Wayne County Gem and Mineral Club News

January, 2016 **Always Looking for Places to Dig!**

Kathleen Cappon's cephalopod appetizers at the Holiday Party
(more pictures on page 7)

Website
http://www.wcgmc.org/

Stromatolites see pg. 5

Garnets galore *(see page 2)*

Next Club Meeting
Friday January 8th, 7:00 PM

Presbyterian Church, Maple Court, Newark, NY

PROGRAM: A review of club activities in 2015.

- A slide show of all our trips, workshops, GemFest, and parties in 2015.
- Have fun recalling what we did and what we collected.
- Bring specimens collected in 2015 to show and share.
- And we'll start thinking about where we want to go when the snow melts in 2016.

Club Workshop, Saturday, Jan. 9th

Bring your rocks to saw and polish. The workshop is open to all paid club members; we do ask for $5/visit from each adult to help maintain equipment. We plan to hold similar workshops once a month through the winter months.

When: 10:00 AM til mid afternoon, Sat. Jan. 9th
Where: The Weiler's Barn and Workshop
6676 E. Port Bay Rd, Wolcott, NY
Rules: BYOR (Bring your own rocks) to saw, grind, polish or even facet. Training on equipment is available. Eye protection is recommended.

WINTER WEATHER: An e-mail note will be sent to members if a Friday meeting must be cancelled. Or call Bill Lesniak (315-483-8061), Fred Haynes (585-203-1733) or Glenn Weiler (315-594-8478)

2015 Ends with a Big Party

The WCGMC Holiday Party was attended by 45 club members on a balmy Friday evening in December. After gorging on roast beef, ham, a cephalopod appetizer, a potpourri of salads and vegetable dishes, and more desserts than one table could hold, the group was entertained by live music from Kathleen Cappon. Linda Schmidtgall then led us through an exercise with darts, balloons and playing cards to help us work off some of the calories. Everyone left with a mineral prize they won with that activity. If you missed it, mark your calendar for the second Friday in December, 2016.

The following day it was a smaller crowd of 16 eager lapidary enthusiasts that showed up at the workshop to cut and polish stones and eat party leftovers. Another geode was raffled off, with Don Craig and Eva Jane Weiler each winning one half of a 6" quartz geode.

go to page 7 for more on both December events.

almandine

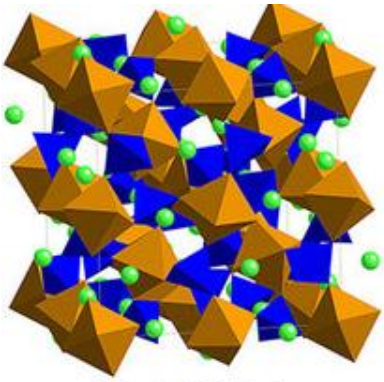
JANUARY BIRTHSTONE

Garnet by Fred Haynes

hessonite 

Garnets are hard (Moh's hardness of 6.5-7.5), or as hard or harder than quartz. As members of the isometric crystal system garnets are symmetric with three equal and perpendicular axes. Garnets are colorful: red, yellow, green and many shades of each. **And garnet is the birthstone for all born in January.**

Structurally, garnets are simpler than other silicate mineral groups like amphiboles or tourmalines.



$A_3B_2(SiO_4)_3$

A: dodecahedral sites (green)
B: octahedral sites (blue)
SiO_4: silica tetrahedrons (brown)

Garnets are nesosilicates which means that the silica tetrahedrons upon which all silicate minerals are built are isolated and only connected by elements occupying interstitial locations in the mineral lattice. In the case of the January birthstone, there are actually two interstitial locations, a large octahedral site and a smaller dodecahedral site.

Although a member of the isometric (or cubic) crystal class, garnets typically display dodecahedral form, the simplest of which has 12 surfaces, each a pentagon with five equal sides. There are several variations and rhombic dodecahedrons are the most common in the garnet family. And to be complete we should mention trapezohedral habit, where the surfaces are "kites". In geometry, kites are quadrilaterals with two pairs of equal length sides that are adjacent to each other. You know, like a kite!

Chemically, most garnets come from one of two solid solution series. Pyralspite garnets have aluminum in the octahedral (B) site. With iron in the dodecahedral site, the mineral is ***almandine***, with magnesium in that site the mineral is ***pyrope***. When the site is occupied by a significant amount of both Fe and Mg the mineral or gem will often be called ***rhodolite***.

Spessartine has manganese in the interstitial B lattice position and is typically orange. However, brilliantly red-violet spessartines are found in Colorado and Maine.

