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to promote, support, protect and expand the collection of mineral specimens and to further the recognition of the scientific, economic and aesthetic value of minerals and collecting mineral specimens.

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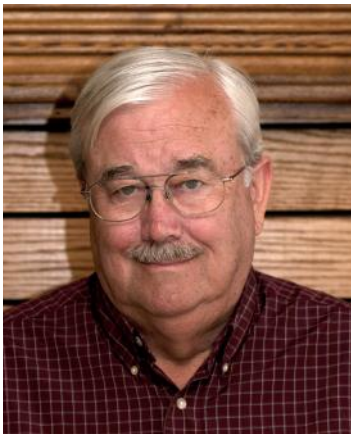

President's Message
By William W. Besse

This has been a different year with many of our favorite events disrupted if not cancelled. Hopefully, you have been able to maintain some of your routine plus add in online seminars and lecture series that have replaced live events. I know that is not the same as visiting these events but this is what we have and we need to make the most of them.

Hopefully, next year will see a return toward normal.

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Motion for Suspension of Dues

A motion has been made by Alex Schauss and seconded by Mark Jacobson to suspend dues tendered to national FM. In my opinion this will not seriously affect the national FM Treasury.

The motion was:

In light of the adverse and disruptive effect the SARS-CoV-2 virus has had, which causes COVID-19, on our society, and the chilling effect it has had on the chapters of Friends of Mineralogy to make field trips and conduct business, that the payment of chapter dues to national Friends of Mineralogy be suspended for the year 2020.

Passed on August 18th.
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Good News and Bad News for New Mexico Mineral Enthusiasts

By Virgil W. Lueth - Museum Director

First the Good News! New Mexico Governor Lujan Grisham announced, during a recent press conference, that museums can reopen utilizing covid-safe practices. The New Mexico Bureau of Geology and Mineral Resources Mineral Museum on the campus of New Mexico Tech in Socorro reopened September 8, 2020. The museum established covid-specific protocols, outlined below, that are designed to keep employees of the Mineral Museum and Bookstore safe, as well as supporting the safety of visitors.

- We will reopen our Mineral Museum and Bookstore with limited access controlled by continuing to leave the main doors to our building locked. Visitors will be provided with a number to call in order to be let into the Museum and/or bookstore, which will be staffed from 9 am to 5 pm Monday through Friday and 10 am to 3 pm on Saturday and Sunday. Entrance to the facility will be restricted to non-quarantined individuals from New Mexico and states approved by the State of New Mexico (posted at the entry of the museum). The staff member who comes to the front door to let the visitors in will ensure that the visitors are wearing facemasks, as required by state order. Any visitors without facemasks will not be granted entry to the building. In the case that visitors without appropriate PPE become insistent on being granted entry, campus security can be alerted. Doors that lead from atrium to the rest of the Bureau building will remain locked.
- When visitors, wearing appropriate PPE, are given access to the building, the staff member who lets them in will give them a short description of the social distancing protocols that will be expected during their visit. This will be done in the Bureau atrium, which is spacious. Staff will point out sanitizer stations and request all visitors wash their hands. All visitors will be expected to maintain a distance of 6’ from all staff members, and any other visitors. Visitors will be asked to avoid touching surfaces, wherever possible.
- Visitors will need to provide contact information for 1 person in the group, in case contact tracing becomes necessary. An entry into the log book will be required prior to accessing the facility.
- The museum and bookstore will be permitted to operate at up to 25% capacity. However, having that many people in the museum and/or bookstore at one time would be difficult to manage, and arriving groups of visitors may be asked to wait until another group has left, at the discretion of the supervising staff member. Groups of less than ten can access the museum and a limit of 3 will be allowed in the bookstore. Larger groups, up to 25 for the museum, can only be accommodated by appointment.

•A NMBG&MR staff member will be present in the Mineral Museum and Bookstore on any given day. NMT custodial staff will be asked to periodically disinfect surfaces in the bookstore, museum and restrooms. Bureau staff members will also be provided with disinfectant and paper towels, in case visitors arrive outside the custodial staff working hours or immediate clean up is desired. A log book of times that the facility has been disinfected will be kept by custodial and NMBGMR staff.
We will encourage all rock and mineral identification to continue via distance access (email and photos). In person identification will require an appointment with an appropriate individual.

And now the Bad News…Due to the other covid-specific mandates, the 42nd New Mexico Mineral Symposium will be cancelled this year. Friends of Mineralogy (National) and the Colorado Chapter have helped sponsor this event over the years. Quarantine requirements for our guests, the anticipated attendance size, and university specific requirements will not allow us to host an in-person event. Plans are in the works for a possible remote symposium so please check our website for developments (https://geoinfo.nmt.edu/museum/). We look forward to hosting the 42nd New Mexico Mineral Symposium the following year on Nov. 12-14, 2021.

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Bob Reynolds - 1943-2020

Bob Reynolds, 76, passed away Tuesday morning, July 21st, 2020 at home in Redlands California with his wife Jennifer at his side. He succumbed to bone cancer after five years of treatments for prostate cancer. Bob has been loved by thousands of individuals during his lifetime of sharing about rocks, minerals and fossils at the San Bernardino County Museum for 32 years and then as a volunteer preparing fossils and engaging visitors for years beyond. He was President of the Southern California Friends of Mineralogy for over 25 years, Field Trip Coordinator for Cal State's Desert Symposium Inc. for over 25 years and published hundreds of articles during his years of research. Memorial services are not feasible at the present time, but will be conducted after this COVID-19 pandemic subsides. He is survived by his wife Jennifer, son Jedediah, daughter Katura, and 4 grandchildren.

The mineral Reynoldsite is named after him.
https://www.mindat.org/min-42233.html

(Photo compliments of Mindat)
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Minerals of the Penn/MD Materials Quarry, Fulton Township, Lancaster County, Pennsylvania, Part 4, Carbonate Minerals

Ronald A. Sloto, P.G.
West Chester University

Introduction

The Penn/MD Materials quarry, owned and operated by the H&K Group, produces aggregate from ultramafic rocks of the Baltimore Mafic Complex, known locally as the State Line Serpentinite District. This complex of ultramafic and associated gabbroic rocks is believed to be a remnant from the roots of an island arc complex formed about 490 to 510 million years ago (Smith and Barnes, 1998; Smith and Barnes, 2008).

All analyses were performed at the West Chester University Center for Microanalysis and Imaging, Research and Training (CMIRT). Imaging and chemical analyses were done using an FEI Quanta 400 environmental scanning electron microscope integrated with an Oxford AZtec X-ray energy dispersive spectrometer (SEM-EDS). Samples were unpolished and uncoated.

The author thanks Jay Lang and the H&K Group for access to the quarry, Dennis Buffenmeyer and Tom Pankratz for providing specimens for analysis, and Robert C. Smith, II, for helpful comments on this manuscript.

Carbonate minerals observed at the Penn/MD Materials quarry include aragonite, calcite, dolomite, hydromagnesite, magnesite, and nakauriite, which are discussed here. Carbonate minerals observed also include desautelsite and pyroaurite, which were described in part 1 of this series (Sloto, 2019).

The copper magnesium carbonate mineral mcguinnessite occurs in the adjacent Cedar Hill quarry, but it has not yet been verified from the Penn/MD Materials quarry. I have tested over a dozen suspected mcguinnessite specimens from the Penn/MD Materials quarry (mostly provided by other collectors); however, none of them contained copper and, therefore, were not mcguinnessite. In all cases, they were a green to blue green amorphous-appearing serpentine mineral.

Aragonite $CaCO_3$

Aragonite is the second most common polymorph of natural calcium carbonate. Two specimens of clear, elongated crystals (figs. 1 and 2) were provided for analysis by Dennis Buffenmeyer. Analysis by SEM-EDS showed both to be calcium carbonate. They are assumed to be aragonite on the basis of crystal form. Aragonite is known from other serpentine localities, such as the nearby Wood mine (Geyer and others, 1976; Wilson, 2011). Aragonite crystals from the Penn/MD Materials quarry appear identical to those from the Wood mine pictured in Wilson (2011, p. 316).

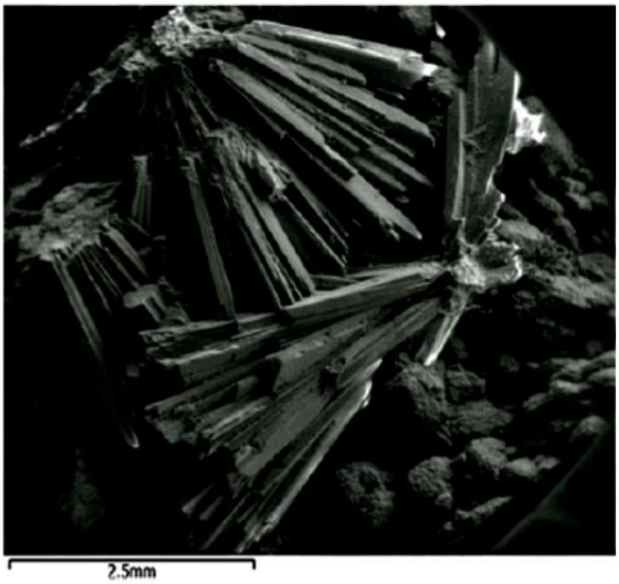

Figure 1. Scanning electron microscope image of aragonite crystals from the Penn/MD Materials quarry. Magnification is approximately 40 X.

Figure 2. Scanning electron microscope image of aragonite crystals from the Penn/MD Materials quarry. Magnification is approximately 75 X.

Calcite $CaCO_3$

Calcite is a rare mineral at the Penn/MD Materials quarry. Only one specimen (RS-4112-B) was analyzed that could be considered calcite. The chemical composition was $(Ca_{0.88}Mg_{0.22})CO_3$.

