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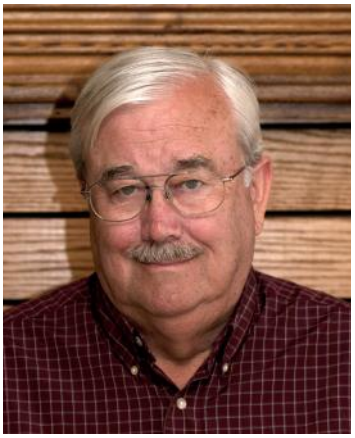
to promote, support, protect and expand the collection of mineral specimens and to further the recognition of the scientific, economic and aesthetic value of minerals and collecting mineral specimens.

Inside This Issue



President's Message
By William W. Besse

This year has been a turbulent one for all. Hopefully, next year will put us on track towards normalcy though not likely till the latter half of 2021.

As this is the end of the year, we are faced with elections for members to the Board of Directors. Information regarding the election appear separately in this Bulletin. I will say that it is pleasant that we already have four members willing to be officers as a new Executive Committee that will be selected at the Board meeting in February. These are: Mark Ivan Jacobson, President; Alexander Schauss, Vice President; Linda Smith, Secretary; Bruce W. Bridenbecker, Treasurer. I would like to thank Chris Whitney-Smith and Jolyon Ralph, who decided not to run for reelection to the Board, for their service to Friends of Mineralogy. Please vote in the upcoming election.

The Board of Directors meeting will be held virtually this coming February, 13th at 9:00 a.m. MST via ZOOM. The reason for virtual versus a live meeting is the result of show cancellations this coming January and February in Tucson due to the pandemic. Most shows have voluntarily cancelled and the rest are expecting to be cancelled by the city of Tucson. So a virtual meeting is the only alternative. If there are changes to Directors representing the chapters they need to email me so that they will get an invite to the meeting. All FM members may get an invitation to the Board meeting by emailing me as well.

If you have any agenda items for the Board meeting, please get them to me before the meeting date.

The Awards Committee, headed by FM Vice President Alexander Schauss, is working on the selection of Best Articles as usual, but with no TGMS Show there will be no be a banquet for presentation of the awards. I am working on a virtual presentation of the awards. Hopefully that will come to fruition.

I wish all happy holidays and a more prosperous New Year.

Go dig a rock (for real or virtually)!

NATIONAL OFFICERS

PRESIDENT: William Besse; wwbesse@gmail.com
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EDITOR: Beth Heesacker; 4145 NW Heesacker Rd., Forest Grove, OR 97116, heesacker@coho.net

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MINERALOGICAL SOCIETY OF AMERICA: Alex Speer; jaspeer@minsocam.org
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***MINERAL NEWS:* Tony Nikischer;** tony@excaliburmineral.com

FM Board of Directors Meeting

February, 13th at 9:00 a.m. MST via ZOOM

Current Directors will be invited by email.
If there are changes to Chapter Directors, please email President William Besse

All FM members may get an invitation to the Board meeting by emailing President Besse and letting him know.

wwbesse@gmail.com

Friends of Mineralogy National Board Election

The annual Friends of Mineralogy National Board election selects **four** candidates to serve a three-year term as Board Directors on the National Board. Voting is conducted through popular vote by the national membership. For the election of 2021, Erin Delventhal will be tabulating results and presenting results to the National Board at the annual board meeting.

By requirement of the Friends of Mineralogy National by-laws, four two-year executive Director positions (**President, Vice President, Secretary, and Treasurer**) **must** be filled from officers of the Board of Directors during the annual meeting of the Board. Nominations from the floor are accepted.

During the upcoming year (2021), the open positions that **require** a new candidate to be appointed are: **President, Treasurer**.

The positions that standing Board Directors are willing to continue in: **Vice President** (Alex Schauss), **Secretary** (Linda Smith).

Standing Board Directors willing to serve in a position are: Mark Jacobson (**President**). By this current tally, positions that **must** be filled from newly elected Board Directors are: **Treasurer.**

All executive Director positions are open for multiple candidates to run. If more than one candidate for an office is presented, a written ballot shall be used.

Voting to select the candidates for these four Director positions is conducted by the standing 12 board directors as well as the Directors nominated by each individual chapter to represent their respective chapter.

As a member of the Friends of Mineralogy, you are encouraged to vote! You may cast your vote in one of the two following ways:

1) submit your candidate choices (4) by e-mail to friendsofmineralogy@gmail.com
2) submit your candidate choices (4) by physical mail to
Friends of Mineralogy
La Fuente de Piedras
1735 N. Oracle Road
Tucson, AZ 85705

Votes must be received by/postmarked by February 7th, 2021.

The candidates running for Director positions this year are as follows:

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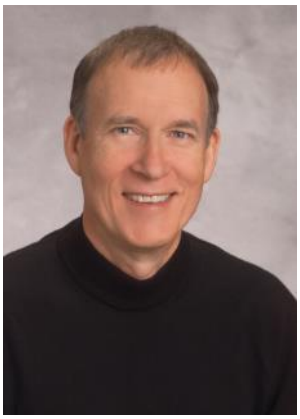


Alexander Schauss, PhD

Alex's interest in mineralogy began at the age of eight when he took a specimen he and a friend found in New York's Central Park to the American Museum of Natural History. That began an eight-year history helping Fredrick Pough, PhD, or "Freddy", the then-Head of the Department of Geology and Mineralogy, performing various curatorial functions, that included handling thousands of specimens. Encouraged by Dr. Pough, he gave up a scholarship opportunity to study metallurgy at Brown University, and instead headed to the "frontier" to attend the University of New Mexico in Albuquerque, where he earned his undergraduate and graduate degrees, and to collect specimens at numerous sites around the state and southeastern Arizona, including the famed Kelly mine. Studying in Albuquerque brought him within a reasonable proximity to Tucson, a city he would visit for the rest of his life starting in 1967 to attend the Tucson Gem and Mineral Show® and satellite shows, eventually serving as a TGMS quality judge, a volunteer task he has performed for several decades.

His thumbnail mineral collection has won a dozen AFMS master awards, The Richard Pearl Trophy for Best Mineral at the Denver Gem and Mineral Show, TGMS's McDole Trophy and Paul Desautels Trophy, and in more recent years exposed an increasing number of collectors to thumbnail mineral collecting around the country and through such events as the 2012 Munich Gem and Mineral Show, which featured thumbnails for the first time in that show's 50-year history, in coordination with another noted thumbnail collector and former Friends of Mineralogy board member, Jim Houran.

