

### Club Meetings:

**Third Tuesday of The Month. In A Socially Distanced Format and The Wearing of Appropriate Face Coverings and Bring Your Own Chair**

**Place:  
Arden Community Hall  
636 Hall Rd  
Arden, WA**



## **The Panorama Prospector**

May 2021

### **PANORAMA GEM AND MINERAL CLUB**

#### **April 20, 2021 Meeting Minutes**

*By Audrey Rickard*

**Attendance:** 17 Members

Sheila Stratton started the meeting off with a welcome.

Reminders of opportunities for members at meetings: our library is open for meetings, there is a silent auction for fund raising, refreshment schedule, hats for purchase, and we can bring rocks for identification.

**Treasurer's Report was given by Frank Stratton.**

**A reminder was given by Joe Barreca that yearly membership fees (\$20 check payable to Panorama Gem and Mineral Club) are due annually in November. If you receive your next newsletter in an envelope with a yellow mark on it, this indicates that your membership is overdue and it may be your last newsletter until dues are paid.**

PGMC needs a new trustee and a new secretary. Audrey Rickard has volunteered to act as secretary for the immediate future. Please consider serving in these positions.

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### **Turquoise, Chrysocolla, Malachite, Azurite – Which is it?**

*By Jim Retzer*

When digging through old copper mine tailing piles the question always comes up as to what the blue-green rock someone found is. Is it Turquoise or is it Chrysocolla or possible Malachite? You know its not Azurite because its more of a blue green not dark blue. The biggest debate is between Turquoise and Chrysocolla and how do you know which it is when you are in the field. Well, I hope to confuse you a little more with this article. This is but a small look into some secondary copper minerals to whet your appetite and maybe get you looking further into these minerals.

Turquoise, Chrysocolla, Malachite, and Azurite are secondary minerals of copper. They form when copper minerals are changed by other chemicals. This usually happens when water containing carbon dioxide seeps through copper ores leaching the various chemicals from it and its surrounding rock until it gathers in cracks and fissures and hardens. I know this is a very simplified description of the process, but I did not want to make this a study in Geochemistry (I had enough trouble with that in college).

#### **Turquoise**

The main mineral most people think of when secondary copper minerals are talked about is Turquoise -  $\text{CuAl}_6(\text{PO}_4)_4(\text{OH})_8 \cdot 4\text{H}_2\text{O}$ . In its pure form it has a hardness of 6 on the Mohs scale. This form of Turquoise is scarce. Most turquoise is a cryptocrystalline aggregate that forms in a dense

compact to a porous chalky form. Dense compact forms can have a hardness approaching 6 whereas the chalky form can have a hardness as low as 1.

Turquoise forms as a secondary mineral in areas with significant copper and phosphate content. It is commonly found filling small cracks and voids in the surrounding rock but can also occur as botryoidal aggregation in spaces of mud-filled zones. Other secondary minerals such as Limonite and secondary silica commonly occur mixed with the Turquoise. This can show as a matrix or a precipitate within the cryptocrystalline aggregate mix.

Turquoise can vary from light blue to light green similar to Variscite. Turquoise and Variscite sometimes occur together in some deposits. Because of the green tones of variscite, it can sometimes be difficult to differentiate the two. The green tone in turquoise is caused by small amounts of iron substituting for aluminum in the turquoise structure. The color of turquoise can also be altered by small amounts of iron or zinc substituting for copper in the turquoise structure.

The matrix sometimes seen in turquoise is caused by inclusions of the host rock the turquoise forms in. This may appear as black or brown spider-webbing (as seen in Kingman Turquoise) or larger patches (as seen in Bisbee Turquoise) within the material.

Turquoise is not often confused with Malachite or Azurite, but these two copper carbonates can sometimes take similar forms to turquoise. The most confusion is seen between Turquoise and Chrysocolla.

## **Chrysocolla**

The majority of secondary copper minerals found is Chrysocolla ( $\text{Cu}_{2-x}\text{Al}_x\text{H}_{2-x}\text{Si}_2\text{O}_5(\text{OH})_4n \cdot n\text{H}_2\text{O}$ ). It is a hydrous copper silicate. The chemical formula for Chrysocolla is not clearly defined as it contains a varying substitution of elements and water content in its chemical structure. When formed, Chrysocolla is usually mixed up with two or three other types of minerals such as Quartz, Chalcedony, Malachite, Turquoise, and Azurite. This makes its chemical composition difficult to determine.

Its hardness is from 2 to 7 on the Mohs scale dependent on the amount of silica incorporated into the stone when it is forming. Generally, dark navy blue chrysocolla is too soft to be used in jewelry but cyan, green, and blue-green Chrysocolla can have a hardness approaching 6, similar to Turquoise. In some cases, Chrysocolla will mix with or stain Chalcedony forming a heavily silicified form of Chrysocolla which can be very hard, approaching a hardness of 7.

