

Rocky Reader

<http://www.rockyreader.com>



The Monthly Newsletter of the Toledo Gem and Rockhound Club

Volume 49 – Issue 1

January 2012

President

Steve Shimatzki 567-868-8794
sjs132@accesstoledo.com

Vice-President

John Capuano 419-882-1733
jscapuano@yahoo.com

Treasurer

Shirley Stieb 419-480-1591
[sstieb828@gmail.com](mailto:ssstieb828@gmail.com)

Secretary

Mike Mayers 419-885-5613
glassman@buckeye-express.com

Sgt.-At-Arms

Natalie Hill 734-269-6414
njhill@chartermi.net

Board Members

Harold Burleson 419-533-7341
Mike Burcewicz 419-478-9463
Elie Ghanime 419-824-5070

Past President

Jerri Heer 419-344-9999
jheerx6@aol.com

Show Chairperson

Suzanne Shimatzki 419-861-0147
sshimatzki@gmail.com

Membership (interim)

Steve Shimatzki 567-868-8794
sjs132@accesstoledo.com

Editor

Suzanne Shimatzki 419-861-0147
editor@rockyreader.com

Sunshine

Joe Motter 419-691-2793
joepat1962@buckeye-express.com

Craft Center

419-531-8124

Having lost our club member Mike Burcewicz on December 25th, it is hard to be upbeat at the start of this New Year. Someone once asked me why I wanted to be president and I said that I didn't, but I love the club and the people in it. Mike was one of those people. It is a commitment by people like Mike that makes our club so strong. Demonstrating knapping during the annual show, Sylvania fossil fest, a Board Member, and wiring the hot water tank are just some of the many contributions Mike made to the club. He will be missed and all that knew him will hold his memory dear. I now have the sad task of filling that Board position. If you think you have what it takes to step up and help guide the club, please let me know so that we can consider you.

Looking towards the future, I hope everyone has a happy new year! I would also hope you take this opportunity at the new year to renew commitments to friends and yourself. These resolutions are easy to pick but sometimes the hardest to keep. Mine will be to do the best that I can for the club in my new position. Please remember that the club and I may need your help to achieve that resolution throughout the coming year. Mike's passing and Jerri moving to Florida proves we cannot just assume "somebody else" will do it. It takes many people in many ways to make the club, but if we all contribute when we can, then the club will always remain healthy.

Steve Shimatzki, President

GREETINGS FROM FLORIDA

Our past president, Jerri Heer, has moved to Florida this past month. If you wish to stay in contact with her, here is her new address:

Jerri Heer, 7301 N. Howard Av, Tampa, FL 33604
Cell Phone: 419-344-9999, email: jheerx6@aol.com

TG&RC T-SHIRTS AVAILABLE

There are only 2 club t-shirts left! 1 size small and 1 size medium are available WITHOUT pocket for \$6 each. If you are interested, contact Steve Shimatzki.



TG&RC MEETING MINUTES – December 21, 2011

President Jerri Heer called the meeting to order at 7:40 pm and began with the Pledge of Allegiance.

Secretaries Report: Moved for approval: Tom Marok. Seconded by: Ed Reynolds. Motion carried.

Treasurer's Report: Moved for approval: Tom Marok. Seconded by: Elie Ghanime. Motion carried.

Old Business: Electronic lock installation planned for January 2012. Hearlding was a great success, thanks to Elie, Jeff, Harold and all who helped move cabinets out and rearrange the Craft Center.

New Business: Phone has been repaired at the Craft Center

Group Reports:

TBG Liaison: no plans for near future

Gemcrafters: Thursdays Tom Marok is returning assisted by Joe Motter

Metalcraft: Still on hiatus, watch the Rocky Reader

Faceteers: Board has approved a Faceteers auction in July each year

Extreme Beaders: watch the Rocky Reader

Beaders: On hiatus until the weather improves. Watch the Rocky Reader.

Juniors: Had a great Christmas party with games and a lot of fun. Lucette Jones and Tom Marok will be moderators. Meeting time will stay the same on the fourth Sunday Noon to 2 pm.