Alex is a decades long member of Friends of Mineralogy, and past-President, and its current Vice President. He is also a member of the: Tucson Gem and Mineral Society; the Pinal Gem and Mineral Society; the Flagg Mineral Foundation; the Arizona Geological Society; Life-member of the Mineralogical Society of Arizona; and a Trustee of the Arizona-Sonora Desert Museum. He has published articles in *Rocks & Minerals*, and *Mineral Monographs*, and wrote the book, *Minerals, Trace Elements, and Human Health*, including all four editions. He and his wife, Laura, also a member of Friends of Mineralogy, and who collects fluorites, are Fellows of *The Mineralogical Record*.

In 2015-2017, Alex successfully lead the campaign to have the mineral wulfenite become the official state mineral of Arizona, and worked for many years to help establish the new University of Arizona Alfie Norville Gem and Mineral Museum in downtown Tucson that will open in early 2021, as Vice President of the museum's advisory board.

Alfredo Petrov

Alfredo is a bit of a vagabond who dissipated his youth in England, Germany, Lebanon, and Ethiopia, and then got slightly more serious about life and came to the USA to study geology in San Diego. During his student years he worked part time in the mineral department of the San Diego Natural History Museum, where he was inspired by then curator Dr. Russ MacFall to collect micromounts, a passion that continues.

After graduation, he worked for four years as editor of research papers at various universities in Japan and then, just like Butch Cassidy and the Sundance Kid, Alfredo discovered that Bolivia was the perfect place to hide away from societies with lots of rules. Having escaped to that remote country, he spent a few years working on geological research and ecology projects, playing impoverished organic farmer, and growing his micromount collection, until one day he fell under the dubious influence of an itinerant California mineral dealer with the unlikely name of Rock Currier, under whose expert tutelage Alfredo learned to eke out a living crawling around miser

able dirty rat holes in South America's steaming jungles and freezing peaks, collecting stones to feed the insatiable cravings of northern hemisphere crystal addicts.

After twelve years in Bolivia, he moved back to the USA to spy on American mineral collectors in an attempt to discover what it is they actually DO with all those ugly and peculiar rocks he had been foisting on them over the years. He supports himself during this ongoing quest by working for his late mentor Rock Currier's company Jewel Tunnel, selling minerals at shows mostly in Japan and Europe, translating mineralogical literature into English, guiding other foolhardy collectors to places where they can energetically dig up crystals with their own eager grubby fingers, along with unpaid volunteer activities like being on the management team of Mindat.org ever since its public launch 20 years ago, and a member of its board of directors aka the Hudson Institute of Mineralogy, and publishing numerous articles for mineral collectors in various North American and European journals. He dreams of internationalizing the activities of the Friends of Mineralogy, creating partnerships with like-minded organizations abroad for mutual benefit.

Alex Venzke

I am a 25-year-old mineral collector from the Washington, D.C. area who has been seriously collecting minerals for almost 5 years now, but I've had a "collection" and been picking up rocks since I was a young child. I graduated from Beloit College in Wisconsin in 2017 with a BSc in Geology and a BA in History.

Over the past few years, I've gotten reasonably involved within the mineral community. I am a member of the Northern Virginia Mineral Club, Mineralogical Society of the District of Columbia, and the Geological Society of Washington. I am also a part of the leadership team of the Young Mineral Collectors group, a member of the mindat.org management team, and the co-founder, current Vice President, and a charter member of the Friends of Mineralogy Virginia Chapter.

With the challenges faced in 2020, Thomas and I knew that forming a new FM chapter would be the perfect opportunity to show the mineral community how young collectors could give back and engage in a large state-wide project. We have taken a new approach in FMVA to not only accommodate the challenges of 2020 but also to increase accessibility by conducting meetings virtually and organizing featured speakers from among the national community to present at meetings. I would love to have the opportunity to expand my involvement in the national mineral community and running for a position on the FM national board is the next step to continue collaboration and engagement.

Bruce W. Bridenbecker

Upon graduating with a B.S. in Geology from Northern Arizona University in 1979 I worked as a Senior Geophysicist for Cities Service Company at offices in Tulsa, Denver, and Bakersfield from 1980-1988. After leaving Cities Service Company, I went into education and taught Earth and Physical Science at the secondary level (K-12) until July 2000. During that time, I earned an M.S. in Geoscience from Mississippi State University and an M.A. in Environmental Education from California State University San Bernardino. I began working at Copper Mountain Community College in the Fall of 2000. I presently serve as the Division Chair for Math and Science and as a tenured Professor of Earth and Physical Science at Copper Mountain Community College, Joshua Tree, CA.

I have been a member of Southern California Chapter Friends of Mineralogy since 2003, a SCFM board member since 2006, and its treasurer since 2010. I have served one term on the Friends of Mineralogy National Board and would like to be considered for reelection. If elected, I would be available to serve as Treasurer for FM.

Greetings from the *Mineralogical Society of America* (MSA) Liaison to the *Friends of Mineralogy* (FM)

Please let me introduce myself and explain my role as liaison. I am Dr. Ken Bladh, Emeritus Professor of Geology, Wittenberg University, Springfield, Ohio. I currently serve as Editor of the MSA online *Handbook of Mineralogy* and am a current member and past president of the Midwest Chapter of Friends of Mineralogy. Allow me to put a face to my name with this photo at the FM Midwest Chapter table at the 2018 *Greater Detroit Gem, Mineral*, Fossil and Jewelry *Show*. It was a treat for the group of FM volunteers that weekend to greet the public of all ages and share our passion for minerals.

My history with FM and MSA begins in the early 1970s while a graduate student at the University of Arizona. Then and over the years since, I experienced many joint FM-MSA public symposia for mineral enthusiasts associated with the *Tucson Gem & Mineral Show*. There were even some jointly sponsored fieldtrips to famous Arizona mineral localities back then. Both types of activity encouraged professionals and amateurs to interact and share their knowledge of and enthusiasm for minerals. During my time at the U of A, I was fortunate also to learn how to field collect, prepare and mount microminerals from Dr. Art Roe and similarly focused members of the *Tucson Gem & Mineral Society*. I still enjoy this professionally relevant aspect of the mineral collecting hobby and often use photographs of my specimens to illustrate talks to regional mineral clubs.