Dolomite $CaMg(CO_3)_2$

Dolomite is a rhombohedral carbonate mineral with the ideal formula $CaMg(CO_3)_2$ in which calcium and magnesium occupy preferred sites. Dolomite is a common mineral at the Penn/MD Materials quarry. It occurs as crystals (figs 3 and 4), cleavages (figure 5), and as massive dolomite (fig. 6). It can be brown, orange, white, or clear. Cleavages of white dolomite resemble calcite (fig. 7). The Mg to Ca ratio of 10 dolomite samples ranged from 1:0.47 to 1:2.18 with an average Mg to Ca ratio of 1:0.97.

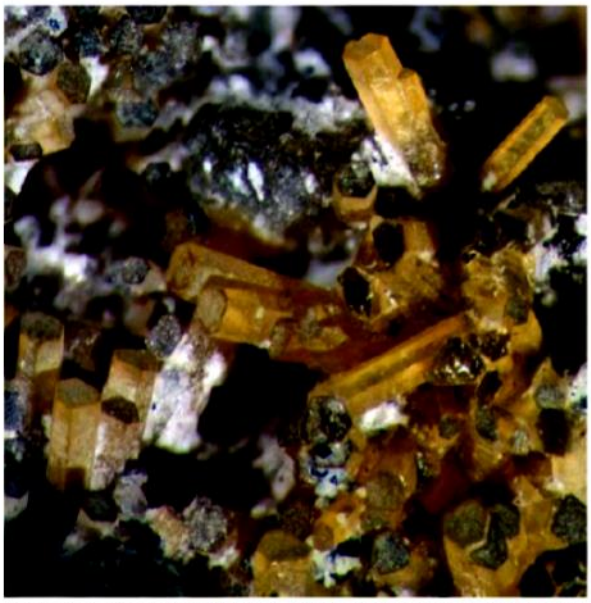

Figure 3. Dolomite crystals from the Penn/MD Materials quarry, magnified. Sloto collection RS-4049.

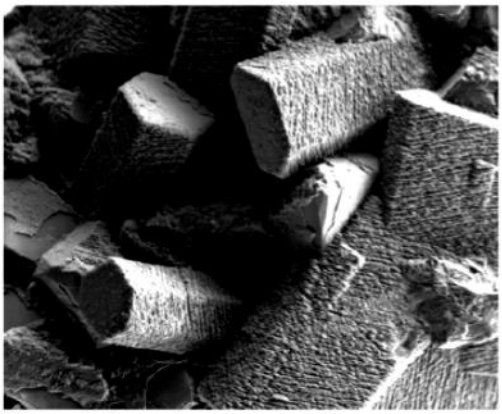

Figure 4. Scanning electron microscope image of dolomite crystals from the Penn/MD Materials quarry. Magnification is approximately 60 X. Sloto collection RS-4140.

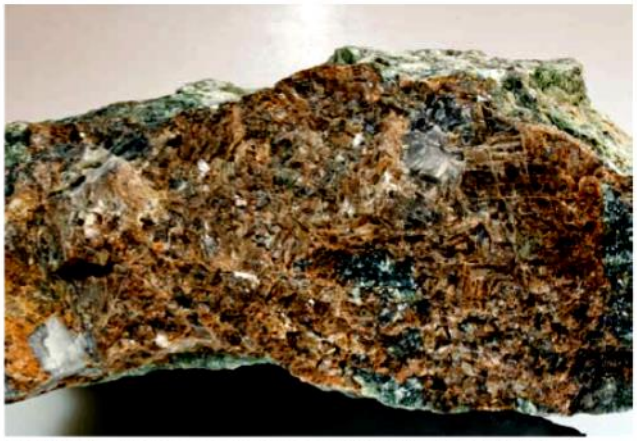

Figure 5. Dolomite cleavages from the Penn/MD Materials quarry. Field of view is 10 cm.

Figure 6. Massive dolomite from the Penn/MD Materials quarry, 4cm. Sloto collection RS-4129. The brown mineral is dolomite.

Figure 7. Dolomite cleavage from the Penn/MD Materials quarry, 4.5 cm. Sloto collection RS-4224.

Hydromagnesite $Mg_5(CO_3)_4(OH)_2 \cdot 4H_2O$

Hydromagnesite occurs rarely at the Penn/MD Materials quarry. I found only one specimen (fig. 8) in the quarry. The hydromagnesite forms clear to white acicular crystals in divergent sprays on magnesite. Another specimen (fig. 9) was given to me many years ago by Ed Carvalho, who collected it in 1996. The identification of both was confirmed by SEM-EDS.

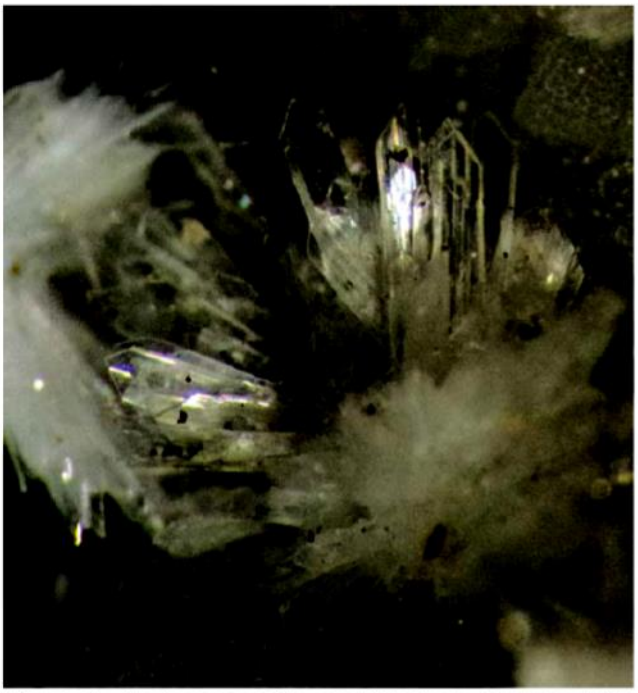

Figure 8. Hydromagnesite crystals from the Penn/MD Materials quarry; crystal sprays to 3 mm. Sloto collection RS-3954.

Figure 9. Hydromagnesite from the Penn/MD Materials quarry. Field of view is 3 mm. Sloto collection RS-2812. Collected by Ed Carvalho in 1996.

Magnesite $MgCO_3$

Massive magnesite is abundant at the Penn/MD Materials quarry in a variety of colors and forms. The most common color is white, but it can be brown or gray. It forms thick white veins in serpentine (fig. 10), interlayered with serpentine (fig. 11), globular (fig. 12), and botryoidal (fig.13). It is sometimes mistaken for chalcedony because of a similar appearance (fig. 12).

Figure 10. Massive magnesite from the Penn/MD Materials quarry, 8 cm. Sloto collection RS-4207. The magnesite fluoresces a weak white under shortwave ultraviolet light.

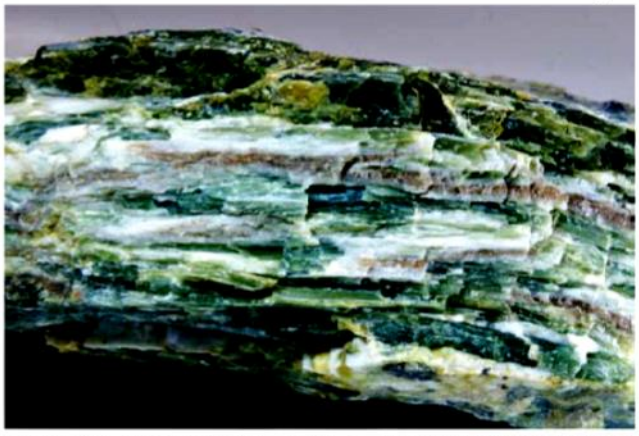

Figure 11. Magnesite interlayered with serpentine from the Penn/MD Materials quarry. Field of view is 7 cm. Sloto collection RS-3307.

Figure 12. Magnesite from the Penn/MD Materials quarry, 8.5 cm. Sloto collection RS-4272.

Figure 13. Magnesite from the Penn/MD Materials quarry. Field of view is 1 cm. Sloto collection RS-4100.

Magnesite/Quartz Mixture $MgCO_3 + SiO_2$

Several SEM-EDS analyses of a white mineral with an undulating surface (fig. 14) showed it to be a Si-C-Mg-O mineral with a composition that did not match any known mineral. Further investigation determined that the mineral was a mixture of equal parts magnesite and quartz. After examining several of these specimens, they became easy to recognize because the surface usually was cracked when viewed under magnification (fig. 15). It is possible that the SiO_2 could be opal; however, further testing would be necessary.

Figure 14. Magnesite-quartz mixture from the Penn/MD Materials quarry. Field of view is 2 cm. Sloto collection RS-3956.

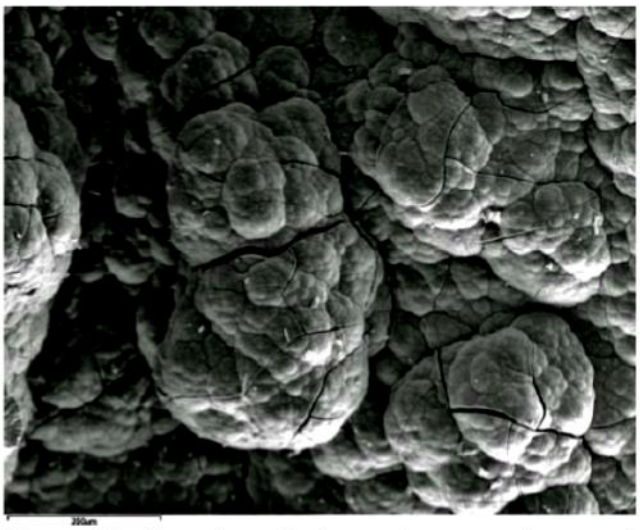

Figure 15. Scanning electron microscope image of magnesite-quartz mixture from the Penn/MD Materials quarry. Magnification is approximately 360 X. Sloto collection RS-4136.