Rocky Reader: Deadline is Monday of week after the meeting

Membership: 30 members, 2 juniors and a guest or two

Sunshine: Mike Burcewicz we remember you in our prayers

Field Trips: None planned

Open house: Planned for May 19 – 20, 2012

Show: Contract has been signed and returned to Stranahan, date for 2012 is September 7 – 9

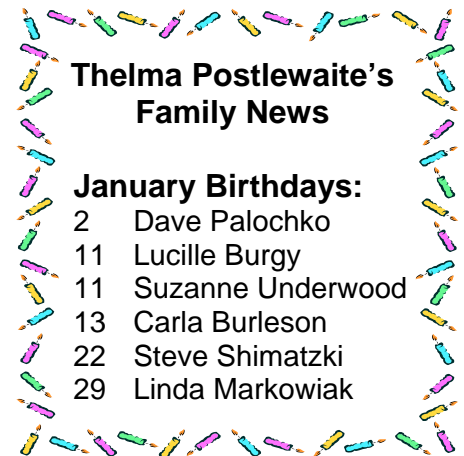
Presidents Award: Congratulations to Carla and Harold Burleson!

Lifetime Achievement Award: Congratulations to Ed Reynolds!

Installation of New Officers: President Steve Shimatzki, Vice President John Capuano, Treasurer Shirley Stieb, Secretary Mike Mayers, Elie Ghanime Board Member, Natilie Hill Sergeant at Arms

Refreshments for February Meeting: Tom Marok – Thanks!

Meeting adjourned at 8:15 pm.



Respectfully submitted by, Mike Mayers, Club Secretary

TUCSON GEM & MINERAL SHOW

Tucson Gem and Mineral Show is scheduled for February 12 thru 19, 2011. It is THE SHOW to visit. If you can make the trip, go! You won't regret it. Don't forget, it's a big show with lots of opportunities to buy and ship back home. The challenge will be covering the entire show in those three days.

Additional information on February's show can be found by visiting <http://www.tgms.org/2012show.htm>. Pass this along to others you feel may enjoy the opportunity too.

DAYTIME GEMCRAFTERS

Meeting every Thursday except Thanksgiving from Noon to 4 PM at the Craft Center. Chet King will be helping to moderate, as Tom Marok will be out of commission for a couple of months due to surgery. If your daytime hours are free, come join us!



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GEMCRAFTERS

All new members or existing members that need to work in the Gem-craft center to cut and polish cabochon **for the first time**, please call or email Elie or Chet to schedule a meeting slot for your training to complete your first cabochon AND PLEASE LEAVE YOUR FULL NAME AND CONTACT INFORMATION.

METALCRAFTERS

Thank you all for being so patient waiting for the car to be out of the shop. Regular meetings and classes will resume on January 12, continuing on the 15th and 26th. Sunday meetings are from 1:30 - 3:30 and Thursday meetings are from 6:30 - 8:30. **If you HAVE NEVER ATTENDED**, please call or e-mail me (debhoffmaster@gmail.com) to schedule a three meeting slot to complete the instructional pendant. When you do so, please LEAVE YOUR FULL NAME AND CONTACT INFORMATION.

Also, if bad weather is forecast or actually happening, please check your e-mail an hour before the scheduled starting time to see if the meeting is cancelled. I'd rather avoid another accident.

Deb Hoffmaster, Metalcraft moderator

JUNIORS

Junior Rockhounds welcome new moderators Lucette Jones and Tom Marok. Both were present for our end of year party. Meetings will continue on the fourth Sunday of each month. Next meeting will be Sunday, January 22. Contact Tom at motromak@aol.com or 419-704-3996, or Lucette at agarden_gal@yahoo.com or 419-474-3425.

CLASSES

The following schedule is a listing of upcoming classes. To enroll, please send fees to the instructor three weeks prior to the class.

January 21, 2012 10AM. Chased and hydraulically formed cuff bracelet. (5 spots open) Instructor Debra Hoffmaster. Fee \$20.00. Use the hydraulic press to raise a cuff bracelet from a strip of chased metal. Participants will need to supply a 2.5" X 6" strip of 24 gage copper or Argentium silver.

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February 18, 2012 10AM. Clasps, Clasps, Clasps. (FULL) Instructor Debra Hoffmaster. Fee \$20.00. Not all clasps are hard to make. Learn to make a variety of simple hook and eye or toggle clasps for bracelets and necklaces. A list of the necessary materials will be available upon registration.