The ugrandite series of garnets are characterized by calcium in the dodecahedral (A) site. With iron in the B site, the mineral is ***andradite***. The mineral ***grossular*** has aluminum in that site. Solid solutions of the two are refered to as ***grandites***.

There are also variations of ugrandites based on color. Although not recognized mineral names, bright green andradite is termed ***demantoid*** and black andradite is referred to as ***melanite***. Cinnamon brown grossular like that on the Canadian stamp in the header is called ***hessonite***. Grossular garnets from parts of Africa are called ***tsavorite***. When chrome occupies the B spot, the result is dark green ***uvarovite.*** As garnets, all can be gemmy.

Garnets are very common and form in a multitude of geologic environments. Perhaps the best known are those found as large grains in metamorphic rocks such as schist and gneiss. These are known as *porphyroblasts* if they grew in place during deep burial metamorphism.

Another environment where garnets grow large is when magma intrudes limestone. Silica-rich fluids from the magma react with the limestone to form silicate minerals. Grossular-andradite garnets are found at the Lewis Wollastonite Mine in the eastern Adirondacks Andradite is a common mineral in the skarn assemblage at the Marmora Quarry east of Toronto.

The large almandine garnets at Gore Mountain are examples of high grade metamorphic garnets.

The garnets wishing you a Happy New Year on the front page are all almandines from the club collection. The larger ones spelling NEW are interesting. They are star garnets from India.

The internal stars originate from tiny rods of rutile arranged along crystal planes. When the garnets are cut into cabochons or spheres the rutiles reflect light from the partially opaque interior of the stone. Star almandines are also found in Idaho, but are generally quite rare elsewhere.

The club has a lot of raw star garnets that look like the one on the left. Come to a workshop and see if you can turn one into the stone on the right!

THE HISTORY OF BIRTHSTONES

Man has been attracted to the color, morphology, and splendor of natural or cut gems as far back as recorded history can reveal. There is evidence that as early as the first century connections had been made between certain gems and the twelve signs of the zodiac. Throughout the first millenium, and well into the second, the practice was to own twelve stones and wear or display one during each zodiac period. It was not until the 18th century that gem traders in Poland concocted the idea of associating own's birth month with a specific stone or gem. Driven by commercial interests, the concept of a birthstone was born.

However, the idea was not well defined or practiced until the National Association of Jewelers met in Kansas in 1912 and announced the modern list of birthstones. Amazingly the list they proposed at that time has survived for over 100 years with very little change. Alexandrite and citrine have been added to June and November respectively, and zircon replaced lapis in December, but most month's assignments have survived the passage of time. Twice in the past 15 years (2002 and again in 2006) gem traders have attempted to add tanzanite a birthstone, first for December and later for all births, but the suggestion has not been universally accepted.

WCGMC has decided to make 2016 the year of the birthstone. Each month the birthstone for that month will be featured in the newsletter, both as a gemstone and as a mineral specimen. New York locations for the gem or mineral will be duly noted. Perhaps we can plan some trips to collect a few of them. However, we are not planning a trip to collect garnet in January!

WCGMC Member January Birthdays

Laurie Frey
Jordan High
Bill Lesniak
Tammy Mayer
Rocky Rowe
Ed Smith
Mary Wilson

References:

Garnet: Great Balls of Fire, 2008, Lithographie, LLC, 98 p.

Lauf, R. J., 2012, Collector's Guide to the Garnet Group, Schiffer Earth Science Monographs Vol. 12, 93 p.

http://www.323gallery.org/StarGarnets.html

http://www.gemselect.com/gem-info/garnet/garnet-info.php

https://en.wikipedia.org/wiki/Garnet

Editor Note: I have meant to research the various colors of gold for some time. Turns out it has been done for me! The following is reprinted with permission from the December 2015 issue of Rockhounds Ramblings, the newsletter of the Pasadena Lapidary Society.

GOLD: Colors and Karats

By Mark Nelson

Pure gold is slightly reddish yellow in color. At a Mohs Scale rating of just 2.5, the same as a fingernail, it is impractical to use pure gold in any way that involves handling.

The U.S. $20 gold piece, so widely circulated, was made from 90% gold (0.900 fine = 21.6 karat) and 10% copper alloy to slow down the wearing process

Pure 100% gold is 24 karat (abbreviated as kt or as K) by definition, so all colored golds are less than this, with the common being 18K (75%), 14K (58%), and 9K (38%). Colored gold is made in three ways. The oldest is by adding another metal to pure gold to form an alloy. The alloys used for colored gold are:

White gold - usually nickel, manganese or palladium. Like yellow gold, the purity of white gold is given in karats

White Gold Red Gold

Red Gold: Gold is made to form a shade of red by adding copper and sometimes silver. Here are the most common mixtures used to make Rose, Red, and Pink gold - 18K Red gold: 75% gold, 25% copper, 18K Rose gold: 75% gold, 22.25% copper, 2.75% silver, 18K Pink gold: 75% gold, 20% copper, 5% silver, 12K Red gold: 50% gold and 50% copper.