Nakauriite

There has been much controversy surrounding the composition of nakauriite. It was originally described by Suzuki and others (1976) as a copper sulfate-carbonate hydroxide hydrate mineral from Nakauri, Japan, with the idealized chemical formula $(Mn,Ni,Cu)_8(SO_4)_4(CO_3)(OH)_6 \cdot 48H_2O$. The nakauriite from Japan occurred as clear, sky-blue bundled aggregates of very small slender to fibrous crystals less than about 0.2 mm in length and 0.006 mm in width. It occurred as fracture fillings in a brucite-bearing serpentinite and was named nakauriite for the locality.

Peacor and others (1982) determined by X-ray diffraction analysis that the cuprohydromagnesite and cuproartinite from Gabbs, Nevada, described by Oswald and Crook (1979) were actually nakauriite. The research done by Oswald and Crook was done prior to the publication of the paper by Suzuki and others (1976) describing nakauriite. Cuprohydromagnesite $(Cu,Mg)_5(CO_3)_4(OH)_2 \cdot 4H_2O$ occurred at Gabbs as translucent, blue, bladed, elongated crystals; and cuproartinite $(Cu,Mg)_2(CO_3)(OH)_2 \cdot 3H_2O$ occurred as blue acicular translucent, elongated crystals (Oswald and Crook, 1979). Note that neither contained sulphur and both contained magnesium, which differs from the material from Nakauri, Japan. According to Peacor and others (1982), electron microprobe analyses of nakauriite from both Japan and Nevada showed little or no sulphur present. Peacor and others (1982) did not present additional chemical data.

Foord and others (1985) described the occurrence of nakauriite from the adjacent Cedar Hill quarry in the Pennsylvania Chapter Friends of Mineralogy Newsletter: *"We would like to report on the occurrence and identification of a brightly colored fibrous (as seen in an SEM photograph), pale blue to medium navy blue, to platy, medium navy blue mineral which was identified by Robert C. Smith, II, in April, 1983, as nakauriite.... Microprobe analyses showed little or no sulfur to be present, and microchemical tests produced the same results... The mineral occurs as blue fibrous sprays and mats in thin coatings with antigorite, some magnesite, quartz, and talc at the Cedar Hill serpentine quarry, Fulton Township, southwestern Lancaster County."*

Samples were supplied by Thomas O'Neil to Deane K. Smith and others, who obtained X-ray diffraction data between 1972 and 1983. However, because of the limited amount of clean material free from antigorite, a good chemical analysis could not be obtained (Foord and others, 1985, p. 4).

In 1975, Robert C. Smith, II, and Robert B. Finkelman collected similar bright blue material from the Cedar Hill quarry. However, the mineral was mixed with antigorite, and, based on Smith's optical data, could not be fully identified (Smith, 1978, p. 209).

Additional material of a better quality and in larger quantities was collected from the Cedar Hill quarry by Bryon Brookmyer and Martin Anne in September 1982. Some of the material was sent to Robert Smith II, Eugene Foord, Allen Heyl, and Deane Smith. Robert Smith obtained X-ray diffraction powder patterns and matched them with nakauriite in April 1983. Similar X-ray diffraction data were obtained by Foord on light blue and medium blue varieties of nakauriite. SEM examination by Foord showed Cu, Mg, Fe, and Ni to be present. Iron was present in minor amounts, but no sulfur was detected. The ratio of Cu to Ni was estimated to be about 4:1 in the light blue material and was somewhat greater in the darker blue material. Lower amounts of Cu and Ni and greater amounts of Mg were found in the almost terminated ends of some of the light blue fibers. Mn was not detected in the Cedar Hill nakauriite. Foord and Heyl concluded that there may be three end members: Cu, Ni, and Mg, and possibly a fourth (Mn). The presence of carbonate was confirmed by infrared spectra made by Arnold H. Fainberg on material from the Cedar Hill quarry, as well as from Nakauri, Japan (Foord and others, 1985, p. 5-7).

Barnes (1986, p. 8) stated this about nakauriite from Pennsylvania: *"Additional work is needed to fully understand this mineral that has been a source of controversy and great interest to the mineralogical community. What is clear is that it is still possible to encounter very rare and attractive minerals that have not been previously known in Pennsylvania, and about which much remains to be learned."*

A sample of nakauriite (fig. 16) collected in the Penn/MD Materials quarry by Alex Kane was furnished to the author by Tom Pankratz for SEM-EDS analysis. Analysis of the sample (table 1) showed the dominant metals were, in decreasing order, magnesium, copper, and nickel. Sulphur was not detected. The manganese and iron concentrations were very low. Contamination by antigorite likely was minimal as indicated by the low value for silicon. The analysis gave the approximate chemical formula $(Mg_{5.75}Cu_{1.73}Ni_{0.68})(CO_3)_4(OH)_2 \cdot 10H_2O$.

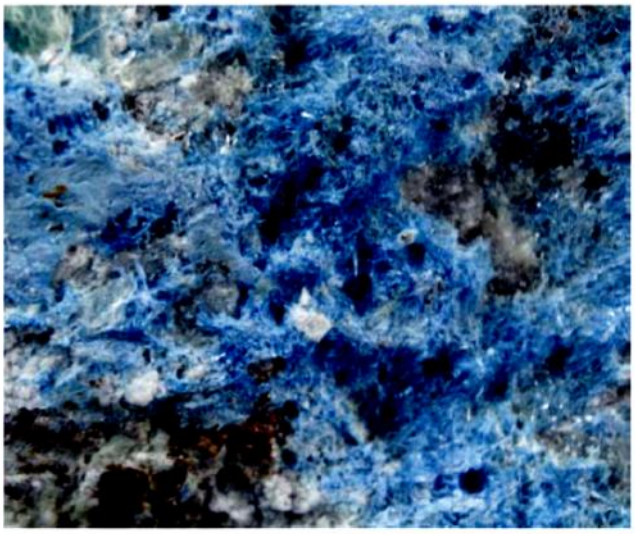

Figure 16. Nakauriite from the Penn/MD Materials quarry, magnified. Tom Pankratz specimen.

Table 1. Results of X-Ray energy dispersive spectrometer (EDS) analysis of nakauriite from the Penn/MD Materials quarry. Values are in weight percent. The median represents 37 measurements taken at 6 sites.

Element	C	O	Mg	Si	Ca	Mn	Fe	Ni	Cu
Median	6.62	52.73	19.25	0.57	0.17	0.03	0.29	5.52	15.14

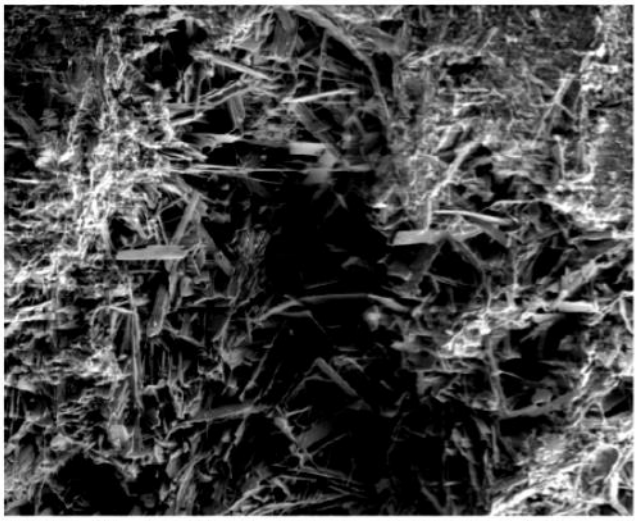

Figure 17. Scanning electron microscope image of nakauriite from the Penn/MD Materials quarry. Magnification is approximately 180 X. Tom Pankratz specimen.

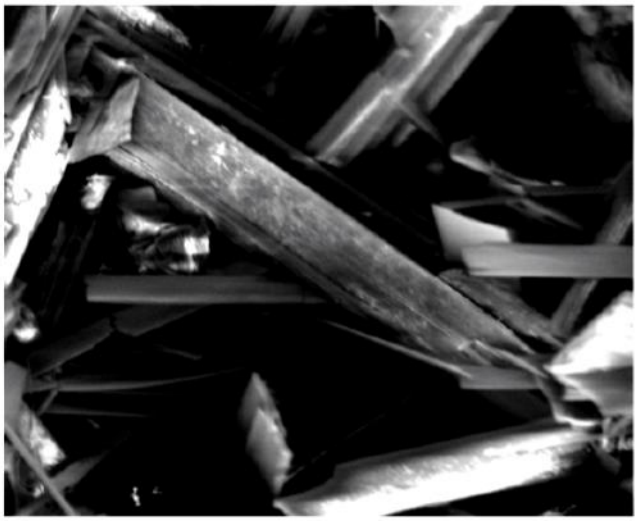

Figure 18. Scanning electron microscope image of nakauriite from the Penn/MD Materials quarry. Magnification is approximately 1275 X. Tom Pankratz specimen.

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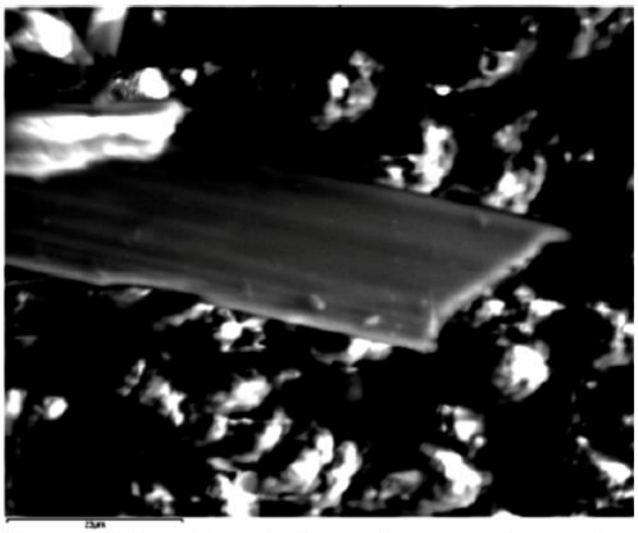

Figure 19. Scanning electron microscope image of a nakauriite crystal from the Penn/MD Materials quarry. Magnification is approximately 3000 X. Tom Pankratz specimen.