March 17, 2012 10AM. Chainmaille. (5 spots open) Instructor Kathy Petersen. Fee \$20.00. The chainmaille project for March 17, 2012, is a variation on the Backbone bracelet that we did a few years ago. It can be seen on the Blue Buddha Boutique website, <http://www.bluebuddhaboutique.com/supplies/instruction/view.php?id=tunnel> where materials can also be purchased. It is referred to as Illuminated Tunnel. Depending on your choice of materials, the cost is quite variable. If you want to make a larger version, information regarding sizes to order and sources can be obtained from the instructor, Kathy Petersen. Remember, you are responsible for purchasing and bringing your own materials, clasp and hand tools.

April 21, 2012 10AM. Fold Forming. Instructor Debra Hoffmaster. (3 spots open) Fee \$20.00. Learn to fold metal to create surface texture and volume. A list of the necessary materials will be available upon registration.

April 28, 2012 10AM. Enameling. (3 spots open) Instructor Harriet Nearing. Fee \$40.00 - payable to Debra Hoffmaster. Learn to enamel on flat and fold-formed copper. You do not have to have taken the fold forming class to register for this one.

FRED'S FINDINGS

Happy New Year!! I hope everyone had a great holiday and Christmas.

I was talking with Steve the other day about what gems to glean from my readings, and trying to focus on what to write. There are some good articles to share, jokes and I even "discovered" why Jerri would move to Florida, besides the warm tropical sun and beaches! But, if you have any suggestions I will try to put what you want together from my readings.

Last article I mentioned that there is a faceting cut in every bulletin I have read and I tracked down and checked out some of the resources for more information. I didn't come across any "bugs" and wanted to share these sites. The first, <http://www.rockhounds.com/rockshop/table.shtml>, has a lot of info for all interest and there are links to other resources (I did not check them all). There are classifieds and references for just about everything. They have a link for software which contains a program called Gemcad. This is a design program for faceters to produce a cutting pattern. There are also links to folks who have gem designs which open in this program or in a PDF format. Elie also gave me a link, <http://www.gemstoneartist.com/Designs.asp>, which has bunches of designs. And to get more great tips from Elie, don't forget to sign up and take the faceting class!!

For metal workers, a bit on Patinas. Patina is a layer of corrosion produced on the surface of metal through a chemical process like oxidation. On jewelry it is used to produce color, texture or both. If you want any type of pattern on the metal however, do it before you treat your metal, as you can knock off the "corrosion" build up reducing its effect.

Depending on the chemicals used, you can produce blacks, greens, reds, yellows, whites or blues. Using vinegar on copper will produce a simple green patina and is easy to do. Cupric Nitrate, Cobalt Nitrate, Potash,

Liver of Sulfur, Copper Sulfate, Potassium Sulfide, Ammonium Sulfide, and Ferric Nitrate are used to produce the different colors. Heating the metal to around 400 degrees helps to speed up the process and as the metal cools the colors will stand out. Patinas are fragile and require sealing to protect the finish or they can flake off, and flake off is not good on cloths or people! Lacquer is the typical coating used to seal the Patina and protect your work.

And remember to follow all directions for use, found on the chemicals, including using safety glasses and proper ventilation. (taken from The Pegmatite, June/July/Aug 2010, Vol. LXIII, pg. 5 and Wikipedia, on Patina).

Lastly, why is Jerri really leaving (my personal opinion, not necessarily related to the true reason); the reason is Beach Glass! Just read the following for my proof:

Beach Glass – People are very serious about collecting it!

from The Pegmatite, January 2011, Vol.LXV, pg 11

The North American Sea Glass Association (NASGA) holds an annual contest with multiple categories that grant high dollar prizes! First place for Shard of the year wins \$1,000. The 2010 prize was awarded for a beautiful orange and yellow piece. It almost looks like candy! (no photo available). Check out the website at <http://www.seaglassassociation.org/>

Greens and browns are common. Blues are harder to find. Cobalt or con-flower blues although rare, can be exquisite. Aqua and seafoam are even more rare but are widely pursued for home décor projects. Most purples were originally clear, the manganese in them slowly oxidized. Yellow and oranges and ultra-scarce red are the most sought after colors.

Hobbyists affectionately known as: shardheads, glass heads, shard patriarch, godfather of sea glass, all are very protective about their “target-rich environments”. It takes 30 years of wave action and high water ph to pit surfaces and smooth edges. Some of these target-rich environments (tre’s) are on deserted shores where ships have run aground many years past. Late summer and fall storms turn up the biggest selection of treasures.