As liaison between these two minerals organizations (FM & MSA), I hope to sustain communication and interactions that advance the interests of each group. For example, as *Handbook* editor, I summarize new mineral descriptions to one page of essential information that defines each mineral species. Many of these descriptions include stories about the regional collectors and/or mineral dealers who have noticed an unusual crystal and were willing to bring it to the attention of a professional mineralogist or museum curator with the analytical tools to identify the “unknown” or confirm that the sample is new to science and worthy of the expensive analyses that are required to characterize fully any mineral species. Please offer suggestions as to how MSA can foster and support these types of exchanges. Another important type of communication between members of our organizations are the non-technical public talks that many professional mineralogists associated with universities or museums and

advanced amateur enthusiasts offer at club meetings and sponsored mineral symposia. Over time, important relationships and two-way channels of mineralogical information develop in these settings.

To the members of FM around the USA:

Do you have a mineral professional in your region who accepts unsolicited specimens for examination as potential new species? If you share their names with me, I will contact them and find out how MSA might assist their continued participation in this type of outreach to the broad mineral enthusiast community without being a burden. Most regional mineral shows offer a free ID table for show attendees that can usually provide adequate identification of unknowns. What I have in mind is a pathway for the uncommon unknown that might already have stumped the simple tests available at an ID table. If you don't know of a person in your region to approach with unusual mineral specimens, I would like to assist in making that connection on your behalf.

Have you been following the *Mineral Talks LIVE* interviews (Zoom webinars available on *YouTube*)? The variety of backgrounds represented by the speakers is impressive. Do you have suggestions for future topics or speakers?

Would you send me a contact person at a mineral show in your region that might accept an ID specialist from a nearby museum or university to examine unusual unknowns? I might be able to serve as facilitator for that service.

Would you nominate an MSA member or other professional that has demonstrated the interest and ability to communicate their mineral-related knowledge to an informed public audience? I would be happy to compile the recommendations and share them with permission of the individual nominated.

And generally – is there anything that you can think of that MSA members can bring to FM activities that foster our shared goal to advance mineralogic science at all levels? Send me a note to kbladh@wittenberg.edu – I will respond.

To the members of MSA:

Would some of you allow me to share your contact information with knowledgeable collectors in your region who have a specimen that defies identification?

Do you have interests in topical mineralogy that might not be your research specialty but would be of interest to a general audience of mineral enthusiasts? Before Covid-19, there were mineral symposia in each region of the USA that attracted a healthy mix of mineral professionals and amateurs as presenters and members of the audience. I would be happy to help publicize future symposia among MSA members and students at nearby universities with MSA or FM members.

Have you been following the *Mineral Talks LIVE* interviews (Zoom webinars available on YouTube)? The variety of backgrounds represented by the speakers is impressive. Do you have suggestions for future topics or speakers?

And generally – is there anything that you can think of that FM members can bring to MSA activities that foster our shared goal to advance mineralogic science at all levels? Send me a note to kbladh@wittenberg.edu – I will respond.

A Comparison of Luminescent Properties between Certain Terlingua Calcite Specimens from Little 38 Mine

by, Calvin Harris

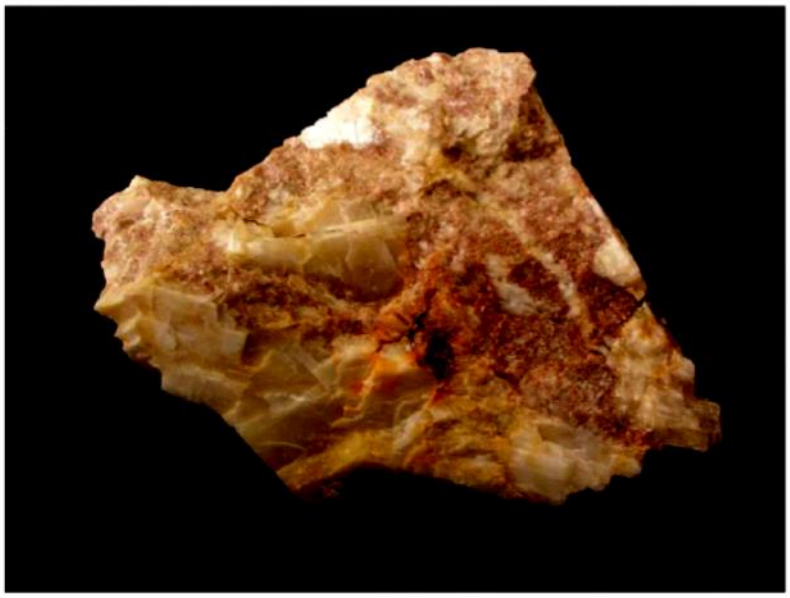
Introduction

The intent of this essay is to highlight the luminescent properties of a Terlingua calcite specimen from the Little 38 mine that is different from other specimens I acquired from this location. These acquired specimens have a distinct pink coloration under daylight conditions and exhibit the familiar, but unusual multi-color responses to ultraviolet radiation. The responses include blue fluorescence and pink phosphorescence under shortwave ultraviolet radiation. Additionally, pink fluorescent and a blue or bluish-white phosphorescent reaction is produced by longwave ultraviolet radiation. However, the fluorescence and phosphorescence of the principal specimen is more varied and unanticipated.

Geological Setting

The Little 38 mine is located in the Terlingua District, Texas. This district is situated within Cretaceous and Tertiary age marine sedimentary rock that was intruded by Tertiary age lavas and bypabyssal rocks. The sedimentary rocks consist of limestone and clay. Intrusive rocks are in the form of dikes, sills, laccoliths and plugs. These forms range in composition from rhyolites to basalt. Calcite deposition is found within fracture openings in all deposits and as amygdules in volcanic and intrusive rocks.

The Terlingua District is the type location for calcite exhibiting the unusual multi-color responses to ultraviolet light.