Spangold – an alloy of 76% gold, 19% copper, and 5% aluminum. The result is a sparkly surface with tiny facets. Depicted is a tension bangle of spangold.

Green gold was known to the Lydians, near present-day Turkey, in 860 BC under the name electrum, a naturally-occurring alloy of silver and gold. Today we add cadmium to produce the green color by an alloy of 75% gold, 23% copper, and 2% cadmium yielding light-green 18-karat gold. The alloy of 75% gold, 15% silver, 6% copper, and 4% cadmium yields a dark-green alloy.

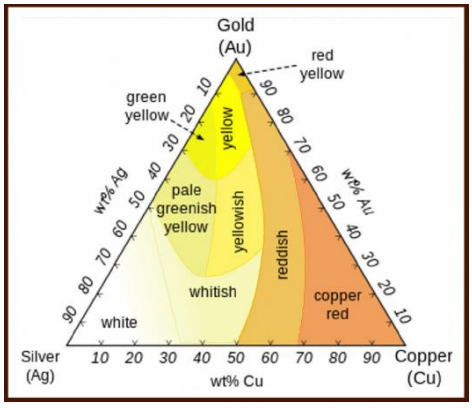
Peridot set in green gold and purple gold with diamond.

Purple gold is an alloy of gold and aluminum which deploys gold-aluminum intermetallic ($AuAl_2$). It is called an intermetallic compound instead of a malleable alloy, as the compound structure becomes somewhat brittle and can be shattered with a sharp blow.

Blue gold is an intermetallic alloy of gold and indium, containing 46% gold (about 12 karat) and 54% indium. Blue gold is also formed through an exterior layer of controlled oxidation of an alloy of 75% gold, 24.4% iron, and 0.6% nickel which is then heated. A rich sapphire blue colored gold of 20–23K can also be obtained by alloying with ruthenium, rhodium and three other elements and heat-treating at 1800 ℃, to form the 3 - 6 micrometers thick colored surface oxide layer.

Blue Gold and Sapphire **Black Gold with diamond**

Black gold is formed by an application of a surface treatment to gold. Black-colored gold can be produced by **Electroplating** using black rhodium or ruthenium, by **Patination** applying sulfur and oxygen-containing compounds, by a **Plasma-assisted** chemical vapor deposition process involving amorphous carbon, and through the process of **Controlled Oxidation** of gold containing chromium or cobalt (e.g. 75% gold, 25% cobalt).



SITE OF THE MONTH

Ace of Diamonds by Fred Haynes

OK. Admit it, you thought this would be a note about the spectacular doubly terminated clear quartz crystals hiding in vugs in dolostones. Referred to as Herkimer diamonds, and known to mineral enthusiasts from across the country simply as "Herks" there has sure been enough written about them to last a lifetime. And goodness knows we all like to travel to Herkimer County to collect them. But no, this is not just another article about quartz.

Stromatolites are bio-chemically supported structures formed in shallow water when microscopic cyanobacterial material (formally known as blue-green algae) acts to bind and eventually cement sedimentary grains into what are essentially microbial mats. Changing climatic conditions, water depth, sediment influx, or the biology of the micro-organisms themselves leads to finely layered biochemical accretionary structures.

The mounds can be fascinating both in their appearance and in the earth history they tell. However, it is probably a mistake to consider a stromatolite as a fossil or even an organism; geologists prefer to refer to them as sedimentary structures or features. Nevertheless they do owe their existence to bacterial life.

As it turns out the very same Cambrian Little Falls dolostone of the Beekmantown Group that hosts "Herks" also contains some rather spectacular stromatolite structures. You may have seen them when as you searched the boulders and outcrop at the Ace of Diamonds mine for vugs that might contain Herkimers. You might have wondered what they were. But most will dismiss them as perhaps interesting, but generally uncollectible, falling within the general category of "leaverite", or leave her right here.

In their "raw" form, the Little Falls Cambrian stromatolites can be great garden rocks. This one has a special place in my vegetable garden.

But they can also be polished to expose the layering. I wonder what a carefully oriented stromatolite sphere might look like. Perhaps I will find out one of these days with the club sphere machines.