For a nice slide show go to parade.com/seaglass.

Rocky trails, Fred
geodestogemstones@gmail.com



Jerri Heer presents the President’s Award to Harold & Carla Burluson during the Dec meeting.



Jerri Heer presents Ed Reynolds with the Lifetime Achievement Award during the Dec meeting.

How Big Is Lightning?

a publication of the World Gem Society 13.December.2011

Chris Johnston helps us understand one of nature's wonders.....Fulgurite.



Have you ever sat out on a summer afternoon watching an approaching thunderstorm and enjoyed the awesome display of power that it produces as lightning? That amazing display can be mesmerizing as the bolts take infinite shapes and travel in infinite directions, sometimes traveling through the sky and sometimes appearing to go straight into the earth as you see at left.

Lightning can turn night into day. Cause fiery damage in one place while striking others leaving little evidence that the event ever occurred.

But have you ever wondered exactly how big is lightning? The bolts we see going across the skies invoke mythical stories of Zeus throwing lightning bolts as a show of his supreme power.

But if you could “pull a Zeus” and throw a lightning bolt, is your hand really big enough to hold one? Just How Big Is Lightning?

To answer this question we asked for assistance from our good friend, Christopher Johnston. Chris is the geologist who wrote the definitive report on Oregon Sunstone at the Ponderosa Mine, and is now located in Omaruru, Namibia still working in the gemstone industry. But more important to us for this story is that Chris is also a world class photographer. I had noticed some great shots of lightning in Chris' website, so I sent him a note asking if he could supply us with a look at lightning in Africa to help us understand the phenomenon. All of the lightning images you see in this report are from Chris in Africa.



Looking at the various images we can count at least six (6) major lightning strikes to the ground. Which gives us cause to wonder: Wouldn't this leave some kind of tell-tale mark to let us know just how big a bolt of lightning really is?

The answer is...yes! But for that answer we need to travel half way around the world to Florida in the USA. You see, Florida is the world leading location for lightning strikes, and not just because there are a lot of golfers there holding up 9 iron lightning rods. Florida is uniquely located in a weather pattern that generates a lot of afternoon thunderstorms. Having lived in Naples I can tell you that one can almost set their watch by the afternoon thunderstorms at 1500hrs each day.



But why does that help us know how big lightning is? Well, Florida has lots of sandy beaches. Sand is silica. Silica can be melted by lightning. Florida has lots of lightning. So it is only logical to assume that some of the lightning strikes would hit the sand, melt the silica, and create some kind of footprint of the lightning strike.

And that is exactly what we have at left. This is called a “fulgurite” in the mineralogical circles. The lightning bolt hit the sand and fused the sand into silica glass of sorts. As you can see, this particular lightning bolt was smaller in diameter than a US dime. Not only that, it was not round at all. In fact, it was quite weird in shape and would be very difficult to hold in your hand...well, if you were Zeus, that is.

Below is a larger look at our lightning bolt. This is a small one compared to some you can find on the market. But at least it lets us view a split second in the earth’s history, indelibly frozen in sand by this fused silica called fulgurite. A moment when lightning came down from the sky and hit a Florida beach, and left a mark that allows us to see its footprint. This is how big a lightning bolt is, or at least this particular lightning bolt.



With appreciation to Christopher Johnston for sharing his excellent photographs. Please visit his website to see more of his work: <http://www.chrisjohnstonphoto.com/>

All lightning photographs ©2011 Chris Johnston Photography

Fulgurite images ©2011 World Gem Society

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International School of Gemology | info@worldgemsociety.org | San Antonio, TX 78230

Popular Mineralogy

Fascinating mineralogy and earth science for the amateur mineralogist and serious collector - #42

Seeing Inside Minerals

by Andrew A. Sicree

Discovering X-rays

All mineral collectors know about X-rays and most of us have heard that they are useful in identifying minerals. But the details are a bit sketchy. What are X-rays? And how do they help us identify minerals?

