GOLDRUSH LEDGER

CHARLOTTE GEM & MINERAL CLUB

FEBRUARY 2013

Prez Sez …

So here we are, firmly ensconced in 2013. I was really sorry to have missed the first general meeting and presentation of this new year. It turns out that my assumed retirement from the field of pharmaceutical market research was a bit premature. Starting in early January I have had clients from years ago contacting me with requests for my services. I always keep an eye on the calendar in an attempt to avoid CG&MC scheduling conflicts, but often that decision is not mine to make.

While many of you were enjoying Danny Jones's presentation on the exotic mineral specimens of Morocco, I was slogging my way through airport security in Atlanta in an effort to catch an evening flight to Philadelphia. I've been flying on business for well over twenty years and take it from someone who knows - flying today ain't no picnic. To add to the excitement, I have clients who make brilliant decisions such as working in Atlanta with a temperature of 70 degrees then going on to Philadelphia with a temperature of 35 degrees.

I want to take this opportunity to thank the club officers who took over the January meeting in my absence. I've been told that our new vice president, Lindsey Werden, stepped in seamlessly and ran the meeting like a pro. Considering the fact that he was president of this organization some years back, that's not surprising.

Speaking of meetings, we have a very important one coming up this month. Those of you who were fortunate to have attended our now famous "presentation under the stars" last October will remember the dynamic lecture by Dr. Sarah Carmichael from the faculty at Appalachian State University. At the conclusion of her talk she told me that one of her colleagues at ASU would be a great speaker for our club.

Thus the wheels were set in motion 5 months ago to bring Dr. Steven J. Hageman to Charlotte for that talk on Thursday evening, February 21, and this is one you will not want to miss!!! His presentation will focus

Table of Contents

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on a subject we haven't explored before – the biomineralization of fossils – the process by which they form and are preserved and the minerals that are involved.

Most of us who collect specimens have fossils within our collections; now you have the opportunity to discover how they came to be. I have a suspicion we'll be seeing some unique and impressive fossils during this presentation.

And speaking of fossils (note to editor – do not change that to 'speaking as a fossil'), I'll be bringing some fliers to the February meeting that announce an SFMS-sponsored fossil dig at the Durham Mines in the northwest corner of the state of Georgia on March 2. This is a chance to find a wide variety of Paleozoic plant fossils such as Fern and Coal Fossils, giant horsetails and seed ferns.

This type of dig is a bit different from others you may have been on – you won't get as dirty. The fossils are found by splitting the abundant shale at the site with most yielding twigs, bark and ferns. Sounds to me like you'll need gloves, chisels, hammers and safety glasses. If you have any questions about this site or the best way to hunt for fossils, I suggest you talk to our own fossilmeister / vice president Lindsey Worden who is familiar with that area and has been a collector for many years.

Murray Simon
President and Galloping Gadfly of the Charlotte Gem and Mineral Club, Purveyor of Tonics and other Medical Paraphernalia, and Intrepid Traveler Extraordinaire.

Nipomo Marcasite - Nipomo, California
Marcasite shares the same chemistry as pyrite, but has a different crystal structure. The structure is far less stable and marcasite often crumbles and is not as stable as pyrite. Nipomo marcasite is marcasite trapped in chalcedony/agate. The agate tends to stabilize the marcasite and preserves it's fine structure so all can enjoy it for a much longer time. (Marcasite is sometimes called "white pyrite.")

Charlotte Gem & Mineral Club Monthly Meeting

February 21, 2013 Thursday -- 7:00 pm --

Location: Tyvola Senior Center
2225 Tyvola Rd.
Charlotte, NC 28210
(704) 522-6222

Minerals and Minerals in Fossil Preservation

Dr Steven J Hageman
Dept. of Geology
Appalachian State University
Department of Geology
(Co-editor or The Journal of Paleontology)

Besides studying evolutionary micro-paleontology Dr Hageman has written a very interesting paper entitled :

How Small of a World is it, After all?

It's fun and quite worthy of a read, it can be found at this URL -

http://www.appstate.edu/~hagemansj/smallworld.html

Charlotte Jr. Rockhounds

Saturday February 23, 2012

10-11:00 a.m.