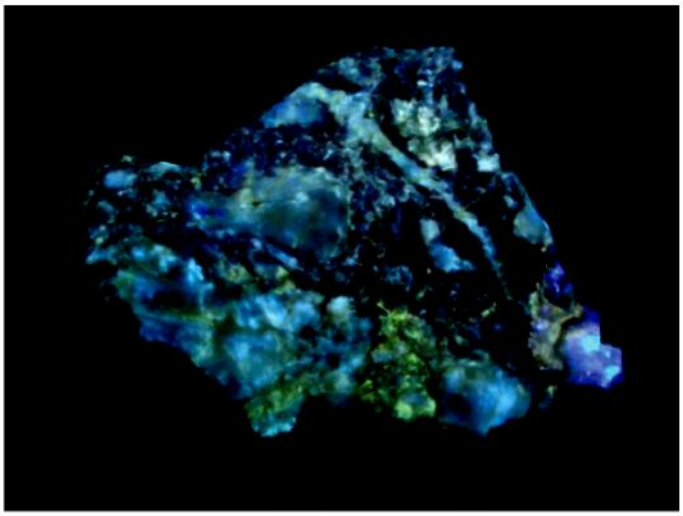
Principal Specimen - Daylight

Description of Specimens

The principal sample is a wedged shaped, large cabinet specimen measuring 14.3cm x 8cm x 10.2cm. Under daylight conditions, it consists of light brown massive calcite and pale, butter-yellow rhombohedral cleavage forms that are well developed. The daylight coloration is attributed to bituminous or petroleum - based compounds in various concentrations.

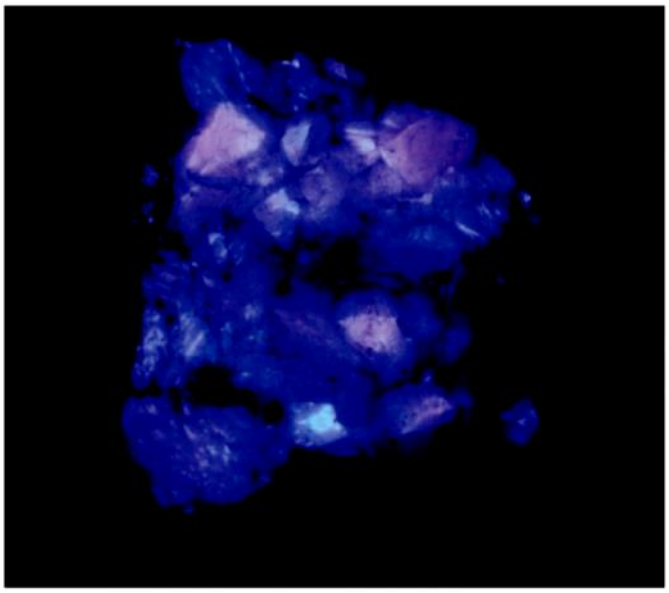
Three samples were used as models to compare luminescent characteristics. They are hand-sized specimens and measure between 10cm x 7.5 cm x 4.7 cm to 11 cm x 10cm x 7.2cm.

They have similar pink coloration with cleaved rhombohedra surfaces that are moderately developed. The pink coloration is likely due to certain manganese compounds.



Principal Specimen - SWUV

Model Specimen - Daylight



Model Specimen - SWUV

Methods and Procedures

Although mineralogical references describe the reactions to shortwave and longwave radiation, this essay will expand this information by including emissions from recently developed sources that emit mid-wave and longwave wavelength radiation. Also, the information gained from a method used to produce *flash* or intense phosphorescence of brief duration, will be offered.

Fluorescence, phosphorescence and *flash* were evaluated using include four sources of ultraviolet radiation. Among these sources are three, SuperBright II lamps. These lamps emit wavelengths 254nm (shortwave), 312nm (mid-wave) and 351nm (longwave). Additionally, a SuperBright III lamp that emits a longwave wavelength of 370nm was also used. A lead-acid battery was used to operate these lamps. This equipment was manufactured by UV SYSTEMS, INC., which is based in Renton, Washington. The distance between each specimen and radiation source was approximately 3-4 inches. Exposure and response times regarding fluorescence and phosphorescence were estimated. *Flash* was determined by quickly passing each light source across the specimen.

The evaluation of *flash* was also affected by using an unusual, but effective source of ultraviolet radiation, namely a Vivitar 283 photographic flash unit. Best results occur when this device is used at its maximum output setting. Once the specimen is placed in a fixed position, the flash unit is held steadily 3-4 inches from the specimen then discharged. One's eyes must be closed during the bright emission and then *flash* can be observed once visible light has dissipated. Possible damage to the flash unit and specimen are avoided by the fixed placement of these items. Alkaline batteries were used to operate this device.

Effects of Ultraviolet Radiation on the Principal Specimen

Shortwave (254nm): The light brown section displayed brown and tan fluorescent coloration with moderate intensity. The butter-yellow section displayed blue and bluish-tan fluorescent colors with bright and moderate intensity, respectfully.

The phosphorescent responses were numerous. A chocolate brown color with moderate intensity was viewed in the light brown section and brown, tan and blue colors were observed in the butter-yellow section.

The duration of phosphoresce was not evenly dispersed and lasted between 7 and 10 seconds. The blue response was located on one small section of the specimen and lasted 10 seconds. The areas further from this section displayed progressively shorter duration times. The intensity of phosphorescence was moderate.

No *flash* was apparent.

Mid-wave (312nm): The light tan area effected by the radiation displayed a chocolate-brown, bright intensity, fluorescent response. The butter-yellow area displayed a brown, tan, cream with greenish tint and blue coloration; overall, the intensity was bright.

A 10-second exposure produced phosphorescent responses similar to the fluorescent results regarding the light tan and butter-yellow areas, except the intensity was moderate. In both sections of the specimen, a moderately low intensity, blue response developed as the phosphorescence dissipated; the phosphorescence lasted 13 seconds.

No *flash* was discernable.

Longwave (351nm): This wavelength produced a chocolate-brown fluorescent effect with medium intensity in the tan area of the specimen. The phosphorescent effect had a similar color to fluorescence except a medium-low intensity. In both sections of the specimen, a bluish-cast was observed as phosphorescence diminished.

The butter-yellow area displayed fluorescence characterized by brown, cream and pink coloration with medium intensity.

The phosphorescent coloration was similar to fluorescence, except for medium-low intensity and a bluish cast followed as phosphorescence diminished. In addition, no pink coloration was observed. Overall, a 10-second exposure yielded a duration of 7 seconds.

No *flash* was evident.

Longwave (370nm): The fluorescence produced in the tan section was a chocolate-brown color with moderate intensity. The phosphorescence appeared to have similar coloration compared to fluorescence, but the intensity of this response was low. A 10-second exposure time generated a 4-second duration.

This wavelength produced a tan, brown, cream and pink fluorescent response in the butter-yellow section; the intensity of the response was moderate. The phosphorescent color was similar to fluorescence, except no pink coloration was present. The intensity of the phosphorescence was low; 10 seconds of exposure gave a 4 second response time.

No *flash* was discernable during testing.