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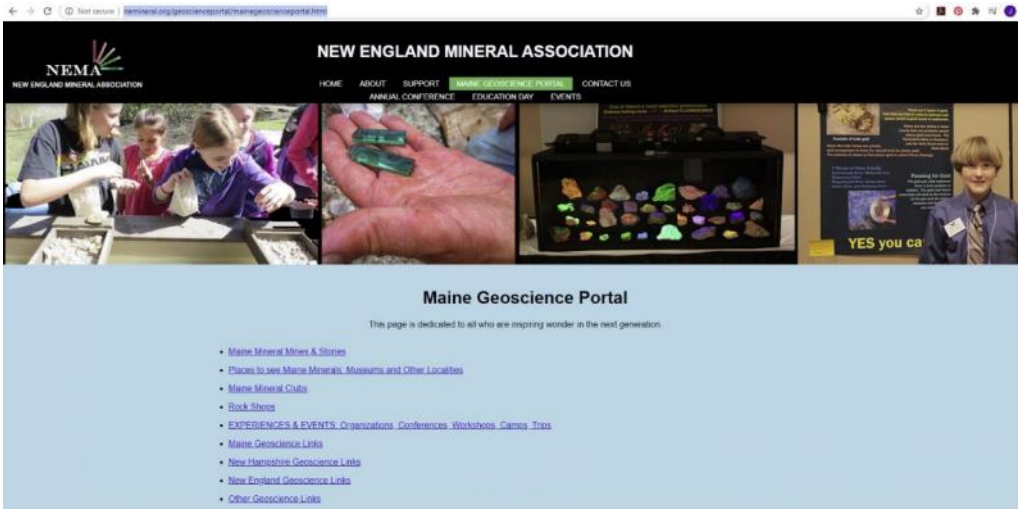
The Maine Geoscience Portal:

NEMA had to cancel our annual conference, but it gave us an opportunity to focus on the Maine Geoscience Portal (MGSP, or "Portal"), which is now nearing its initial completion. It can be found on the NEMA website at this address: http://www.nemineral.org/geoscienceportal/mainegeoscienceportal.html



NEMA's President, Jeff Morrison, spent countless hours collecting the information and planning this project. NEMA's ED, Jan Morrison, says, "Every spare minute, he retreats to the computer to continue putting meat on the bones of the outline for the Portal, in calling people for information and contributions, in seeking permissions to have access to photos, manuscripts, books, and journals, all so a broader audience has a singular location to find information, and to find it easily. This portal is his gift to the mineral community, and he wants nothing more than to be able to "spark creativity" for this and future generations in discovering the mineralogy, geology, mining, and gemology worlds."

For several years Jeff commented on all the information that is available on minerals, but that it is often hard to locate or not cross-referenced anywhere; that he happens on it more as a serendipity rather than by intent.

He would like it to expand to every state in the nation, and even beyond. One massive site where you can find (reputable) mineral info.

Huge appreciation to Rock & Gem for a fully unsolicited article in their July issue (https://www.rockngem.com/maine-mineralogy-takes-center-stage/) recognizing NEMA and Jeff in these efforts.

NOTE: The Geoscience Portal is a dynamic site, and will continue to be refined, improved, expanded, and updated. More to come...

Accidental Encounters: Reflections on the Role of Serendipity in Mineral Collecting

by

Richard Francaviglia

(Continued from previous issue)

"Gold is where you find it"

My next accidental mineral encounter was a result my life-long interest in trains. Model railroading has been one of my hobbies, and I've frequently found some fine models at model train shows. What does this have to do with minerals? Well, I must admit that they were not on my mind when I attended a big model train show in Fort Worth, Texas in 2005, though mining-related railroads were. When I passed a vendor's table featuring some vintage HO scale freight cars, I spied two flat cars that looked perfect for carrying a load of miniature copper anodes I was making. Those flat car models were long out of production but in very good condition. However, to use them, I'd have to get rid of the five clear plastic vials that someone had glued onto their flat decks. *My goodness*, I thought, *someone sure made a mess of things by gluing them onto these cars.*

The vendor noticed my doubts and added "Other guys coming by also think that these are really unrealistic gold ore containers, so I've just lowered the price for you -- to five bucks for both cars." Taking a closer look at those plastic containers, I realized that the fragments of gold they supposedly contained looked mighty real. After all, I'd seen a lot of gold specimens, even panned for some along California's Trinity River back in 1962, so I knew the real thing when I saw it. In each vial, the gold specimens were at the top as they were resting on what appeared to be black felt. Looking more closely I realized that the names of the mining areas that were printed on them in very small but legible letters (only about half a millimeter or 1/32nd of an inch high) were the places from which these specimens had originated. *Wow*, I thought, *not only mineral specimens but actually real gold -- and even labeled, no less!* "I'll take them!" I said, and the deal was done. In more detail, the labeled specimens were as follows:

"GOLD -- NOGAL, LINCOLN CO. NEW MEXICO -- 5 PCS."

The five specimens in this vial are a visual delight, each about 3 to 3.5 mm (ca. 1/8 of an inch) and beautifully revealing gold's distinctive crystallized forms. The town of Nogal ("walnut" in Spanish) has been in existence since about 1880, and Mindat discusses the crystallized gold from the American Mine at this location. I consider this a rare find from a part of the West associated with Billy the Kid.

"GOLD -- KUSKIN RIVER, ALASKA."

To my amazement, this vial contains one roughly triangular shaped nugget about the size of a shelled sunflower seed (ca. 3/8 of an inch long and 1/4 inch wide, or 9 X 4 mm). I suspect that the name "Kuskin" on the label refers to the Kuskowim River, also called the Kusko River, of southwestern Alaska. Placer gold was discovered along this river in 1901 near Aniak, and miners still find it in scattered deposits to this day.

"GOLD -- BAUER MINING DISTRICT, BROGAN, OREGON"

The two specimens in this vial are flakes of placer gold, one about 3/16 of an inch (c. 5 mm) in diameter, the other just a bit larger than 1/16 "(2.5 mm). I could find no information on the Bauer Mining District, and I think that the "U" in the mining district's name might actually be a "K" -- in which case it would be the well known BAKER MINING DISTRICT of eastern Oregon. For the record, Brogan is a small community in Malheur County, which lies just to the south of Baker County, and there are active mining claims in this area as well.

"GOLD -- TRUCKEE RIVER, PLACERVILLE, NEV."

This vial containing one specimen that is partially crystalline and is roughly triangular in shape, measuring just under 1/4 inch (5 mm) in size really piqued my curiosity. Labels usually confirm a location, but this one mystified me for a couple of reasons: First, the Truckee River was never a significant gold-producing location, especially in Nevada. Second, there is not -- and probably never has been -- any place formally named Placerville in Nevada! Then again, there just might have been an informally named Placerville along the Truckee River, which has its headwaters in California (Lake Tahoe) and flows eastward through Reno before ending in Nevada's Pyramid Lake. Of course, there is a famous mining town named Placerville -- and a county named Nevada in California -- but that Placerville it is located in El Dorado County, and is nowhere near the Truckee River. That said, it is possible that this specimen was found in along Truckee River on the eastern slopes of the Sierra Nevada, just west of Reno -- in which case it is pretty rare.

"GOLD -- Black Hills, South Dakota"

This is a beautiful specimen of lode gold, some of it crystalline and some massive, but all clinging to and part of a darker matrix. It is about 8 X 6 mm (ca. 1/4 inch) in size, and I suspect might be from the Homestake Mine at Lead (pronounced "leed'), but am not sure. The label on this vial appears a bit different than the others --printed in upper and lower case letters using a different pen.

As I paid my five dollars and walked away from that table with those flat cars in hand, you can bet that minerals were now very much on my mind. A few days later, when I showed them to an economic geologist at the University of Texas at Arlington, he exclaimed, "My God, what a bargain! These are not only real gold, but a couple are pretty rare -- beautifully crystallized!" I later carefully removed the vials from the model flatcars, discovering dealer-related information on the bottom of each. The first four were from "S.W. Minerals, Albuquerque, New Mexico" and the last was from "Silver Mt. Coins, Rapid City, S.D." All had been purchased in the period from 1985 to 1987. For the record, Southwestern Minerals' store opened in the early 1960s, is still in business today, and they still sell gold specimens. However, Silver Mountain Coins closed its doors after the owner retired about five years ago.

(To be continued in the next issue)

Pollucite Occurrences of Canada

By Mark Jacobson

This listing was originally created by Dittrich (2017, p. 24-33) as a table in Chapter 2, and revised-updated by Mark I. Jacobson

Manitoba

Tanco pegmatite, north shore of Bernic Lake, Manitoba. For a time it was the world's largest producer of pollucite as well as tantalum ore (Černý and Simpson 1978).