Due to ~~rainout snowout~~ bad weather … the January meeting had to be cancelled. So it has been rescheduled for this month.

Topic: Fossils and the Timeline of the Earth
by Neil Hohmann

Location: Matthews Community Center
100 McDowell St. East
Matthews, NC 28105
704-321-7275

Contact: Mary Fisher
for further information
at: mefisher@att.net

Diamonds were forever?
(Largest diamond find ever!) *by ron gibbs*

Diamonds, perhaps better known as crystallized carbon, may be more common than most people are lead to believe. Lets look at some numbers and then report some relatively new information.

Carbon is the forth most abundant element in the Milkyway galaxy. It follows after hydrogen, helium and oxygen, and is the first solid element at earth standard pressure and temperature. It is four times more abundant than iron, next on the list of solids.

Since heavy elements are associated with the growth and death of stars, it is useful to look for a moment why carbon and iron are the most prevalent solid materials.

Stars use hydrogen and helium as the starting fuel in nuclear fusion. As some stars age the become red giants and begin to cool. During this process they fuse multiple helium nuclei to form carbon and oxygen. As this process dies the outer shell of the star is shed and the center falls back to form a white dwarf.

Some larger and hotter stars follow a similar path, but have more energy and heat available, and go through far more fusion processes. Eventually if the star is large enough it will produce materials up to the atomic weight of iron. At this point the core begins to fill with the accumulated iron and the energy is expended.

Thus carbon and iron become the main products when two types of stars finally die. Hence these are the abundant elements throughout the Milkyway.

An interesting physical property of carbon is that it does not melt to form a liquid. Carbon, at 3642 ºC (6588 ºF) sublimes and changes from a solid to a gas. (This assumes the absence of O_2.) Carbon will burn in O_2 to from carbon dioxide.

There are basically three forms of carbon; graphite, diamond, and amorphous. Because it does not melt and is effectively insoluble in common solvents, it cannot be melted or dissolved and then "recrystallized" to form its crystalline state. Thus we cannot easily convert graphite to diamond via crystallization.

The change from non-crystalline carbon to diamond (crystalline carbon) regquires both the correct temperature and pressure. If the temperature is too high (even with sufficient pressure) the carbon wil not convert. Hence a specific zone is required.

Diamond reaches the proper pressure between about 90 and 120 miles below the earths surface. Beneath the ocean the temperature of the earth rises more rapidly than under thick continental plates and hence it is more difficult for diamond to arrive at the correct pressure and temperature combination.

Most diamond appear to form beneath continental plates where temperature rises more gradually. The source of carbon has been shown (for some diamond) to come from the earth's surface. Thus organic carbon is subducted at continental edges and taken to depth. In the upper mantle (less than 90 miles) it is believed that carbon can exist in stable form as carbonate.

Carbonates may be changed at further depth in the presence of reducing iron and be converted to diamond. (this has not been proven but has been theorized.) Many lesser quality gem diamonds have carbon/graphite still trapped within the crystal. Analysis of this material has confirmed some surface sources for the carbon. This has

also been verified by carbon13 and carbon12 ratios.

Most diamonds show an age of at least 1 billion years. As with most crystal growth mechanisms, the slower the process in growing the crystals the larger they become. Hence the more gradual temperature gradient found beneath contentments tends to favor larger diamond crystal sizes.

Kimerberlites may or may not be the nursery material for diamond formation, but they are the conveyance mechanism for bringing them to the earths surface. As it happens kimberlite has a higher than expected content of volatile materials. It somehow manages to maintain higher concentration of water and carbon dioxide than might be expected at the depth it originates. This is likely due to the lack of certain elements in it's composition that would otherwise react with the volatiles.