Flash **(using photographic flash unit):** A red-orange *flash* response was observed in the butter-yellow section. This effect was followed by a weak phosphorescent response that lasted about 3 seconds. No *flash* was observed in the brown section, but a low intensity phosphorescent response was observed. The colors displayed by these sections were reminiscent of phosphorescence generated by the conventional ultraviolet source.

Effects of Ultraviolet Radiation on Model Specimens

Shortwave (254nm): This wavelength produced a bright, blue with pink undertone fluorescent response. This wavelength produced a bright, brilliant-blue phosphorescent response. This response lasted 7 seconds with a 5-second exposure time. No *flash* was visible; the bright intensity of phosphorescence produced inhibited assessment of this effect.

Mid-wave (312nm): A bright pink with blue undertone fluorescent response occurred. A bright, blue phosphorescent response was observed. This phenomenon lasted 8 seconds with 5-seconds of exposure. No *flash* was detectable; the intensity of phosphorescence produced inhibited assessment of this effect.

Longwave (351nm): A fluorescent response was featured by bright pink coloration. Some areas displayed a moderate-bright, yellow-gray reaction. This wavelength generated a very dim, blue gray phosphorescent response that lasted 4 seconds with a 5 second exposure time. No *flash* was apparent.

Longwave (370nm): This wavelength generated a fluorescent response exhibiting bright pink coloration was observed. Some areas displayed a moderate-bright, blue-gray reaction. A low intensity blue-gray phosphorescent response occurred; this effect lasted 2 seconds with 5 seconds of exposure. No *flash* was noticeable.

Flash**: (using photographic flash unit)** a bright, red-orange response was noted.

Discussion

The luminosity displayed by the model specimens were in agreement with descriptions in mineralogical reference books, except an undertone layering effect that was noted. Each of these specimens displayed fluorescence and phosphorescence in a homogeneous fashion, as expected. The responses were impressive in terms of colors and brightness. Trace quantities of Rare Earth Elements including Europium and Samarium have been identified as inorganic activators that cause the luminosity. However, the role of organic activators may play has not been excluded.

The fluorescence and phosphorescence regarding the principal sample are distinctive in regard to their daylight coloration. The light brown section produced essentially the same luminescent reaction to the known ultraviolet wavelengths aside from some differences in response intensity. However, the butter-yellow section displayed luminosity that was significantly different from the light brown section. Each ultraviolet wavelength produced a different fluorescent and phosphorescent response.

The luminosity displayed by the principal sample is more complicated compared to the model samples and appears to be dominated by organic activators. These compounds generate fluorescence and phosphorescence in calcite and other carbonate minerals, while inorganic activators tend to produce fluorescence exclusively. The concentration of organic compounds in the form of bituminous or petroleum - based matter contributes to the daylight appearance, but any relationship to luminosity appears less certain considering the different luminescent responses.

In all cases, *flash* has been attributed to trace quantities of manganese and lead with certainty.

There is much to be learned about the effects displayed by the principal sample. Hopefully, the information presented in this essay helps to expand our knowledge of mineral luminosity, as well as, provide added interest and appreciation for Terlingua calcite from the Little 38 mine.

Selected References

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Via Midwest Chapter Nov/Dec 2020

May Your Stockings Be Filled With Mineral Surprises

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

by
Richard Francaviglia

(Final portion of the article)

The irony of my lucky purchase is that it turns traditional wisdom upside down. We often hear about folks who've found fool's gold (pyrite) believing it to be the real thing. However, in this case, many of those model railroaders -- and even the vendor -- evidently thought these vials amounted to a just a poorly prepared load of fool's gold! To me it was a great deal for more than my meager investment (though I think these specimens might be worth about two hundred dollars today). Rather, it was because researching these specimens enabled me to learn more about the nature of gold and the locales in which it is found.

"X -- The Unknown"

Another unexpected mineral encounter occurred more recently after the death of my brother- in-law Phil Sherrer in Grants Pass, Oregon. This was a profound loss to me because we had been close for more than five decades and had many interests in common, including out mutual love of geology. Shortly after I first met Phil in the early 1960s, he attended college and graduated with honors in geology from San Diego State University. Throughout his life he could read the landscape and relate the geological forces that had shaped it. I must say that Phil loved all geological specimens -- even "country rock" interested him -- no surprise for a guy whose thesis dealt with magnetic anomalies in the petrology of western Arizona. Over several decades, Phil had collected about two dozen boxes full of "geological specimens," as they were labeled. Being a procrastinator, Phil told me "I am going to go through those boxes with you someday, and we can label them properly..." but that day never came. After his death it now fell upon me -- who else? -- to go through them.

As I opened each box I realized that Phil's labeling was, to put it charitably, haphazard. Some specimens were labeled as to name of mineral and location, but most were not. I soon discovered that most were pretty non-descript rocks, including many from his thesis area, but in a few boxes there were some really showy mineral specimens. Among the most stunning are those he personally collected in California fifty-plus years ago -- gorgeous honey-colored barite crystals from Palos Verdes Estates; radiating forest green actinolite crystals from near Wrightwood; huge zoned halite crystals from a "dry lake, Mojave desert." My personal favorites are the less showy ore specimens he had found near the old ghost town of Darwin in the Inyo Mountains. Many of these will remain in the family, and some will be donated. Most, though, were undocumented and impossible to identify, and will form a sizable rock garden in his memory.

In going through one of those boxes, I found two loose labels, one for "Pitchblende" and the other "Sudbury" --evidently referring to that famed mining area in Ontario, Canada. I recalled puzzling about an unlabeled specimen in that box that was comprised of jet-black veins

between layers of buff-colored matrix. The specimen was about fist-size, so I broke it carefully into a few that were about 1.5 inches square. *My goodness*, I thought, *the fresh exposures of these specimens are remarkable*. What really caught my eye was their almost vitreous metallic look that was so shiny it seemed to be black quicksilver. I wasn't sure what it was, but vowed to test it as soon as I could. In the meantime, I marked it with an "X" for unidentified, with a question mark about whether or not it might be from Sudbury.