Wilhelm Roentgen is usually credited with the discovery of X-rays for his work in 1895. Although the claim that Roentgen was the first discoverer of X-rays is somewhat debatable – there were others who observed the effects of X-rays earlier – certainly Roentgen was the first to extensively study the properties of X-rays. While working in the dark in his lab with a cathode-ray tube, Roentgen noticed that a nearby screen covered with barium platinocyanide (doesn't everyone have one of these in his lab?) was glowing or fluorescing, even though it was well beyond the range of any electrons from his cathode-ray tube.

Experimenting further, Roentgen decided that he had discovered a new and different form of radiation, which he labeled X-radiation, signifying its unknown nature. He determined that X-rays could penetrate opaque matter, passing through paper, wood, skin, and even thin sheets of metal. This led to the famous photograph he took of a woman's hand – which clearly shows the bones of the hand and even a ring on one of the fingers, but only a shadow of the skin and muscles: the first medical X-ray image. Roentgen's X-rays were a fantastic boon to medicine enabling doctors to “see” broken bones inside their patients. In some countries, X-rays are called “Roentgen rays” in his honor.

Making X-rays

X-rays are generated when a high-energy beam of electrons (usually inside of an evacuated tube) hits a target (usually a metal such as copper). Electrons belonging to atoms in the target are knocked out of their orbits by the electron beam, and when they return to their original orbits, the atoms release energy, usually in the form of x-rays.

X-rays are, quite simply, a form of “invisible” light, which is to say that they behave like visible light. Like visible light, X-rays have wave-like behavior and thus one can measure their wavelengths. The difference between x-rays and visible light can be found in their wavelengths. Visible light wavelengths fall in the range of about 700 to 400 nm (nanometers, equal to one billionth of a meter). Below 400 nm is the ultraviolet (UV) region. Shortwave UV lamps favored by mineral collectors put out light of about 253 nm. X-rays are much shorter than UV, having wavelengths in the 10 to 0.01 nm range. In other words X-ray waves are about one-hundredth to one-hundred-thousandth the “size” of visible light.

Identification of minerals

It is precisely these short wavelengths that make X-rays useful in mineralogy. All minerals are crystalline (even if they don't display good crystal faces) which means that their atoms are arranged in regular, repeating arrays. The wavelengths of X-rays are similar to the distances between atoms in a crystal. This allows X-rays to penetrate crystals. But as X-rays pass through a crystal, some of the X-rays are bent or “diffracted” by the atoms in the crystal. These X-rays will exit the crystal in a different direction than the incoming X-rays. These diffracted X-rays produce a pattern dependent upon

the mineral's crystal structure. Because each mineral species has a different arrangement of atoms in its crystals, each mineral will produce a different X-ray pattern. Patterns for most minerals and a great number of synthetic crystals have been determined and published in libraries of X-ray patterns. Thus, the X-ray pattern of an unknown substance can be compared with and matched to a specific mineral, yielding the unknown's identity. This only works, of course, if the unknown in question is a previously discovered mineral.

If your unknown is a new mineral, the X-ray pattern is still extremely useful because it gives information about the crystal system, the size and structure of the crystal's unit cell, and other useful parameters. The X-ray pattern is an important part of the description of a new mineral species.

Access to X-ray apparatus

Costly X-ray diffraction equipment is well beyond the wallets of most collectors. An assortment of X-ray apparatus finds use by professional mineralogists. Some units analyze single crystals – a small (approximately 1-2 mm) crystal may be all that is needed. Single crystal diffractometers are particularly useful when studying crystals of newly discovered mineral species, but few labs have these machines. For identification of known minerals, powder X-ray diffraction is quicker and cheaper. Here a pea-sized grain of a mineral must be crushed to a powder (thus you have to be willing to sacrifice some of your specimen). This powder is then hit with X-rays to produce a “powder diffraction pattern” which can be compared with libraries or databases of patterns for all known minerals.

Unfortunately, X-ray equipment is very expensive to buy and to maintain, so it isn't something you'll find in the average rockhound's toolkit. But prices are dropping somewhat. The least expensive machines are the new “desktop” powder X-ray diffraction equipment that recently hit the market – they start at about US\$50,000. To operate X-ray-generating equipment, you must be trained and licensed by the state.

One alternative to owning and operating your own X-ray equipment is to ship your unknown samples to a commercial analytical lab. They'll do the X-ray work for you for a price. Fees usually range from about US\$100 to US\$200 per sample depending upon the amount of sample prep needed and whether or not you want a full-fledged report written or only the raw data returned.