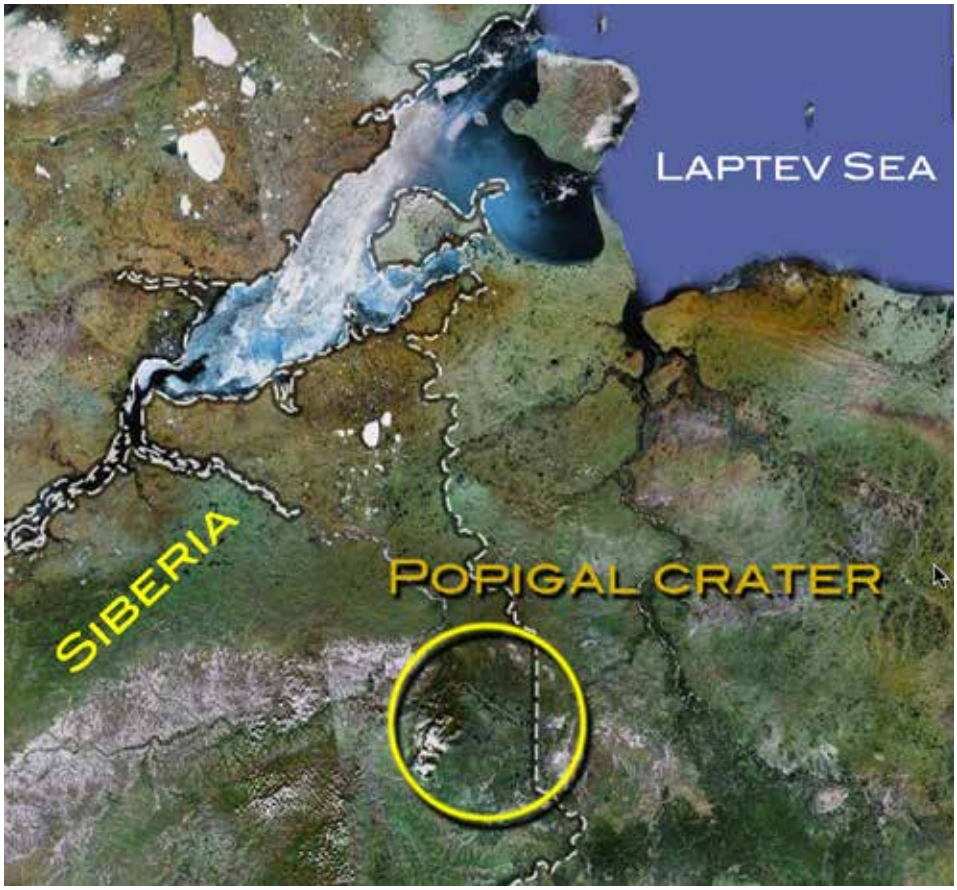
It becomes the conveyance system for both diamond and other garnet peridotites to the earths surface. Neither would survive the trip without the high speed provided by the volatile kimerberlite. It is believed to be the deepest form of igneous rock and forms between 90 and 280 miles of depth. The theory is that the kimberlite pushes through the diamond creation layer and brings the diamonds up as it erupts.

So we have learned that diamonds take precise conditions to form and those conditions are not found on the earths surface. So can we get diamonds any other way? Well, yes, they are also formed under certain conditions of rapid high pressure and temperature on the earth's surface. To be precise, when created under laboratory conditions, or when an astroid or large meteorite strikes the earth.

General Electric produced the first commercial (and repeatable) diamonds in 1954. They developed a mechanical press with high temperature. All of the early diamonds were yellow or brown in color and useful only for industrial applications. Over time they developed methods to create white stones of sufficient size for jewelry use, but at fairly high energy expenditures and cost.

Diamonds have also been created via vapor deposition and by explosive means. The vapor deposition was first successfully used to create diamond coatings on other materials, but has since been used to create jewelry grade and sized stones.

The explosive technique has



been used to create only industrial grade very small stones with high carbon content, but the concept has been proven. This leads us to the late 2012 discovery of diamonds in the upper part of Siberia. There are diamonds being mined at the Yakutia mine in north western Russia.

Last year the Russian's announce the discover of the largest diamond reserve on earth. They are located under and around the Popigal Crater in Siberia. They were apparently discovered as far back as the 1970's but kept a secret. They are "impact diamonds" created when a large astroid hit the surface of the earth over a deposit of graphite.