To better identify these mystery specimens I figured I'd borrow a Geiger counter. However, no one I knew owned one, and rock shops in my area do not sell them. So, I got on line and ordered a new GQ Electronics Geiger Counter (GMC-300E) for only about 75 dollars. After all, I had *always* wanted one anyway -- probably influenced by those radioactivity-charged Cold War era and outer space exploration movies such as "X -- The Unknown" (1956). About a week later, as the proud owner of this palm-sized device, I drew it over the specimens in my collection. I noted that most were in the normal/safe range, while the bright yellow carnotite specimens (that Phil had found in the "Colorado Plateau") registered as radioactive. Having loved the sound of Geiger counters in the movies, this was thrilling. However, when I waved it over those mysterious shiny black specimens, the device simply went wild -- registering way out into the extreme danger zone! Alarmed by the word "evacuate," I hastily took them out to the garage, where I placed them in a cigar box full of lead sheets and automobile wheel weights. I discovered that lead really does the job, for the exterior of the cigar box reads in the normal/safe range. Nevertheless, I feel more comfortable keeping those specimens out in the garage. The irony was that these were found in a box containing "fine mineral specimens" that had been stored in Phil's bedroom, less than five feet from where he slept for seven years! I know what readers might be thinking -- "Ah, he should have been more careful," but I should note that his cause of his death was heart failure completely unrelated to them.

"Drops of the Blood of Jesus"

The last accidental encounter is very recent and is not about a real specimen. That may sound strange, but *Rock & Gem* magazine has featured minerals depicted by artists. However, the one I will describe here occurs not in art, but rather in literature, specifically fiction. I encountered this mineral specimen as I was writing a novel last year titled *The Enchantress of Atacama* (Amazon.com books, 2019). As its name suggests, this novel takes place in South America and involves considerable mystery and intrigue -- especially so because it is set in the early 1970s when the mining industry was about to be nationalized. This political thriller is narrated from the perspective of Thomas Williams Mendoza, whose first job out of UCLA is with a copper mining company down in Chile's austere and politically volatile desert north; however, the novel's namesake protagonist is the remarkable Carmen Segura, who works for that same company as a community outreach specialist. Thomas is an amateur mineralogist and frequently brings minerals to the reader's attention. For example, he notes that Carmen's alluring eyes "...flashed with hints of a deep purplish brown -- not unlike the rare hessonite garnet, or cinnamon stone as it is sometimes called."

But metals mining is what brought Thomas here and it drives the plot. In one scene, he and Carmen find the body of a murdered man near the ore-dump of a long- abandoned silver mine. On their way back to report the crime, he spots "a small rock the size of a walnut with a drop of blood on it." The blood is dry, and something compels Thomas to stuff the rock into his

pocket. Only later that night in his hotel room does he take a closer look at that "small rock with the blood stain on it, which gleamed like a ruby" -- realizing that it "was not a drop of blood at all, but rather a crystal the size of plump raisin." Thomas recognizes it as a crystal of proustite or ruby silver, which miners in the Atacama Desert call "*gotas de la sangre de Jesús*" (drops of the blood of Jesus). This metaphor is appropriate, for the novel is about the bloody struggles that will shape the fortunes and misfortunes of the Atacama miners.

How does this relate to my other accidental mineral finds such as tourmaline and gold? Well, I can honestly say that I had no idea that a specimen of proustite would figure in the novel when I began writing it. In fact, it came to me in a dream when I was writing the chapter about the discovery of the body. This unexpected discovery of proustite as a literary metaphor made me aware that minerals are not only hidden in the earth, but can also be hidden deep within our subconscious thoughts. Speaking of which, I've never thought much about it before, but for as long as I have been collecting minerals I have occasionally dreamed about them. These dreams are always pleasant and adventure-filled, for I often find beautifully crystallized and colorful specimens in out-of- the-way places with spectacular settings. This makes me wonder: Is this just one of my idiosyncrasies (among many), or do other readers have similar dreams? I feel pretty certain about one thing: If anyone else dreams about minerals, it is likely that they will also be readers of this magazine!

About the author. Richard Francaviglia is semi-retired after a fifty-plus year career as a university professor and administrator as well as planner and historic preservationist. He served as Director of the Bisbee Mining & Historical Museum (1983-84) and is now living in Salem Oregon, where he is an Associated Scholar at Willamette University. In addition to the novel mentioned in this article, he recently published the non-fiction book titled *Imagining the Atacama Desert: A Five-Hundred-Year Journey of Discovery* (University of Utah Press, 2018), which includes information on mining and mineral collecting in that hyper-arid portion of South America.

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Interesting YouTube Videos

Russian Gems and Minerals

[Editor's note: Be prepared to pause the video since he goes quite rapidly.]

https://www.youtube.com/watch?v=B23TisfG3pU

Abandoned Mine Exploration

[Editor's note: At times I think this guy takes too many chances so, be warned. Hours and hours of fun viewing.]

https://www.youtube.com/channel/UCU7kKUhwDj8jTbJHI8GL21A


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GEOLOGY, MINING AND FLUORESCENT MINERALS AT THE OMYA WHITE KNOB QUARRY, SAN BERNARDINO MOUNTAINS, SOUTHERN CALIFORNIA

Howard Brown, FMS #1449
Lucerne Valley CA 92356

INTRODUCTION

The Northern San Bernardino Mountains in Southern California contain the largest high brightness, high purity limestone mining operations in North America (Figure 1). Combined production of limestone products from several mining operations is approximately 5.0 million tons per year (Brown 2008). Omya Inc., Specialty Minerals Inc., and Mitsubishi Cement Company are the major limestone producers.

The Omya California Lucerne Valley operation in the Mojave Desert at the base of the San Bernardino Mountains is currently producing high grade calcium carbonate from the Sentinel, Butterfield and White Knob Quarries (Brown 2008). White Knob Quarry is the topic of this article and will be discussed in more detail. A variety of fluorescent minerals are present at the White Knob Quarry, and in recent years the site has become the foremost fluorescent mineral collecting location in Southern California.

This article will discuss the regional and local geology of the area, the formation and mining of the limestone deposits as summarized by Brown (2008), and then focus on the description, modes of occurrence and genesis of the fluorescent minerals at the White Knob Quarry.

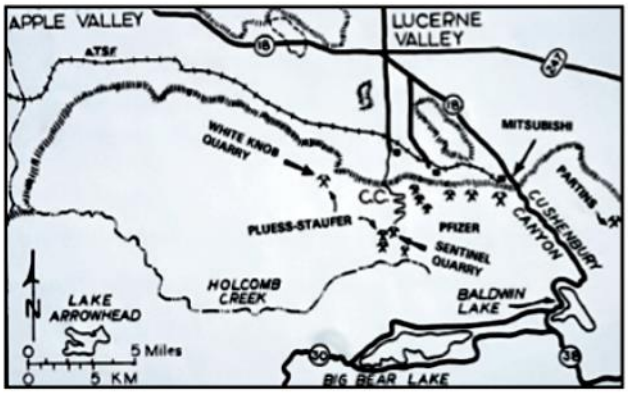

Figure 1. Location of the White Knob Quarry along the north slope of the San Bernardino Mountains, Lucerne Valley area of the Mojave Desert, Southern California.