Chrysocolla is the most common mineral of similar appearance to Turquoise. Both Turquoise and Chrysocolla form in earthy to compact masses in light to medium blue tones, so hardness or density tests to differentiate between the two are not reliable.

Chrysocolla in its pure form is too soft and brittle to be used as a gemstone material. Most Chrysocolla that is used as gemstone material is mixed with other minerals, producing a stone hard enough to be used in jewelry and gives it some unique and colorful additions.

Minerals commonly found with Chrysocolla are Malachite, Tenorite, Cuprite, and Azurite, with Malachite being the most common mineral found in association.

One of the most sought-after forms of Chrysocolla is Gem Silica (Gem Silica is a trade name, not a mineralogical name). This rare form of Chrysocolla is a Chalcedony that has been stained by Chrysocolla giving it a translucent blue color and a hardness of 7.

Most Chrysocolla used in lapidary is actually a composite of several minerals, as previously mentioned, consisting of Chrysocolla, Cuprite, Jasper (as with Parrot Wing), Quartz (as with Stellarite also called Chrysocolla and Quartz), Chalcedony (as with Gem Silica) and sometimes even Marcasite or Pyrite. The mixture of these minerals gives this material its hardness and interesting color designs.

The next two minerals are often associated with each other. Azurite and Malachite are often found in the same deposit and are often intergrown with one another. This produces a material known as Azur-Malachite, but we will look at them individually.

## Azurite

The most easily recognized secondary copper mineral is Azurite  $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$ , a copper carbonate hydroxide. It has a hardness of 3.5 to 4 on the Mohs scale and is usually dark blue in color and gives a sky-blue streak. One of the main distinguishing features is its dark blue color.

Azurite can appear in over 45 different forms. It changes in response to air, slowly turning into Malachite over time and is destroyed by heat, becoming a black copper oxide powder. It is best known for its deep blue to violet-blue color known as “azure” for which it is named. It is usually found in a massive or nodular form. In rare situations, Azurite can be found as stalactite and botryoidal growths. The monoclinic crystals of Azurite are infrequently found as these only occur if Azurite precipitates unrestricted in a fracture or cavity and is not disrupted by later crystallization or rock movements.

## Malachite

Another more easily recognized secondary copper mineral is Malachite  $\text{Cu}_2(\text{CO}_3)(\text{OH})_2$ , copper carbonate hydroxide. It has a hardness of 3.5 to 4 on the Mohs scale and is usually light green to black-green in color and gives a light green streak. One of the main distinguishing features is its green to black-green color. It is typically found as stalactites and botryoidal coatings on the surfaces of underground cavities. When these materials are cut into slabs the surfaces often exhibit banding and eyes.

## Some Further Confusion

Not a mineral itself, Eilat Stone is a blend of Azurite, Malachite, Turquoise and Chrysocolla. It is mined in Middle Eastern City of Eilat in Southern Israel near the northwestern end of the Red Sea. It is also known as King Solomon’s stone and is the national stone of Israel.

Somewhat similar in appearance to Chrysocolla is Shattuckite  $\text{Cu}_5(\text{SiO}_3)_4(\text{OH})_2$  a copper-based mineral with the rich blues of Azurite, greens of Malachite and blue-green of Chrysocolla. It has a hardness of 3.5 on the Mohs scale. And is usually dark to light blue and gives a blue streak.

Here again this is a soft material similar to Chrysocolla, and like Chrysocolla its best lapidary use is when it forms with other minerals. It is named after the Shattuck Mine in Bisbee, Arizona, where this mineral was first discovered in 1915 by W.T. Schaller. It is also a secondary mineral in Copper deposits.

## In Conclusion

Where Turquoise is found Chrysocolla, Malachite, Azurite, Tenorite, Cuprite, Variscite as well as other copper based minerals are also found. These minerals form a sort of “copper soup” that gives us stones of varying composition. In some cases, it is hard to tell exactly what the material is without a chemical analysis. A good way to start a debate among collectors is to question the ability to distinguish Chrysocolla and Shattuckite by sight.

When looking at material, Azurite and Malachite are easily distinguished and with some study you may also be able to identify Turquoise. These minerals usually have a pure content, except for maybe the matrix in Turquoise. So, what do you call a rock or slab that has Chrysocolla, Cuprite, Malachite, and a few other minerals in it? Most of this is sold as Chrysocolla. When it comes to Chrysocolla, Shattuckite and other copper-soup rocks, it is up to interpretation as to what to call it. One of the best ideas is to label it by the prominent mineral such as “Chrysocolla with Cuprite and Malachite”. Back in the 1970’s my friend and I dug out a pocket of this “copper soup” that was some outstanding lapidary material. There was such a mixture of minerals in it that it showed wonderful designs and color. When we sold it, we called it “Chrysocolla with many associated secondary copper minerals”.