The astroid was thought to be about 8 km in diameter when it struck. The impact reportedly created a diamond bearing area with a radius of 13.6 km. Most of the stones produced are between 0.5mm and 2mm in diameter and are not of gem quality. According to Russian sources they estimate there are more than 3 trillion carats, or enough to supply the entire industrialized world for about 3,000 years.

Interestingly enough they also claim these "impact" stones are roughly two time (2X) as hard as other diamonds. This has not been verified, but some lab created stones have shown hardness values about 50% harder than natural stones, so it's not impossible.

There are other problems however, today industrial grade diamond sells for about $2 carat on the industrial market. To be successful in mining, you need to produce a fair number of gem quality stones when working up kimberlites which produce about 0.5 to 2 carats per mined ton of material. With no gem grade stones it's going to be difficult to afford the roughly $100 processing price per ton to do the mining. It means the diamonds are going to have to be found in roughly 50 carat per ton quantity to break even.

So the Russian diamond announcement is not likely to have a major effect on world diamond prices any time soon. Especially since none are expected to be of gem quality so they are likely to complete only with industrial grade cutting diamonds.

This reminds me of one other fairly recent observation in the diamond world. "Bort" is the general name given to industrial grade diamonds. Basically these diamonds tend to be black to various shades of brown or even white, but with massive numbers of black or dark carbon inclusions.

So how do you increase the price of bort? Well you put together a slick marketing campaign and change the name from brown (bort) to "chocolate". You create a line of jewelry based on consumer predilection for the luxury name of chocolate.

This follows on the recent market push to sell black diamonds. (No transparency what so ever.) It ups their industrial price from less than $5 a carat to several hundred dollars per carat. Yes sir you can pay a premium for the "black town-car" of diamonds the pure and elegant black. It's all in how it's marketed.

I'm not saying that some of the jewelry produced from these brown and black stones is not beautiful, but just remember these are not going to be classic investor stones. At best they might be like a temporary fad, and have some nostalgic value in later years. They will never become more rare with time.

Diamonds have historically escaped the general "supply and demand" rules. They have been artificially controlled. So use care when buying them, they may or may not be "forever", but only the best will likely maintain value over time.

E-Bay (buyer beware)

by ron gibbs

(*A lot of fun for those who study the clues and don't believe in get-rich quick" buys!)*

I'm an "E-bay-oholic", but a well studied and prepared one. Scams and partial truths are abundant right now in many gem and jewelry transactions on E-Bay.

E-Bay is fun and for those who do some due-diligence it can be rewarding. For those who "jump" on the unbelievable deals, well, they were likely unbelievable for a reason.

I recently purchased a series of cut gemstones on E-Bay and most were somewhat less than accurately described. A choice few were accurate, but only if you know how to read between the lines.

Here is an example of a truthful, but maybe a bit misleading representation. Let's examine it ...

33.67 CT AAA! PAIR! PURPLE & ***GOLDEN BOLIVIA AMETRINE*** BRIOLETTE CUT (DRILLED)

This is the headline at the top of the page describing the item(s) for sale. One might believe that it was ametrine from Bolivia. Further down in the description we find a truthful seller in this case, but unless you read the whole description the truth might be missed.

Here is a cutout from the remainder of the page. Notice the TREATMENT line shows the treatment as "Lab Hydrothermal Condition". This is true, the material is "man-made" and created in the lab using hydrothermal growth techniques. Simply said it's synthetic. The ORIGIN box specifies Bolivia, and that is where the best natural ametrine is mined. I am not aware of any synthetic quartz labs in Bolivia, but there maybe one, so I can't say this is truly misinformation, but it is a bit misleading.

10 DAYS COMBINING	ONE SHIPPING FREE	NO RESTOCKING FEE
Product Description		
Product Name	AMETRINE	Color	PURPLE & GOLDEN
Product ID	AM364395	Clarity	IF
Quantity	2 PC	LUSTER	SUPERB
Shape	BRIOLETTE CUT (DRILLED)	Hardness	7
Weight	33.67 CT.	Treatment	LAB HYDROTHERMAL CONDITION
Size	10.0 X 32.0 - 10.2 X 30.0 mm.	Origin	BOLIVIA

I purchased several pieces of this material, and it is quite beautiful. I'm very happy with it. BUT, I knew going in that it was synthetic and bid accordingly.