Geologically, and biologically, stromatolites are an incredibly important part of the rock record. They provide some of the oldest known evidence of prehistoric life. Stromatolites have been found in rocks older than 3 billion years in South Africa, Western Australia, and elsewhere (Schopf, J. W., et. al, 2007) providing proof of life on earth dating to almost 3.4 billion years.

The mounded sedimentary features became ubiquitous within nearshore rocks in the Proterozoic Eon from 2500 to 542 million years ago, peaking in abundance about 1250 million years ago. The gradual decrease in stromatolites in the geologic record is thought to reflect the appearance and subsequent proliferation of grazing organisms capable of sustaining themselves on the slimy cyanobacteria and thereby limiting its preservation in the geologic record. Nevertheless the biologically based mounds do continue throughout the rock record.

Other occurrences in New York include a Precambrian site just outside the Balmat Zinc Mine. The stromatolites at this location must predate the 1.1 billion year old Grenville orogeny that metamorphosed the region.

A single stromatolite mound from outside Balmat Zinc Mine: Interestingly, the fine layers in the stromatolites from this location indicate that the section there has been completely overturned during the Grenville orogenic event (Bill DeLorraine, pers. comm.).

Another famous New York occurrence is in the Late Cambrian Hoyt limestone in Saratoga County, in particularly spectacular outcrops in Lester Park in Saratoga Springs (Friedman, 2000).

The spectacular cabbage shaped stromatolites in Saratoga County, NY were some of the first to be described and recognized as having a biologic origin. Hall (1847) considered them "remains of sea plants".

Although collecting is not permitted at the Balmat and Saratoga sites, there are stromatolites in the Silurian Lockport dolostone exposed in Walworth, Penfield, and Lockport quarries, other sites where our eyes are typically averted to vugs and hidden crystals rather than to fossils or rock features.

Next time you collect in your favorite Lockport Formation Quarry, you might look for one of these. This is the cross section of a stromatolite from Lockport Quarry.

There are few occurrences of stromatolites in the world today. In fact the first documented occurrence was not discovered until 1956 in a remote bay in Western Australia (Webb, 2002). The extremely high salt content in this lagoon is too high for grazing organisms to thrive and the biogenic slime is able to build into the layered mounds that were much more prevalent in prehistoric time. They have since been found in isolated protected saline bays in marine settings in the Bahamas and in Antarctica, in land-locked pools in the Seychelles reef and even in hot spring environments like Yellowstone, all places hostile to grazing life forms.

Modern stromatolite mounds in Shark Bay, western Australia.

Maybe next time you venture into Herkimer County for "diamonds" you will take a minute to collect a stromatolite or two. Maybe on April 1, when WCGMC makes its annual opening day trek to Ace of Diamonds Mine, you will join me in collecting some. They won't sparkle, and they probably won't make it as a jewelry piece or into a mineral specimen cabinet. But they are a unique geologic entity, they do record a part of geologic history, and if you are creative with your cutting and polishing they can sculpted into an attractive cabochon or paperweight piece. And not everyone that goes to Herkimer County comes home with one!

References:

Friedman, G, M., 2000, Late Cambrian Cabbage-head Stromatolites from Saratoga Springs, New York, Carbonates and Evaporites, v. 15, p. 37-48

Hall, J., 1847, Paleontology of New York State, 8 volumes

Schopf, W. J., et. al., 2007, Evidence of Archean Life: Stromatolites and microfossils, Precambrian Research, vol. 158, p. 141-155.

Webb, R., 2002, Stromatolites – The longest living organisms on the Earth, Coastal and Marine Ecology Articles,

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Grandpa was all excited. His son had finally decided to allow him to take his 8 year old grandson mineral collecting. Imagine his excitement when he arrived to pick up Mikey and the lad was already up and had even made him a cup of coffee.

Smiling, grandpa managed to choke down what had to be the worst cup of coffee he had ever had. When he finished he found three green Army men at the bottom of the cup. Puzzled, he asked his grandson, "Mikey, what are these Army men doing in my coffee?"

His grandson answered, "Just like it says on TV, grandpa, the best part of waking up is soldiers in your cup."

Albany Mineral Show
Capital District Mineral Club

Feb. 13-14 10AM-5PM

New York State Museum
Empire Plaza
222 Madison Ave. , Albany

WCGMC concludes a busy 2015 season with two events

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Club meets 2nd Friday of each month starting in Sept.
Social meeting at 6:30 PM.
Regular meeting at 7:00 PM
Park Presbyterian Church, Maple Court, Newark, NY
Website – http://www.wcgmc.org/

Dues are only $15 individual or $20 family for a full season of fun. Send to:
WCGMC, P. O. Box 4, Newark, NY 14513

The Public is always welcome!
First Class: Date, Meetings & Time Valued

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