I hope this gives you an idea of some of the confusion associated with these minerals. Take some time to read up on the copper minerals and remember not all blue stones are Turquoise.

**Do you have any knowledge or information you think would be of interest to the club members. If so please submit an article. We need the input to keep this newsletter interesting and stimulating for our members.**

## Meeting Minutes

*Continued from Page 1*

June 21<sup>st</sup> holds an opportunity to attend an American Federation field trip to the Blue Forest in Wyoming to dig for petrified wood. The following day, on the 22<sup>nd</sup>, hounders can dig for fish fossils at Kemmerer, Wyoming.

Contact information:

Doug True

email: [dtruefossils12@yahoo.com](mailto:dtruefossils12@yahoo.com);

(406)670-0506

Our rock show signs need some tender loving care. They are currently stored at Gene Fischer's house and Johnny volunteered to bring one sign to each meeting for volunteers to repair and repaint as needed. Cindy volunteered to spruce up the sign brought to the next meeting.

Joe Barreca mentioned that the 200<sup>th</sup> Anniversary of the Hudson Bay Fort Colville will be in 4 years and that it is a significant historical event for North East Washington. PGMCM has an educational opportunity to present stories of impact on the environment, Native Americans, salmon, and natural resources to bring about ecological awareness. Joe suggested a possible contribution of native iron, melted into tools.

**Field Trips:** Joe Barreca has volunteered to lead a field trip to dig for pyrite, bornite, selenite crystals, and related minerals near a sulfur pocket, on the Phillips Ranch, Prospect, Monday, May 24<sup>th</sup>. Meet at the Northport Chevron at 10:00am. Please dress in layers for the weather and bring a rain jacket or slicker. Also, bring drinks, lunch, light digging tools, rock-breaking tools (sledgehammer) and a container to carry your treasures. Sign up will be at our next meeting on Tuesday, May 18<sup>th</sup>.

May or June is the time for a serpentine dig near Waitts Lake. We will be looking for noble serpentine at the Turkey Track Mine. Details will be forthcoming at our next meeting.

## Meeting Minutes

*Continued*

Johnny and Ginger plan on attending and can answer questions regarding this amazing rock-hound adventure.

**Presentation:** This evening's presentation by Jim Peters, gave a detailed account of his 2005 trip to the Blue Forest to dig petrified wood. Jim described digging 4.5 feet deep to find beautiful specimens of petrified palm trees and dentonite agates which were examined after the meeting. Some of the rocks were covered in petrified algae.

Sheila Stratton concluded the meeting at approximately 7:30pm. and we enjoyed refreshments.

Next meeting scheduled for Tuesday, May 18<sup>th</sup>, 2021.

## Upcoming Events in Our Area

Be sure to check the events before you go as some may change dates or cancel due to local Covid-19 Regulations.

5/22/2021 5/23/2021

### **Hatrock Gem and Mineral Show**

Eastern Oregon Trade and Event Center (EOTEC)  
1705 East Airport Road, Hermiston, OR  
Contact Mike Filarski, (541) 571-2593

5/29/2021 5/30/2021

### **Tall Man Rock Chippers Annual show**

Lake Co. Fairgrounds  
1900 N 4th Lakeview, OR  
Field trips to local sites leaving from the fairgrounds at 8 a.m. each day.  
Contact Infor (541) 947-4267; Email:  
[lostmyarbles@yahoo.com](mailto:lostmyarbles@yahoo.com)

6/4/2021 6/6/2021

### **Puyallup Valley Gem & Mineral Club Annual Show**

Swiss Park, 9205 198th Avenue East,

Bonney Lake, WA  
Contact Jim Christian, 13814 109th Avenue Court  
East, Puyallup, WA 98374, (253) 720-9502.