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The Rarest of Minerals

More than 4400 mineral species are found in nature. Some mineral collectors are species collectors who try to build a collection with as many of these species as possible. It is safe to say that no one has ever collected every known mineral, nor does any museum have a complete collection. New species are found and described each year and many mineral species are quite rare. Many of these species are known only from a few “spots on rocks” at their discovery site – usually referred to as the “type locality”.

What is the rarest mineral of all? Many candidates could be submitted for this honor. For some rare species, rarity is really a function of the inaccessibility of the collecting site. Tranquillityite, from the Mare Tranquillitatis (Sea of Tranquillity) on the Moon is undoubtedly one of the rarest of all minerals. It is a dark red-brown hexagonal mineral with the interesting formula $(\text{Fe}^{2+}, \text{Ca})_8(\text{Zr}, \text{Y})_2\text{Ti}_3(\text{SiO}_4)_3\text{O}_4$, but it is its origin more than the structure that makes it rare. Apollo astronauts collected it and it is unlikely that any additional samples will be collected soon. Whether or not it is truly rare on the Moon is a separate question – for all we know the Moon could be crawling with the stuff.

Another extreme rarity is ernstburkeite, a trigonal magnesium methane sulfonate hydrate, $\text{Mg}(\text{CH}_3\text{SO}_3)_2 \cdot 12\text{H}_2\text{O}$. Although this compound is known synthetically (i.e., it can be made in a lab), it has only been found in nature in Antarctica. It was found as a small (0.005 mm) inclusion in an ice core taken from a depth of 577 m below the Dome Fuji Base on the East Dronning Maud Plateau in

East Antarctica. Not exactly the site of your next field trip!

It is interesting to note that rarity does not always create value. You may have the world's largest specimen of "whatchamaycallitite" a 1 mm-long beauty of a species which is known from only five almost microscopic crystals found in one locality (which just happens to be in your backyard). But chances are good that you won't be able to sell that specimen for anywhere near the price of a modest 1-cm rhodochrosite from the Sweet Home Mine, Colorado.

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*Dr. Andrew A. Sicree is a professional mineralogist and geochemist residing in Boalsburg, PA. This **Popular Mineralogy** newsletter supplement may not be copied in part or full without express permission of Andrew Sicree. **Popular Mineralogy** newsletter supplements are available on a subscription basis to help mineral clubs produce better newsletters. Write to Andrew A. Sicree, Ph.D., P. O. Box 10664, State College PA 16805, or call (814) 867-6263 or email sicree@verizon.net for more info.*

Inter-Galactic Diamonds

Diamonds may be a girl's best friend, but would your fiancée accept a black diamond in her engagement ring? We are not talking about clear black like a nice faceted smoky quartz, either. Would she want a diamond that was black, opaque, and looked like intergalactic space grunge?

Not all diamonds are transparent and many that come out of the diamond mines are less gemmy than those you see in the jeweler's shop. These lower quality diamonds are sold as abrasives, but most mines make the bulk of their profits from the gemstone diamonds they produce. However, in Brazil and the Central African Republic, there are diamond-mining operations that only produce black diamonds known as carbonados.

Carbonado is a variety of diamond that is black or dark gray. Carbonados are adamantine in luster (i.e., they are shiny) and opaque. Unlike most diamonds, they are not single crystals, but rather are polycrystalline, composed of many small crystals. Their polycrystalline nature makes them more porous than other diamonds and also tougher. Toughness is resistance to breakage unlike hardness, which is resistance to scratching (carbonados are about the same hardness – 10 on the Mohs scale – as all other diamonds).

Carbonados can and have been cut as gemstones, in spite of their lack of transparency – but they do not take a polish as good as more normal diamonds.

Carbonados come from sedimentary deposits in Brazil and the Central African Republic, on opposite sides of the Atlantic Ocean. They are not associated with normal diamonds nor are they found with kimberlite, the host rock of most diamonds. Geologists are uncertain of the origin of carbonados. Some researchers contend that these stones originated in outer space and fell to Earth as a giant meteoroid about 2.3 billion years ago at a time when Africa and South America were joined in a single supercontinent.

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Mine Shaft Humor

Question: What do you call 57 politicians at the bottom of an old abandoned mine shaft?

Answer: A good start!