REGIONAL GEOLOGIC SETTING

A variety of rocks of Precambrian to recent age are exposed within the San Bernardino Mountains and the White Knob Quarry area. Late Precambrian and Paleozoic metasedimentary[1] rocks unconformably[2] overlie older 1.8 Ga Baldwin Gneiss Precambrian basement. Late Proterozoic and Paleozoic sequences in the San Bernardino Mountains contain elements of both cratonal[3] and miogeoclinal[4] affinity (Figure 2). The lower part of the sequence is dominated by quartzite of the Stirling Quartzite, Wood

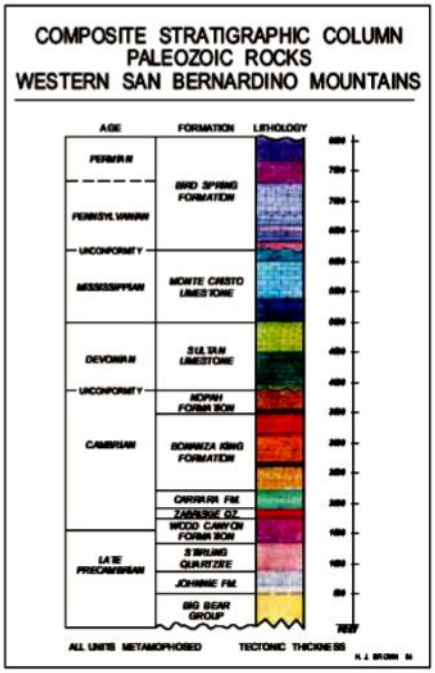

Figure 2. Composite stratigraphic column of late Pre-Cambrian and Paleozoic rocks in the San Bernardino Mountains. Orebody at White Knob Quarry is within Mississippian Monte Cristo Limestone. (Brown 1991)

[1] A sediment after some metamorphose, like sandstone to quartzite; limestone to marble; shale to schist
[2] A significant time passed between two rock formation without any trace of another rock layer
[3] Sediments deposited next to a stable portion of the earth's crust
[4] Sediments deposited farther away from a craton

Canyon Formation, and Zabriskie Quartzite. The Cambrian Carrara Formation contains both clastic[5] and carbonate members. Cambrian strata are dominated by dolomite of the Bonanza King and Nopah Formations. A major unconformity is present between Upper Cambrian and Devonian strata throughout the Mojave region and San Bernardino Mountains.

Upper Paleozoic rocks, including upper Devonian Sultan Limestone, Mississippian Monte Cristo Limestone and Pennsylvanian thru Permian Bird Spring Formation, are dominated by limestone. High brightness, high purity crystalline limestone deposits occur in upper Paleozoic miogeoclinal limestone formations in the San Bernardino Mountains and at White Knob Quarry. The Mississippian Monte Cristo Limestone is mined for high brightness, high purity calcium carbonate, and the Pennsylvanian Bird Spring Formation is extensively mined for cement grade limestone. Fluorescent minerals at the White Knob Quarry occur in the Monte Cristo Limestone.

Several varieties of intrusive rocks ranging from Permo-Triassic and Mesozoic ages are present in the San Bernardino Mountains and form the majority of the mountain range. Older Paleozoic rocks described above were intruded by the plutonic rocks and form roof pendants.

The late Proterozoic and Paleozoic rocks have been affected by regional and contact metamorphism. Regional metamorphism ranges from Greenschist to upper Amphibolite facies. Amphibolite grade is identified based on the presence of diopside, vesuvianite, wollastonite and garnet bearing calc-silicate minerals. Contact metamorphism is widespread, and numerous small skarn deposits are present along some contacts between metasedimentary and intrusive rocks.

Several tectonic events have been recognized in the San Bernardino Mountains. These include complex Permo-Triassic and Mesozoic age folding and thrust faulting, metamorphic, and intrusive events. Cenozoic activity includes several generations of high and low angle faults, and mild folding. The San Bernardino Mountains area continues to be seismically active as evidenced by the significant earthquakes in the area during the last 15 years.

GENESIS OF WHITE HIGH CALCIUM LIMESTONE DEPOSITS IN THE SAN BERNARDINO MOUNTAINS AND WHITE KNOB QUARRY AREA

Carbonate rocks are found extensively on all continents, but high purity, high brightness (white) limestone deposits are relatively uncommon in nature because their formation is dependant on the superposition of several independent geologic processes, acting over a long period of time. Among the processes are:

1. Deposition of originally pure limestone in high energy agitated, shallow marine environment
2. Post depositional changes including metamorphism and/or magmatic processes to bleach and recrystallize the rock, and disperse any impurities which may have been present
3. Structural controls including folding, faulting and orogenic processes to place the rocks in desirable structural settings
4. Uplift and erosion
5. Preservation thru geologic time.

Because all the geologic processes are required, deposits of high calcium white crystalline limestone are unique and relatively uncommon in nature, and are vastly different from common limestone. The San Bernardino Mountains contain several productive white, high purity limestone deposits, and the area is by far the largest producing district in Western North America.

GEOLOGY AT THE WHITE KNOB QUARRY

The White Knob Quarry area is located within the Butler Peak (Miller, Matti, Brown 2000) and Fawnskin (Miller, Matti, Brown and Powell 1997) USGS quadrangle maps (Figure 3).

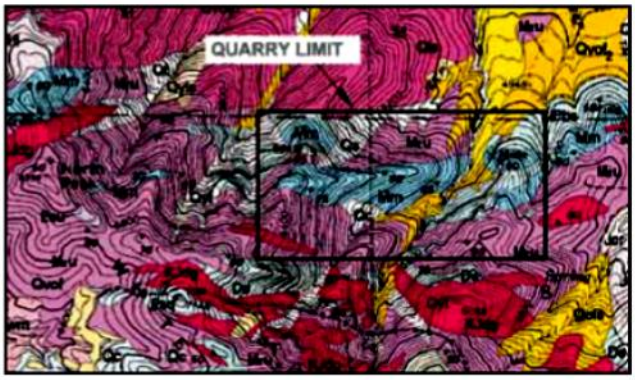

Figure 3. Geologic map of the White Knob Quarry area, from the USGS Butler Peak 7.5' quadrangle, (Matti, Miller and Brown 1995). Scale 1:24,000. Yellow shades (Q, Qal, Qof, Qls, Qyls, Qa) Quaternary and Pleistocene unconsolidated alluvial and landslide deposits. Various red and magenta shades (Triassic-Cretaceous) granitic intrusive rocks, light blue (Pbs) Pennsylvanian Bird Spring Formation, medium blue (Mm) Mississippian Monte Cristo Limestone (orebody), grey (Ds) Devonian Sultan Limestone.

