetary sense. The last STEM expo in which I participated with a

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## How Rock Collecting Helps Kids: Our Responsibility

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10X20 blackout tent filled with UV lights and fluorescent minerals captivated the interest of children and their parent's innate curiosity alike! Asking questions together, many became interested in the glowing rocks and how they could get involved also. By setting the example as role models and being prepared to provide encouragement and guidance, there is still room for hobbies in today's world. The good news is that activities like this psychologically free kids from being merely glued to computers and cell phones all day! When given the chance, children embrace the opportunity to get back to those interest we used to call "hobbies."

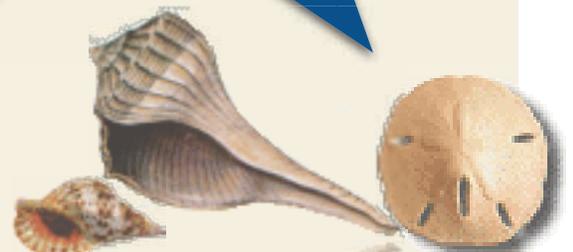
For want of spare time, a hobby may never develop. It takes a village as helping to make that "spare time" reality involves the time and effort of our clubs and its members supporting each other, parents, and children. The reward is that by helping a child to find a hobby, a talent may be born and a life enriched. In future articles, I intend to further explore how to inspire and guide children of different ages within the hobby.

## Welcome New Members:



*Carr Harris from  
Manquin, VA*

*Mark,  
Belinda, Eve & Cassidy  
Goode from  
Huddleston,  
VA*



## From the First V.P.

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Slight modifications have been made since then, but angles for "ideal" cut diamonds are still similar to Tolokowsky's formula. Round brilliants cut before the advent of "ideal" angles are often referred to as "Early round brilliant cut" or "Old European brilliant cut" and are considered poorly cut by today's standards, though there is still interest in them from collectors. Other historic diamond cuts include the "Old Mine Cut" which is similar to early versions of the round brilliant, but has a rectangular outline, and the "Rose Cut" which is a simple cut consisting of a flat, polished back, and varying numbers of angled facets on the crown, producing a faceted dome. Sometimes a 58th facet, called a *culet* is cut on the bottom of the stone to help prevent chipping of the pavilion point. Earlier brilliant cuts often have very large culets, while modern brilliant cut diamonds generally lack the culet facet, or it may be present in minute size.

### Cutting facets

The art of cutting a gem is an exacting procedure performed on a [faceting machine](#). The ideal product of facet cutting is a gemstone that displays a pleasing balance of internal reflections of light known as *brilliance*, strong and colorful *dispersion* which is commonly referred to as "fire," and brightly colored flashes of reflected light known as *scintillation*. Typically [transparent to translucent](#) stones are faceted, although [opaque](#) materials may occasionally be faceted as the *luster* of the gem will produce appealing reflections. [Pleonaste](#) (black [spinel](#)) and black diamond are examples of opaque faceted gemstones.



### Facet angles

The angles used for each facet play a crucial role in the final outcome of a gem. While the general facet arrangement of a particular gemstone cut may appear the same in any given gem material, the angles of each facet must be carefully adjusted to maximize the optical performance. The angles used will vary based on the [refractive index](#) of the gem material. When light passes through a gemstone and strikes a polished facet, the minimum angle possible for the facet to reflect the light back into the gemstone is called the *critical angle*.<sup>[3]</sup> If the ray of light strikes a surface lower than this angle, it will leave the gem material instead of reflecting through the gem as brilliance. These lost light rays are sometimes referred to as "light leakage", and the effect caused by it is called "windowing" as the area will appear transparent and without brilliance. This is especially common in poorly cut commercial gemstones. Gemstones with higher refractive indexes generally make more desirable gemstones, the critical angle decreases as refractive indices increase, allowing for greater internal reflections as the light is less likely to escape.