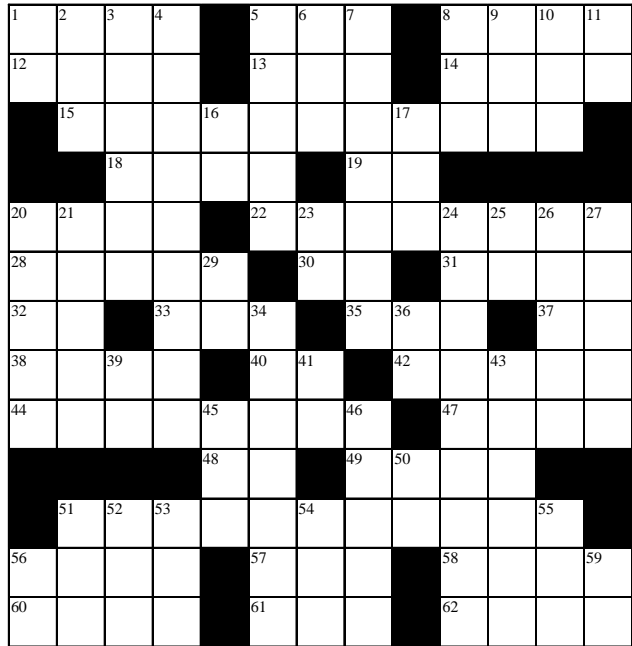
Se and Sn

ACROSS

- 1 a flat rock
 5 pass in the mountains
 8 California pegmatite mine
 12 ecclesiastical (ab)
 13 ___ tree that yields caucho
 14 found in goethite, magnetite, etc.
 15 overhanging carbonate formation
 18 Russian religious art, often with Au
 19 found in smithsonite
 20 what some Malays do
 22 oxygen, peroxide, etc.
 28 found on my knee
 30 meaning “and” in Latin
 31 Scarlet friend
 32 and others (ab)
 35 long ___ in the Precambrian
 37 ___ be or not ___ be
 38 animal unchanged by millions of years
 40 the (Span. fem. sing.)
 41 of great price; a gem but not a stone
 44 NiTeSe
 47 basketball monopolists
 48 mikes and projectors
 49 ___ Mesozoic, last dinos
 51 tin oxide
 56 glacially-formed hill
 57 computer maker
 58 due to the moon and sun
 60 chunk of metal
 61 exterior (ab)
 62 found in the Grand Canyon

DOWN

- 1 not found in selenite
 2 landing craft (pl.)
 3 taking ____
 4 miner’s term for ZnS
 5 phosphate deposit
 6 alcohol (ab)
 7 silver and gold telluride
 8 a mine
 9 Car 54, Where ___ You?
 10 he (pl.)
 11 andesite (ab.)



- 16 not hi
 17 state west of Ohio
 20 taken ____
 21 natives of New Zealand
 23 rare noble gas
 24 silver sulfide
 25 New Hampshire
 26 four
 27 woman’s cloak
 29 Officer of the Guard (ab)
 34 a green mineral
 36 recipe (ab)
 39 Old Testament (init)
 41 where it’s ___
 43 acid in vinegar
 45 puzzle creator (init)
 46 how we get club officers
 50 argon
 51 Cornwall miners term for wolframite
 52 atomic mass unit
 53 Society of Economic Geologists (ab)
 54 oil-state state
 55 Old English letter
 56 Kansas
 59 means “dawn” – early in geological time

January

2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 Extreme Beaders 9a-5p	4 Gemcraft 6:30p	5 Gemcraft 12-4p	6	7
8	9	10 Extreme Beaders 9a-5p Faceteers 6:30p	11 Gemcraft 6:30p	12 Gemcraft 12-4p	13	14
15	16	17 Extreme Beaders 9a-5p	18 Club Mtg 7:00p	19 Gemcraft 12-4p	20	21 Cuff Bracelet 10a
22 Juniors 12-2p	23 Rocky Reader Deadline	24 Extreme Beaders 9a-5p	25 Gemcraft 6:30p	26 Gemcraft 12-4p	27	28
29	30	31 Extreme Beaders 9a-5p				

Group meetings and classes are for members only. Our club meetings are open to the public on the third Wednesday of every month. To learn more about our club, visit us during our Open House held every May and November.



**Rocky Reader Editor
Suzanne Shmatzki
107 Florentine Dr
Holland, OH 43528**