So let's examine another stone offered for sale. Here is a nice "green-blue" ametrine ...? Blue-Green? Yes that's what the offer specifies, and here is the banner. Now one might expect at least the same sort of information in the later description. But in this case the treatment slot specifies "UNHEATED".

*24.0CTS. WINSOME ROUND SHAPE GREEN-BLUE COLOR **AMETRINE***

This is probably a truthful statement, as lab grown quartz is not post heated to add or change the color. It is grown with the needed colorant in the tank. Here is part of the description for this one ...

In this case no Origin was specified, and the only TREATMENT was listed as UNHEATED. Again this is likely true as I doubt that the synthetic material was heated after it's formation, but it is never specified as synthetic, hydrothermal, or man-made.

I also purchased a few of these stones and was quite happy with the purchases, but once again I knew what to expect while I was still bidding.

E-Bay is full of these gemstones and today many are hydrothermal (lab-made) quartz. They include citrine, amethyst, and ametrine. So what are the warning signs? Well I'll tell you the ones I look at, but these are not fail-safe.

1.) the stones are **large**, **perfect color**, and typically have the "pineapple" facet pattern on the bottom. *(see example below)*
2.) the beginning bids are very low price-points (less than a few pennies per ct.)
3.) most are offered from sellers originating in Thailand, Hong Kong, China, or elsewhere in Asia.

So are there some "real stones" that follow these same guidelines? Yes, but not that often. The "real" stones of citrine, amethyst and ametrine tend to be far less colorful and much smaller in size.

So how about a quick jewelry example. I recently bid on several large necklaces that were claimed to be "925 silver" and had a wide array of gemstones in the settings. I was very skeptical of the price and stated quality and descriptions. So I bid accordingly and won three of the necklaces.

Here is a typical description of one of the pieces ...

RHODOCHROSITE , RIVER PEARL , PERIDOT .925 SILVER NECKLACE 18"

this is actually one of the necklaces that I ended up winning. It arrived in a reasonable time and I was happy to buy it for about $30. Obviously it supposedly has peridot, rhodochrosite and river pearl in ".925 sterling silver".

It arrived and was nicely packaged. I flipped the necklace over cut through a couple of the links and removed them. I then cut the larger link into two pieces and melted one side in to a sphere.

First, the link was far harder than any sterling silver I have ever worked with. Second, it did not melt like or cool at the rate that would be expected for sterling silver. It stayed hot for much too long. After pickling the resultant "sphere" appeared to be mainly copper with patches of silver. Finally if I used a Foredom tool and grinding wheel I could grind on the remaining 1/2 link and there was nearly zero heat build-up even as I held it with my fingers.

(Sterling would have burned me.)
The necklace is marked as .925

sterling, but it is not.
I also tested the rhodochrosite and it appears to be real. It blackens on flame treatment and has a pattern all the way through the cabs I tested. This is consistent with real rhodochrosite.

The "river pearl" may be real, my tests were not conclusive on it, and it did not give off a characteristic smell of plastic when heated or burned.

The peridot do not display proper optical properties and extinguish entirely under crossed polarizers. Thus they are not doubly refractive. They also show zero inclusions and for stones this size that would be highly unlikely. They appear to be glass.

I ended up winning the necklace for about $30. It's a nice piece of costume jewelry, and if it were as described, it would be worth hundreds of dollars, but it's not. Am I disappointed or unhappy? Not really it was about what I expected.

These necklaces are coming out of India and have all variety of stones. One dealer actually listed it as "plated sterling", but most indicate that they are pure sterling silver. This is false advertising. On one other necklace I purchased the blue topaz was also not as advertised. It was glass.

The dealers offer complete satisfaction if not happy with purchase, and they fear a bad write up more than almost anything. So they can be returned, but for me they were just a couple of tests. Buyer beware!

What is a "pineapple" cut? It an almost random set of diamond shaped facets over the bottom (pavilion) of the stone. The final testure reminds me a bit of a pineapple skin.