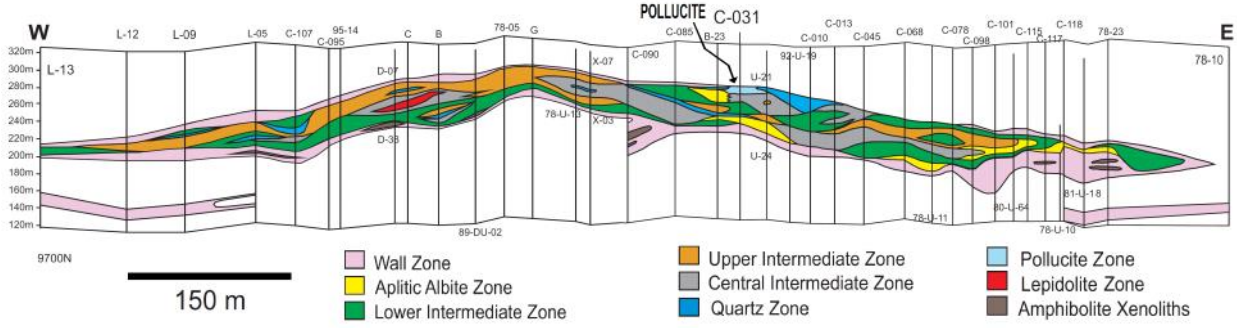
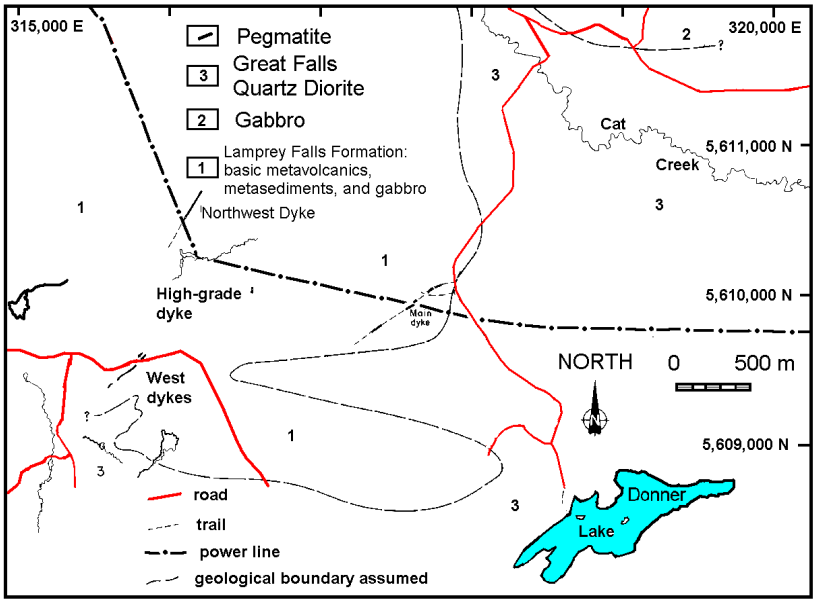


Figure 1. An east-west cross section of the Tanco pegmatite, horizontal = vertical scales. Modified from Martins, Kremer, and Vanstone (2013, p. 10-11). The pollucite zone, penetrated by core hole C-031, is in light blue on east side of pegmatite adjacent to the hanging wall contact.

Buck Claim, east shore of Bernic Lake, Manitoba. Černý and Lenton (1995, p. 665) documented that the Buck pegmatite at one time had contained pollucite but the original 60 x 20 x 30 cm pods had been completely altered to clay (Černý 1978). The original pollucite had been located in a core margin unit composed of cleavelandite with masses of amblygonite and K-feldspar. The core is composed of blocky quartz and K-Feldspar with lesser amounts of book muscovite.



High Grade Dyke pegmatite, 2600 meters northwest of Donner Lake, Cat Lake - Winnipeg River pegmatite field (WGS84, UTM 15U, 316,416 m E, 5,610,188 m N). This pegmatite, formerly on the Lithium No. 1 claim, is exposed for 18 meters with a thickness that varies from 0.6 to 1.2 meters. The pollucite is found as pods and lenses up to 15 cm long in association with spodumene, lepidolite, albite, elbaite and quartz. (Teertstra et al. 1992, 1999, Bannatyne 1985)

Figure 2. Location of High Grade dyke, northwest of Donner lake. Map revised from Bannatyne (1985, p.69)

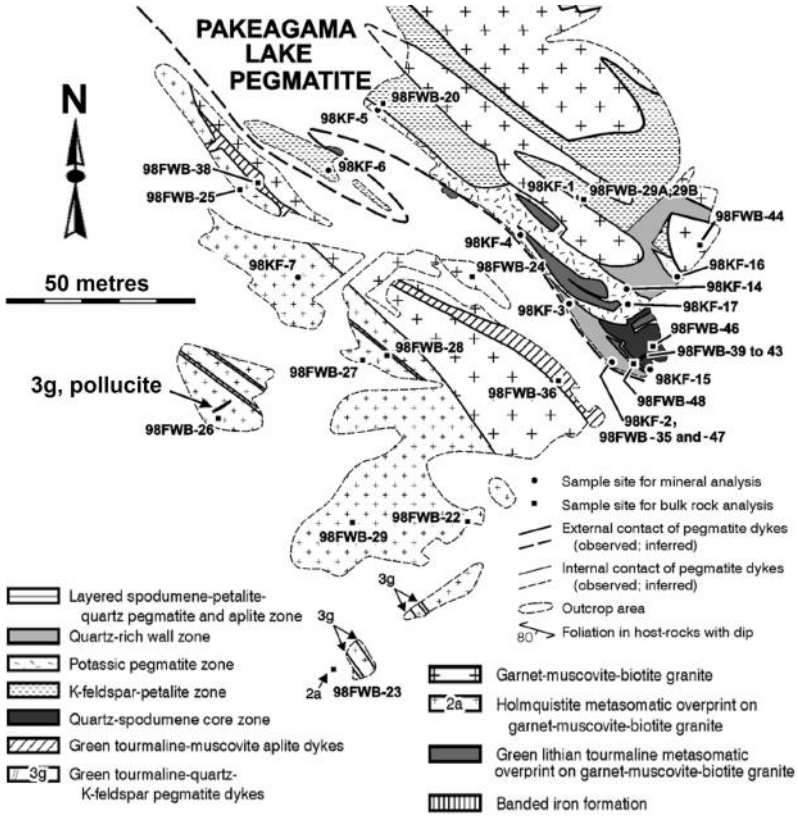
Lepidolite-type pegmatites*, *Red Cross Lake pegmatite field, Manitoba. Along the east shore, in the northern area are a total of 17 east-west trending, sub-vertical, parallel pegmatite dikes that reach a maximum thickness of 3.6 meters (Černý et al. 2012a, p. 1810-11). The dikes are composed of sheared quartz-feldspar-lepidolite with accessory spodumene, elbaite, spessartite, apatite, amblygonite -montebrasite and lithiophilite. Pollucite is a locally abundant constituent in these Lepidolite-type dikes (LPG) as microscopic grains up to 5 mm in length that form lenticular porphyroclasts (Černý et al. 2012b, p. 1856).

British Columbia

***Mount Begbie*.** A small pegmatite field is located on the south slope of Mount Begbie. Although Dixon et al. (2014a) does not mention pollucite, Dixon, et al. (2014b) does mention pollucite from this pegmatite field. Most of the pegmatites in this field are less than a meter wide and at least 10 meters long. The largest pegmatite, named granite, is slightly in excess of 500 meters long and almost 10 meters thick near its center, tapering to the outcrop ends.
Northwest territories

***Stargazer Claim pegmatites*,** O'Grady batholith, Northwest Territories. A pegmatite field that is found within a pegmatitic granite that is itself found within the O'Grady batholith. Some of the pegmatites contains minerals typical of mixed NYF-LCT sources such as amazonite, monazite and allanite sometimes associated with elbaite. "Accessory phases in the [lithium-bearing] pegmatite bodies (Table 1) include rock-forming pollucite (i.e. not a pocket phase)" (Ercit et al. 2003, p. 123).

Ontario



Pakeagama Lake pegmatite, on claim 1232441, north of lake, Kenora district, northwest Ontario. Pollucite in masses up to 6 cm across has been found in a pegmatite vein (2 to 40 cm in width) intruded into a peraluminous garnet-muscovite-biotite granite just 50 meters southwest of the Pakeagama Lake pegmatite (Tindle et al. 2002, p. 762, Breaks, Selway and Tindle 2005, p. 91-92). The pollucite-bearing pegmatite is composed of blue-gray potassium feldspar, quartz, albite, with accessory green fluor-elbaite.

Figure 3. Pollucite is found in a pegmatite dike labeled with sample 3g. Map from Breaks, Selway, and Tindle (2005, p. 92).

Pollucite Dike, Lilypad Lakes pegmatite group, Fort Hope pegmatite field, Kenora District, Ontario. LCT pegmatite minimum 370 m long, small anhedral pollucite masses mixed with spodumene, quartz and albite (Breaks and Tindle 2004, p. 11-4).