Email: jimchristian\_205@hotmail.com

6/5/2021 6/6/2021

**North Idaho Mineral Club Annual Show**  
Kootenai County Fairgrounds, Jacklin Building #25  
4056 North Government Way Coeur d'Alene, ID  
www.northidahomineralclub.org

6/17/2021 6/20/2021

**Prineville Rockhound Pow Wow**  
Cook County Fair Grounds  
1280 S. Main St. Prineville, OR  
<http://prineville.rocks/>

6/18/2021 6/20/2021

**Lower Umpqua Gem and Lapidary Society  
Annual Show**  
Reedsport Community Building  
451 Winchester Avenue, Reedsport, OR  
(541) 420-8014  
Email: reedsportrockshow@gmail.com.  
Website: <https://www.facebook.com/pg/Lower-Umpqua-Gem-Lapidary-Society-1579099422193547>

6/18/2021 6/20/2021

**AFMS and RMFMS Annual Convention**  
Sublette County Fairgrounds, Event Center  
10937 Hwy 189  
Big Piney, WY  
(307) 260-6443 Contact: Jim Gray

### Identify the “Rock or Mineral”

Last month’s rock or mineral:



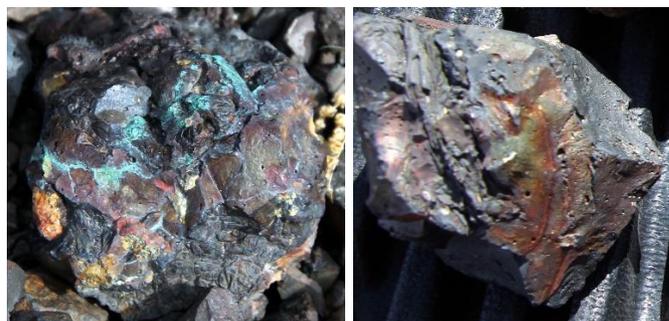
### Feldspar

$KAlSi_3O_8 - NaAlSi_3O_8 - CaAl_2Si_2O_8$  Feldspar is the name given to a group of minerals distinguished by the presence of alumina and silica ( $SiO_2$ ) in their chemistry. It is the single most abundant mineral group on Earth accounting for 60% of exposed rocks, soils, clays, and other unconsolidated sediments. Minerals included in this group are Orthoclase, Microcline, and Plagioclase Feldspars.

Feldspars crystallize from magmas as both intrusive and extrusive igneous rocks and are also present in many types of metamorphic rock.

Colors include pink, white, gray, brown, and blue. Can be distinguished by its two or three cleavage planes. It has a Mohs scale hardness of 6 to 6.5 and gives a white streak. Crystals form in triclinic or monoclinic systems.

### This month’s rock or mineral



Hint: This was in a previous newsletter article.

## Membership Dues:

\$20.00 per household per year is due to the club Treasurer Frank Stratton on the third Tuesday of November for regular members. Dues can also be sent to: Panorama Gem and Mineral Club c/o Johnie Pitman, 701 B Williams Lake Rd, Colville, WA 991114.

**Webpage:** <http://panoramagem.com/>

**Contact:** Rick McDougald  
[rick-pgmc@hotmail.com](mailto:rick-pgmc@hotmail.com)

We, **The Panorama Gem and Mineral Club**, are a multi-faceted group of mineral-minded people. Our proud members include some real gems, a few fossils, and even some diamonds in the rough. A few have lost some of their marbles, but they know where to get more! A few need to polish their coordination because they are always tumbling! And some are miners who use the “silver pick” as their tool of choice! It should be crystal clear, that we all enjoy this unique conglomeration and above all else we strive to **HAVE FUN**. And we never throw stones (away).

## A Quick Note from The Editor

*The restrictions put in place because of the Covid Virus have interrupted and changed many of the club and members plans.*

*This has resulted in the modification of our club meetings and club activities until further notice.*

*It is hoped we can resume a somewhat normal schedule of events soon, but until then stay healthy and safe.*

## Refreshment Schedule for 2021

**Last names that begin with the letters posted bring refreshments for that month**

**January – N, O, P**

**February – Q, R, S, T**

**March – W, A, B, C**

**April – D, E, F, G**

**May – H, I, J**

**June – K, L, M**

**July – N, O, P**

**August – Club Picnic**

**September – Q, R, S, T**

**October – W, A, B, C**

**November – D, E, F, G**

**December – Christmas Party**

## Panorama Gem and Mineral Club: Organizational Chart

### Officers

President:	Sheila Stratton	skstratton@hotmail.com	509-207-8506
Vice-President:	Bob Bristow	bristow71@outlook.com	509-935-4375
Secretary:			
Treasurer:	Frank Stratton	frstratton@outlook.com	509-207-8503
Trustee 1:	Jim Peters	jimNbetty17@gmail.com	509-999-9074
Trustee 2:			
Trustee 3:	Greg Cozza	troller@hotmail.com	509-710-0375

### Committee Chairs

Program Coordinator:	Sheila Stratton	skstratton@hotmail.com	509-207-8506
Hospitality:	Betty Peters	jimNbetty17@gmail.com	509-999-9074
Historian:			
Newsletter:	Jim Retzer	jimrocks@recycledhistory.com	509-738-2503
Show Chair	Johnie Pitman	jgpitman@outlook.com	509-684-8887