### The faceting machine

This machine uses a motor-driven plate to hold a precisely flat disk (known as a "lap") for the purpose of cutting or polishing. Diamond abrasives bonded to metal or resin are typically used for cutting laps, and a wide variety of materials are used for polishing laps in conjunction with either very fine [diamond powder](#) or oxide-based polishes. Water is typically used for cutting, while either oil or water is used for the polishing process. The machine uses a system generally called a "mast" which consists of an angle readout, height adjustment and typically a gear (called an "index gear") with a particular number of teeth is used as a means of setting the rotational angle. The angles of rotation are evenly divided by the number of teeth present on the gear, though many machines include additional means of adjusting the rotational angle in finer increments, often called a "cheater". The stone is bonded to a (typically metal) rod known as a "dop" or "dop stick" and is held in  
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place by part of the mast referred to as the "quill".

### The modern faceting process

The doped stone is ground at precise angles and indexes on cutting laps of progressively finer grit, and then the process is repeated a final time to polish each facet. Accurate repetition of angles in the cutting and polishing process is aided by the angle readout and index gear. The physical process of polishing is a subject of debate. One commonly accepted theory is that the fine abrasive particles of a polishing compound produce abrasions smaller than the wavelengths of light, thus making the minute scratches invisible. Since gemstones have two sides (the crown and pavilion), a device often called a "transfer jig" is used to flip the stone so that each side may be cut and polished.[3]

### Other methods

Cleaving relies on planar weaknesses of the chemical bonds in the crystal structure of a mineral. If a sharp blow is applied at the correct angle, the stone may split cleanly apart. While cleaving is sometimes used to split uncut gemstones into smaller pieces, it is never used to produce facets. Cleaving of diamonds was once common, but as the risk of damaging a stone is too high, undesirable diamond pieces often resulted. The preferred method of splitting diamonds into smaller pieces is now sawing.[2]

### Natural faceting

Many crystals naturally grow in faceted shapes. For instance, common table salt forms cubes and quartz forms hexagonal prisms. These characteristic shapes are a consequence of the crystal structure of the material and the surface energy, as well as the general conditions under which the crystal formed.

The Bravais lattice of the crystal structure defines a set of possible "low-energy planes," which are usually planes on which the atoms are close-packed. For instance, a cubic crystal may have low-energy planes on

the faces of the cube or on the diagonals. The planes are low-energy in the sense that if the crystal is cleaved along these planes, there will be relatively few broken bonds and a relatively small increase in energy over the unbroken crystal. Equivalently,

these planes have a low surface energy. The planes with the lowest energy will form the largest facets, in order to minimize the overall thermodynamic free energy of the crystal. If the surface energy as a function of the planes is known, the equilibrium shape of the crystal may be found via the Wulff construction.

Growth conditions, including the surface the crystal is growing on top of (the substrate), may change the expected shape of the crystal; for instance, if the base of the crystal is under stress from the substrate, this may favor the crystal growing taller rather than growing outwards along the substrate. The surface energy, including the relative energies of the different planes, depend on many factors including the temperature, the composition of the surroundings (e.g. humidity), and the pressure.

An older and more primitive style of faceting machine called a jamb peg machine used wooden dop sticks of precise length and a "mast" system consisting of a plate with holes carefully placed in it. By placing the back end of the dop into one of the many holes, the stone could be introduced to the lap at precise angles. These machines took considerable skill to operate effectively.[3]

Another method of facet cutting involves the use of cylinders to produce curved, concave facets. This technique can produce many unusual and artistic variations of the traditional faceting process.

Happy Hunting,  
Jack Curtin



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Natalie Darling, Editor  
211 Chesterfield Rd.  
Lynchburg, VA 24502



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*MEETING LOCATION*

*DIRECTIONS: Fairview Center;  
3621 Campbell Ave., Lynchburg, VA 24501  
434-847-1751~ From Route 29 expressway or Route  
460, take the Campbell Avenue Exit. Follow Campbell  
Ave. to 3621, which is across the street from a Citgo  
Gas Station. There is a fence around the building and  
parking on both streets running along the sides of the  
property as well as a lot in the back. We will be  
looking for you!*