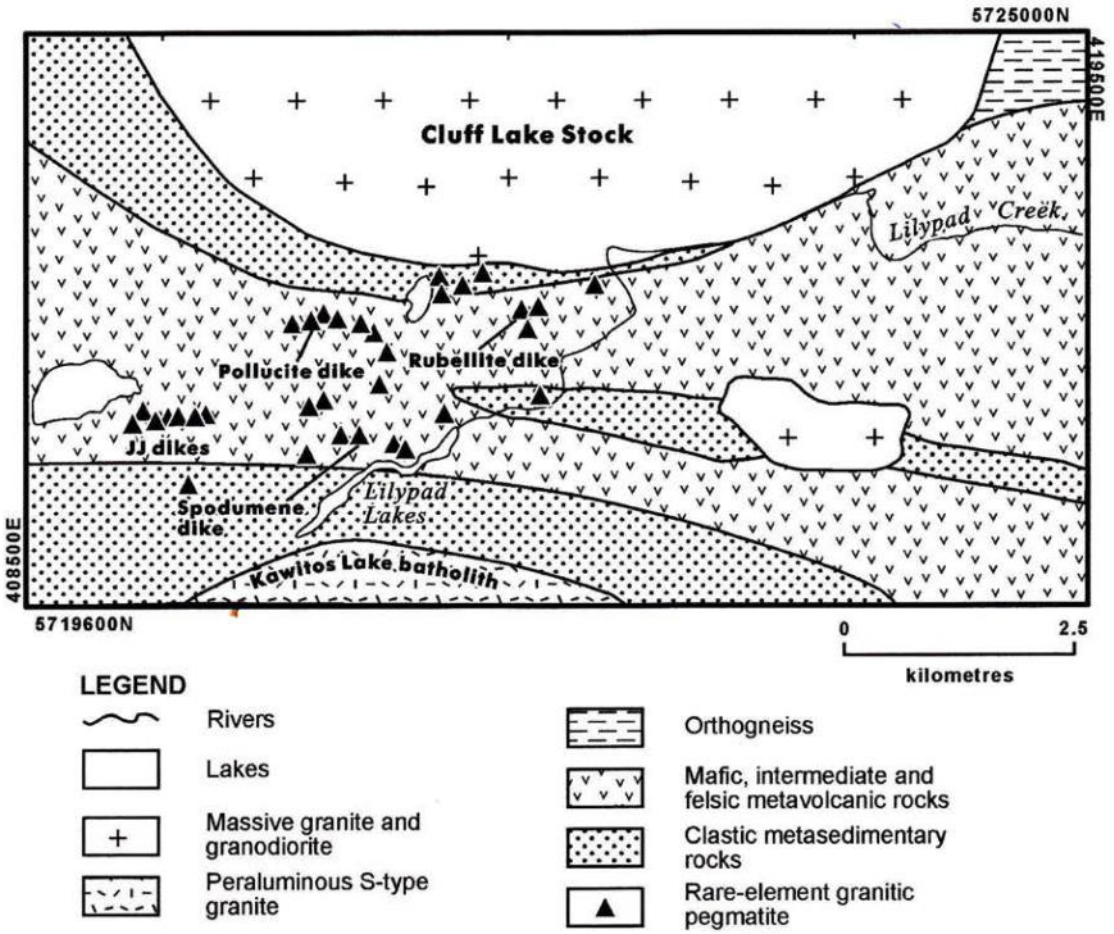


Figure 4. Index map showing location of Pollucite dike, JJ Pegmatite dikes and Rubellite dike in the Lilypad lakes pegmatite group. Map adapted from (Breaks and Tindle 2004, p. 11-3)

Rubellite Dike, Lilypad Lakes pegmatite group, Fort Hope pegmatite field, Kenora district, Ontario. LCT pegmatite (Breaks and Tindle 2004, p. 11-4).

JJ pegmatite dikes, Lilypad Lakes pegmatite group, Fort Hope pegmatite field, Kenora district, Ontario. A LCT-type pegmatite contains pollucite masses up to 17- 35 cm (Breaks and Tindle 2004, p. 11-4).

North Aubry pegmatite, Seymour Lake pegmatite group, north of the Ferland Train Station, Ontario. The pegmatite is 260 m long by 13-25 m thick. Pollucite was found in a 6 x 13 cm mass within the inner core zone of spodumene-cleavelandite-quartz. “Part of this mass comprises unaltered pollucite (confirmed by x-ray), but transected by narrow veins (0.5 to 1 cm thickness) composed of silver mica, milky albite, and an unknown , secondary mineral” (Breaks, Selway, and Tindle 2006, p. 13-15).

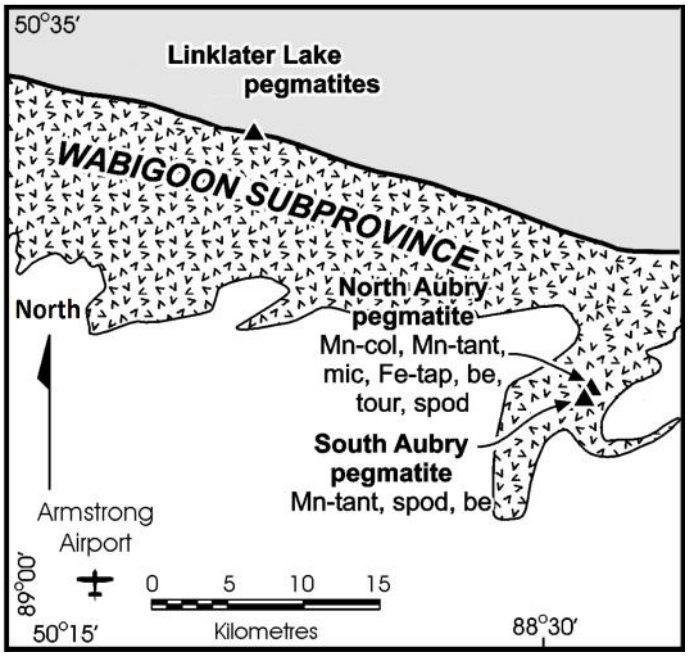


Figure 5. Location map of the North Aubry pegmatite. Map modified from Breaks, Selway and Tindle (2005, p. 116)

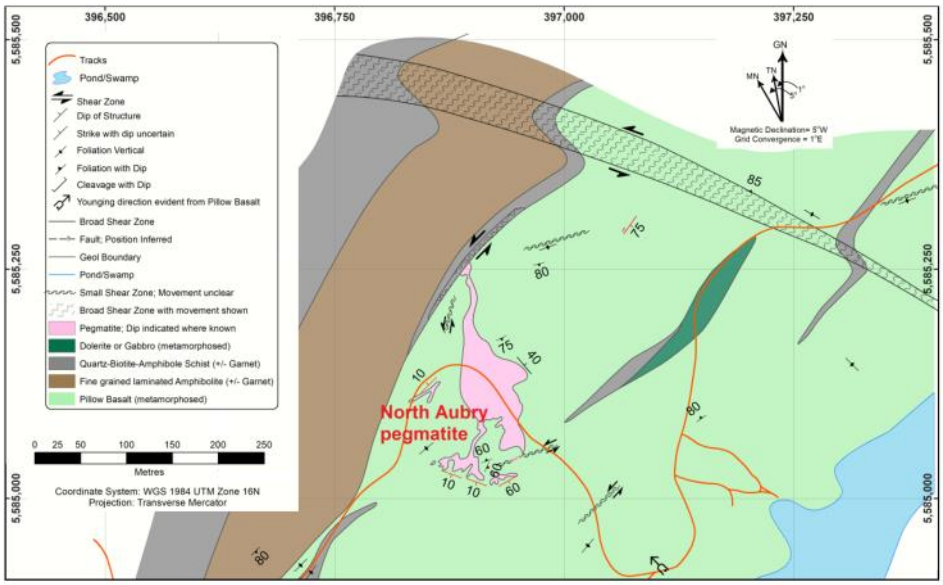


Figure 6. Detailed location map of the North Aubry pegmatite. Map adapted from Ardiden Corporation (2019, p. 10), with geology from Spitalny (2018).

Marko's pegmatite, Separation Lakes pegmatites, Ontario. The pegmatite is 15 x 190 meters in surface exposure (Blackburn et al. 2002, p. 115). "Pollucite , the only ore mineral for cesium, has been confirmed by X-ray diffraction at Marko's Pegmatite on the claim-group of Champion Bear Resources, where a single 3 by 4 cm crystal has been located in the beryl – muscovite – albite – quartz wall zone" (Breaks and Tindle 1997, p. 13). Also noted in Tindle et al. (2002).

Tot Lake pegmatite, Dryden pegmatite field, 5 km northeast of Gullwing Lake, Webb township, Ontario. "Pollucite is confined to a single 1 by 5 meter pod near the southwestern end of the dike [probably in trench 3] where it comprises 32 vol.% of the mode. The mineral occurs as coarse, anhedral to rarely subhedral, opaquely white, single crystals and more common anhedral masses that fill the interstices between a box-work of pink spodumene crystals. Recognition of pollucite is facilitated by a distinctive polygonal net-vein system composed of fine-grained albite, mauve lepidolite, calcite," (Breaks, Selway, and Tindle 2005, p. 112) and adularia. Single masses reach up to 20 cm (Breaks, Selway and Tindle 2005, p. 112; Breaks et al. 1985, p. 180). The first announcement of this discovery with a general location was by Mandarino and Harris (1965). An analysis of pollucite from the Tot Lake pegmatite is provided in Teertstra et al. (1998).

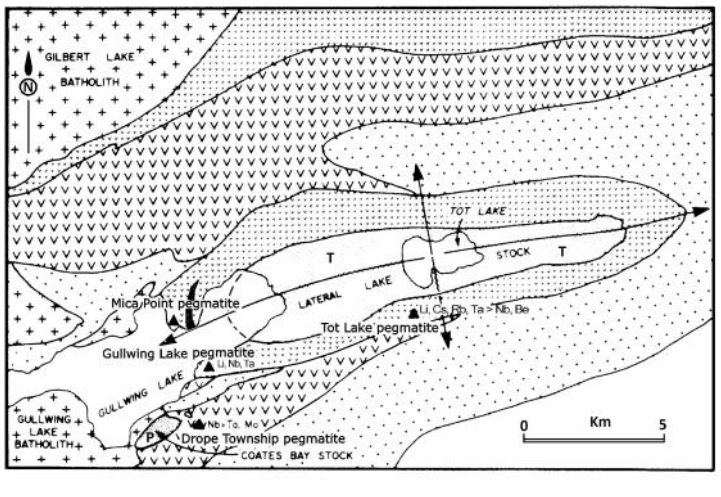


Figure 7. Geologic index map of the Tot Lake pegmatite area. Adapted from Breaks, Selway, and Tindle (2005, p. 110).

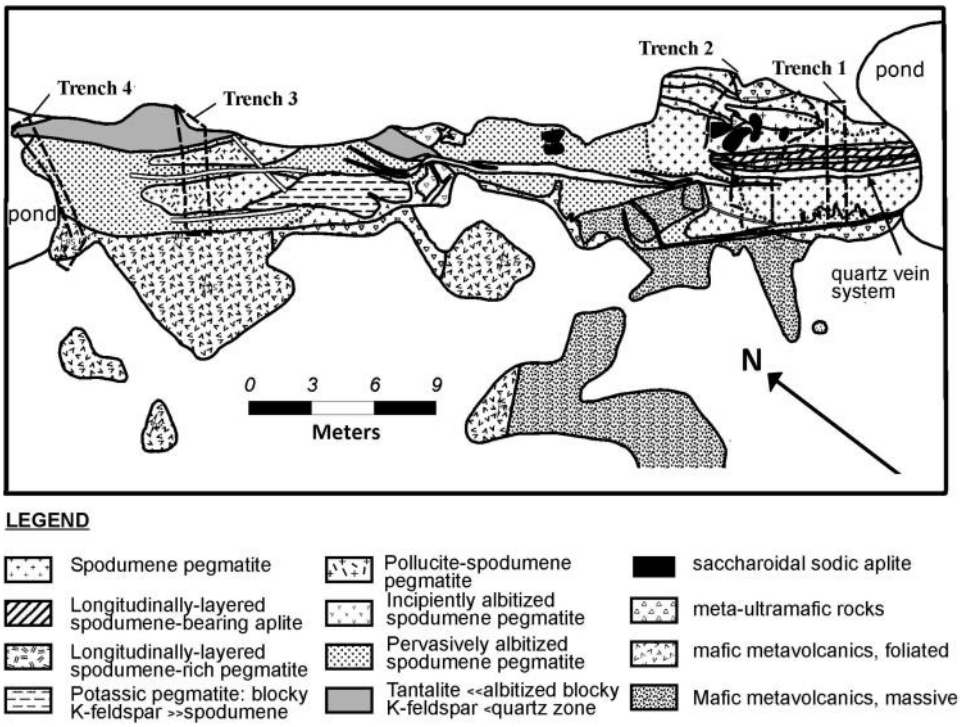
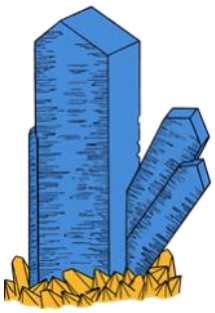


Figure 8. The Tot lake pegmatite with north to the lower right corner. Pollucite is found only at the western end , possibly in Trench 3 in the pollucite-spodumene zone. Adapted from Breaks, Selway and Tindle (2005, p. 113).

(Continued in next edition)

From Your Editor

I invite all chapters and anyone from the Members At-Large to either email me their chapter newsletters or a President's report each quarter.
I request that they be emailed since I can store them in one location and not have to search around the internet for every chapter that posts theirs. Just add me to your email list.
Beth Heesacker, heesacker@coho.net .
I also invite your pictures of your minerals to grace the pages of this newsletter.
Your articles and pictures can make this Bulletin a greater resource for mineral collectors around the world. Thank you in advance.



Interested in a wonderful resource for teaching children about minerals?
Check out the books and other resources at Diamond Dan Publications.
http://www.diamonddanpublications.net/

COLORADO CHAPTER UPDATE

http://friendsofmineralogycolorado.org/

Not much has occurred here over the last three months due to the COVID-19 restrictions. Going forward our chapter is hosting a series of video-based presentations by experts on minerals from around the world. We normally do not have meetings in the summer, but this year we a going to sponsor speakers once a month.

We may have to continue this remote lecture series in the fall as well since we normally meet at Colorado School of Mines and we do not know if they are going to let us meet there. Hopefully, we will hear something before September.

Assuming the COVID-19 pandemic has run its' course by next summer our chapter is working on a symposium covering Rare Earth Minerals. This will be put on late in the summer of 2021.

Not much exciting going on, but we are planning for the future. Being in Colorado we can still get out and collect individually or in social distance groups.

Stay Safe and Healthy, Bob Hembree, President

MIDWEST CHAPTER UPDATE

www.fommidwest.org

Fellow micromounters,

Sadly, after much deliberation, the **CMNH micromounters have decided to cancel their annual November symposium**. The best part of that event has always been the fellowship and the hunt for interesting new specimens – the part that is too hard to do virtually. We hope that things will be back on track for next year and that we will see you then.

Effects of Ultraviolet Light on Calcite formed in Amygdaloids and other Spaces in Basalt

by Calvin Harris

Introduction

The purpose of this essay is to describe observations regarding effects ultraviolet radiation has on calcite that has formed in basaltic amygdaloids and other spaces related to basaltic flow. Amygdaloids develop when gases escape extrusive igneous rock and form vesicles or small openings within the rock formation as it cools. The mineral that infills the amygdaloid openings is called an amygdule. When the flow of multiple basaltic forms called pillows intersect, open areas can become available. Features such as lava tubes are areas where mineralization can take place. Calcite forms as a secondary mineral from low temperature hydrothermal solutions (~100 degrees Celsius) or rain water that percolated through openings within the host rock. The cavities can also be infilled with quartz, chlorite and zeolites that form from low temperature hydrothermal solutions. The specimens pertaining to this essay originated from the following localities: Prescott, Arizona; Upper New Street Quarry (Burger's Quarry), Passic County, New Jersey; Eagle County, Colorado; Gopher Valley Quarry, Yamhill County, Oregon.

Specimen Description

The specimen from Prescott, Arizona consists of amygdules in basalt. This specimen is disk shaped with a 15 cm circumference; it has a thickness of 5 cm and has a weathered appearance. The calcite consists as large grains up to several centimeters in length and width, appears white under daylight conditions and is disseminated on the obverse (bulging) and reverse (flat) areas of the rock.

Prescott Arizona - Daylight

The sample collected from Upper New Street Quarry (Burger's Quarry) is a combination of calcite crystals with minor amounts of the zeolites, pumpellyite and natrolite on a basalt matrix and likely formed within a cavity. The calcite crystals are simple rhombohedra and are approximately 3 mm x 4 mm in size and appear white when viewed in daylight. The matrix of this specimen was sawn and is wedge shaped; it measures 8 cm x 5 cm x 2 cm.

Eagle County Colorado - Daylight

The specimen from Eagle County, Colorado consists of rhombohedral calcite crystals inside a pocket within basalt. The crystals appear light tan in daylight and are approximately 0.5 cm in size. The shape of this pocket is irregular and is about 5 cm. x 5 cm. x 3 cm in depth. Overall, the specimen is approximately 10 cm x 8 cm x 5 cm and features openings indicative of gas escaping the basalt as it cooled. The reverse side of this specimen clearly exhibits amygdales and amygdaloidal features.

The sample from Gopher Valley Quarry consisting of simple rhombohedral calcite crystals perched on a basalt matrix; the crystals have a butterscotch color in daylight. Small open spaces on the matrix's surface highly suggest that gases escaped the basalt during cooling. The calcite crystals are simple rhombohedra and the largest is 4 cm x 3 cm x 1 cm. This specimen is roughly disk shaped with a 13 cm diameter and a thickness of 5 cm.

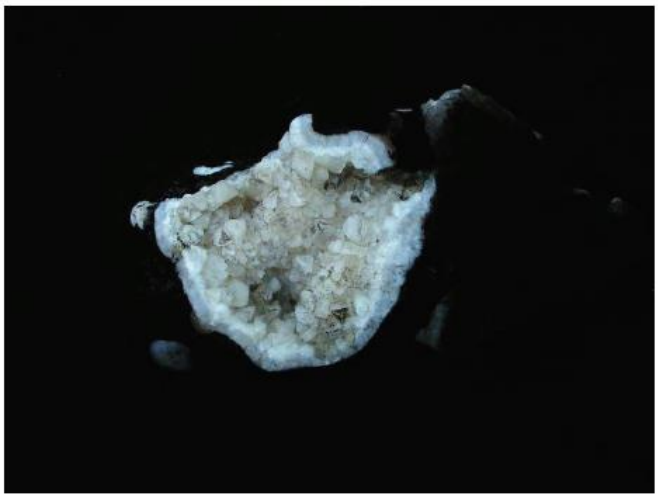
Test Procedures

An individual specimen was placed approximately one inch from each ultraviolet source to evaluate the color and intensity of fluorescence and phosphorescence. At least a five second exposure time was used to determine phosphorescent color during its peak duration; exposure time and the duration of phosphorescence was also noted.

The conventional ultraviolet sources used include three, SuperBright II lamps and one SuperBright III unit. These are portable units that operate using AC and DC electric sources. The lamps emit wavelengths 254nm (short-wave), 312nm (mid-wave), 351nm (long-wave) and 370nm (long-wave) respectfully. A lead-acid battery was used to supply electric current. This equipment is manufactured by UV SYSTEMS, INC., which is based in Renton, Washington.

A Vivitar 283 battery powered photographic flash unit was employed as a means to produce a momentary, vivid phosphorescent effect colloquially known as *flash.* The specific ultraviolet wavelength of this unit has not been determined; however, when used at its maximum output setting, it can evoke a red-orange response in calcite, which is likely due to the presence of manganese as an activator. This reaction compares favorably to the red-orange response gained when using conventional sources of ultraviolet radiation. Interestingly, this tool has the ability to evoke *flash* in some calcite specimens while conventional UV sources could not produce this result. The Vivitar 283 also has the capability to stimulate phosphorescence and for many years spelunkers have observed this effect when photographing speleothems using similar lighting devices. Speleothems cave formations that are typically composed of calcite or its polymorph aragonite.

Prescott, Arizona Shortwave UV



Eagle County Colrado Shortwave UV

Test Results from Ultraviolet Radiation Exposure

(Abbreviations: fl = fluorescence; phos = phosphorescence; exp. = exposure; sec. = seconds)

Specimen identification	Prescott, Arizona	Street Quarry (Burger's Quarry)	Eagle County, Colorado	Gopher Valley Quarry
Short-wave (254nm)	**fl**: white w/blue tint, moderate intensity; **phos**: greenish-white w/25 sec. exp., 5 sec. duration; weak intensity.	**fl, phos** white w/green tint, moderate intensity. **phos**: 10 sec. exp., 5 sec. duration.	**fl**: cream w/blue tint; moderate/bright intensity. **phos**: moderate/bright blue w/5 sec. exp, 11 sec. duration.	**fl**: white w/blue-green tint; bright intensity. **phos**: color similar to fl after 5 sec. exp; moderate intensity; 9-10 sec. duration.
Mid-wave (312nm)	**fl**: color shift toward green, moderate intensity. **phos**: bluish-white w/25 sec. exp., 5 sec duration, very weak intensity.	**fl, phos**: same colors, but, more vivid than short-wave; moderate intensity. **phos**: 10 sec. exp., 5 sec. duration.	**fl**: white w/yellow-green tint; bright intensity. **phos**: lime green w/ 5 sec. exp, 13 sec. duration, moderate intensity.	**fl**: color toward green w/greater intensity than short-wave; **phos**: response similar to short-wave.
Long-wave (351nm)	**fl**: Less bright and slightly greener than mid-wave. **phos**: very weak intensity, color un-determinable w/25 sec. exp., 2 sec duration.	**fl**: similar color to short-wave, moderate intensity. **phos**: greenish-white w/10 sec. exp., 3 sec., duration, moderate intensity.	**fl**: cream, moderate intensity. **phos**: lime w/10 sec. exp, 10 sec. duration; moderate intensity.	**fl, phos** similar to mid-wave; **phos**: 9 sec. duration.
Long-wave (370nm)	**fl**: exhibits cream w/bluish tint, moderate intensity. **phos**: greenish-white, very weak intensity w/ 25 sec. exp., 2 sec duration.	**fl**: white w/greenish tint moderate intensity; **phos**: white w/10 sec. exp., 2-3 sec. duration; very weak intensity.	**fl**: white w/ cream tint, moderate/bright intensity. **phos**: lime w/ 10 sec exp., 10 sec duration, moderate/dim intensity.	**fl**: moderate-bright, lemon-yellow; **phos**: moderate-bright white color after 5 sec exp. duration: 9 sec.

Photographic strobe **(phosphorescence)**	No effect.	Creamy-red ***flash***; bright intensity, 1 sec., duration.	Cream color ***flash***, moderate/ bright intensity, 2-3 sec., duration.	Bright lime-green **phos**, 6 sec. duration.

Discussion

The various dimensions of open spaces related to mineral infiltration of the host rock does not appear to have any significant luminescent outcome among the samples evaluated. The fluorescent responses were pastel colors and intensity that were closely related. Longer wavelengths produced a shift from a blue to a green chromatic response. The phosphorescent responses were more varied regarding the amount of exposure time needed for assessment, as well as, intensity and duration. Regarding *flash*, the results were distinct or nonexistent.

The test results from the conventional sources of ultraviolet radiation approximate results attributed to organic activators associated with calcite. These activators cause a whitish and pastel fluorescent and phosphorescent response to different ultraviolet wavelengths. The *flash* caused by the photographic flash unit suggests that manganese is present, which functions as an inorganic activator. However, specialized equipment such as a high resolution Raman spectrophotometer can provide the means to identify the activators with certainty.

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MISSISSIPPI VALLEY CHAPTER UPDATE

Your Report could be here!
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NEW JERSEY CHAPTER UPDATE

https://fomnj.wordpress.com/

Your Report could be here!

PACIFIC NORTHWEST CHAPTER UPDATE

www.pnwfm.org

PNWFM President's Message:

Greetings all from Toby Seim,

I hope everyone is of good health. Normally I would have more to say but I acknowledge and understand that this time is and has been really taxing on many of our members. I have been lucky enough to partake in some field collecting this last month and it has really brightened my spirits. I hope that some of you have been able to do the same.

The virtual Symposium being held in October is right around the corner. We have a diverse group of speakers this year who will be touching on some new and exciting topics. We will be communicating more details soon in relation to how the event will role out. COVID-19 has given us the push to finally record our talks this year which will help educate the mineral community in the future. I'm hopeful to continue to record our talks for reference going forward. I am looking forward to this event and reconnecting with all of you.

(For information about the virtual PNWFM Symposium check out the PNWFM Newsletter:

http://pnwfm.org/wp-content/uploads/bsk-pdf-manager/2020/09/PNWFM_Newsletter_2020-09.pdf)

PENNSYLVANIA CHAPTER UPDATE

www.rasloto.com/FM/

JOIN US FOR THIS VIRTUAL LIVE EVENT!

Pennsylvania Chapter Plans
November 7 Virtual Symposium and
November 8 Field Trip

Friends of Mineralogy-Pennsylvania Chapter will hold its annual symposium for mineral collectors on Saturday, November 7, 2020, as a live virtual event from 9:00 a.m. to 2:30 p.m., subject to change. An in-person field collecting trip is planned for Sunday, November 8. The online symposium will include several virtual live presentations of interest to Pennsylvania mineral collectors, with audience questions and answers.

The Symposium will be available to FM-PA Chapter 2020 members who **register in advance**. Non-members may pay for 2021 membership by October 26 and receive membership for the remainder of 2020, including the Symposium and Field Trip, as a bonus. See <http://www.rasloto.com/FM/> for membership application, symposium details, and registration form as they become available.

Call for Symposium Presentations

Friends of Mineralogy - Pennsylvania Chapter invites submission of abstracts for virtual live presentation at our annual symposium. It will be a Zoom meeting taking place on Saturday, November 7, 2020 (and an in-person field collecting trip planned for Sunday, November 8). Presentations on Pennsylvania minerals or mineral localities, or other topics of interest to collectors, are invited. We provide an honorarium of $100 for each 40 minute presentation.

Short abstracts may be submitted to Chapter President Joseph Marchesani <jmarch06@comcast.net> by October 12 to be considered for acceptance as Symposium presentations. Upon acceptance, final abstracts for inclusion in the Symposium Program are required by October 26. These may be up to two pages and may include illustrations of sufficient resolution to look good in print; a biographical sketch and photograph of the author are also welcome.

Accepted speakers should be prepared to make their virtual live presentations and answer audience questions via Zoom in a scheduled time slot on November 7. It is expected that most of these will be PowerPoint presentations with live narration via Zoom shared screen. FM-PA plans to have preparatory "dry run" test session(s) in advance. FM-PA may make the presentations available for a limited time following the symposium.

Short Mineral Collecting Videos Requested

Short (5-10 minute) videos of mineral collecting sites and/or recent collecting activities and resulting specimens may be submitted by October 26 for possible inclusion in the Symposium. Contact Bill Stephens <bstephens@stephensenv.com> for instructions on submission.

SOUTHERN CALIFORNIA CHAPTER UPDATE

Your Report could be here!

VIRGINIA CHAPTER UPDATE

Dear National Members,

It has been two months since our official announcement of a new FM chapter in Virginia. Despite COVID-19, we have been hard at work laying the foundation for FMVA and building our chapter up (we currently have 30 members!).
Since our last update, we have incorporated our chapter in Virginia and are currently filing our nonprofit status paperwork for the IRS. We have held over ten business meetings and two official chapter meetings since May. Our bylaws, operating procedures, website, logo, social media, etc. are all up and ready!

Due to popular demand and the gap in community services during COVID-19, we will host monthly meetings for our members. We have filled up our speaking spots for this year and are currently adding to next year already! If you want to be a speaker, we would love to have you! Our upcoming meetings, held on the last Friday of the month, are open to all FM members and we would love to see you there!

We have also been working on developing resources to help increase awareness and access to virtual platforms, through the creation of a Zoom assistance document. This has been shared to all local clubs in our state and has even been used by some chapters across the coast.

Our talented team has been hard at work to make sure that COVID-19 does not stop our progress, rather it builds our chapter as a strong community partner for the schools, clubs, and museums in our state. We continue to network and reach out to our local stakeholders to build alliances and find ways we can help them during these difficult times.

Looking forward to 2021, our chapter will continue monthly meetings and will be hard at work with several programs and initiatives to support and become a resource for clubs, not just a local FM chapter. We believe that through social media, virtual programs, and community collaboration, FMVA will bring forward the mission of FM to those across the state.

It can be difficult during COVID to provide the same community and access we are used to, but FMVA is dedicated to making sure the quality of work and programming continues during these times when our fellow collectors need us the most.

As with our last update, we extend an invitation to all FM chapters and leadership to meet with our team and work together for new and exciting projects in the coming months. We are proud to have a diverse group, with many up and coming young mineral collectors. Find out more about our initiatives and chapter on our website: www.friendsofmineralogyvirginia.org

Event Invitations:
September 25th- Leah Luten "Mineral Art" ZOOM LINK
October 30th- Community Mindat Workshop ZOOM LINK

Thomas N. Hale (President of FMVA) Em: virginiamineralproject@gmail.com
Alex Venzke (Vice-President of FMVA) Em: alex.venzke27@gmail.com

NATIONAL MEMBERS "AT-LARGE"

Your Report could be here!

Would someone like to speak up for the "at-large" members?
Needs, wants, comments?

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FM AFFILIATES

The Friends of Mineralogy is a long-time affiliate of The Mineralogical Record magazine. The magazine was founded in 1970 by John White, who was at that time a curator in the Mineral Sciences Department of the Smithsonian Institution. With the initial help of a financial backer, Arthur Montgomery, White succeeded in launching and bootstrapping the fledgling publication to the point where it was marginally self-sustaining. After seven years as editor and publisher, White stepped aside for a new Editor, Wendell Wilson.

Since then the Mineralogical Record has grown steadily in size, quality and prominence, thanks to the contributions of over 700 authors, photographers, artists, advertisers and donors. It has become a collective labor of love on the part of the entire mineralogical community worldwide. It is the only journal to have a new mineral species named in its honor (minrecordite), and it is the only journal to have received the Carnegie Mineralogical Award. Subscriptions, back issues, books and a variety of free databases are available online at www .Mineralogical Record .com.

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Mineral News
The Mineral Collector's Newsletter