[5] A mechanically fragmented sediment, a conglomerate

Rocks at the White Knob Quarry include Paleozoic metamorphosed sedimentary rocks, Mesozoic granitic rocks and younger landslide, talus and alluvial deposits.

Paleozoic Rocks and Limestone Deposit

Ore grade limestone at the White Knob Quarry is mined from the Bullion Member of the Monte Cristo Limestone of Mississippian Age. The stratigraphic section of Monte Cristo Limestone at the White Knob Quarry is developed in an isoclinally[6] folded and overturned section. The full thickness of the Bullion Member is up to 400 feet thick. The White Knob Quarry deposit occurs in the core of a tight overturned synform[7] fold. In the quarry area the rocks strike nearly East-West and dip to the south. Dips range from about 45 degrees to vertical.

Fluorescent minerals do not occur in the ore at White Knob, but do occur in some of the waste rock. The Arrowhead Member of the Monte Cristo, a metamorphosed impure cherty limestone, contains abundant fluorescent minerals.

At the White Knob Quarry, rocks have been metamorphosed to amphibolite and locally granulite facies, forming exceedingly coarse grained, very white translucent calcite marble. Individual calcite rhombs are commonly over one inch across. The steeply dipping deposit is over 1500 feet along strike, and is exposed over 1200 feet vertically.

Mesozoic Rocks

Mesozoic rocks at the quarry include a variety of granitic rocks which have intruded the deposit; and, younger thin granite dikes have intruded the deposit in several places. Intrusive rocks can be differentiated into older Permo-Triassic monzonite which is non-fluorescent, and younger Jurassic-Cretaceous thin siliceous granitic dikes in which feldspars are highly fluorescent.

The intrusive rocks have repeatedly metamorphosed the carbonate rocks, and have allowed the coarse grained marbles to form. Uplift and erosion of overlying rocks has have revealed the lower portions of the metamorphosed roof pendants which are largely engulfed in the plutonic rocks.

Other Metamorphic and Mineralized Rocks

Contact metamorphism in the general area of the quarry has formed several small skarn zones, some have been prospected in the past for a variety of metallic minerals including gold, copper and zinc. The known showings are small and non economic, but some do contain a variety of both fluorescent and non-fluorescent minerals.

[6] A folded formation with very tight parallel limbs, like a hairpin
[7] A fold were the limbs are closed downward, such a fold is synformal in shape and the limbs are parallel, isoclinal

Younger Rocks and Alluvial Deposits

Younger rocks at the quarry area are derived from the older sedimentary, metamorphic and igneous rocks and include landslide, talus and alluvial deposits.

Landslide deposits are located along the north slope of the deposit and within drainages to the east and west of the deposit. A landslide deposit to the north includes numerous very large boulders of white marble. Early attempts at mining the deposit were in the landslide material and recovered the white boulders. Talus and landslide deposits had formed in Pleistocene and Holocene time by erosion and slope failures, and may have been triggered by seismic activity. Several generations of Pleistocene deposits thru recent alluvium are also present.

MINING AND PROCESSING

The White Knob Quarry is a multi bench open pit mine. Two or three working levels are operated at any one time to supply the quota of ore needed to meet production demands. The multi working level concept allows greater selectivity and blending to meet stringent quality standards of customers and allow maximum utilization of the resource.

Topography in the area of the quarry is extremely steep and the deposit originally formed an East-West trending ridge about 1500 feet long. The limestone deposit originally outcropped over a vertical interval of more than 1200 feet. The quarry has been developed by a series of 15 benches excavated into the mountain side.

Several grades of ore and waste rock are mined from White Knob Quarry. Ore and waste rock is drilled and blasted, loaded with a front end loader into 85 ton haul trucks and hauled to the crusher. At the crusher, the rock is reduced in size and separated into the various quality grades. Crushed ore is transported in 100 ton haul trucks 6.5 miles to the existing Omya processing plant in Lucerne Valley.

At the plant, crushed ore is processed into ground products. Finished products range from fine (10μ) to ultra fine (2μ) particle size, and are shipped by truck or rail to consumers, who utilize the limestone products to produce many finished consumer products.

LIMESTONE PRODUCTS

Some of the consumer products made from Omya limestone mined from the San Bernardino Mountains are shown in Table 1. The socio-economic impacts of the limestone mining in the San Bernardino Mountains allow us to live the life we live. Our lifestyle and civilization as we know it would not be possible without limestone.

ENVIRONMENTAL	CONSTRUCTION	CONSUMER PRODUCTS	HUMAN OR ANIMAL USES	SOME OTHER USES
Water filtration	Dry wall mud	Crayons	Pharmaceutical products	Athletic field line marker
Acid water neutralization	Paint	Glue	Antacids	Wire coating insulation
Acid sewage neutralization	Plastics	Fabrics	Buffered aspirin	Carpet backing
Acid rain neutralization	Stucco	Polyester	Calcium supplements	Sugar refining
Air emission control	Roofing paper	Latex compounds	Toothpaste	Floor tile
Acid soil treatment	Synthetic marble	Household cleanser	Disinfectants	Glass
	Calking compound	PVC pipe	Chewing gum	Fiberglass
	Tile grout	Shoe polish	Chicken grit	
	Roofing shingles		Animal nutrients	
	Highway paint			

Table 1. Some common consumer products made from limestone mined by Omya California, Inc.

FLUORESCENT MINERALS AT THE WHITE KNOB QUARRY

Although mining started at White Knob in 1988, it was not until 2004 that fluorescent minerals were recognized to be present at the quarry. Since then the White Knob Quarry has become the foremost fluorescent mineral collecting location in Southern California. A variety of fluorescent minerals are commonly present within the waste rock, however, ore grade calcium carbonate discussed above is essentially non-fluorescent. At the White Knob Quarry, fluorescent minerals are exposed over a vertical interval exceeding 1200 feet. Fluorescent minerals are fairly common and range from sand sized grains to large boulders weighing 20 tons or more. Since the discovery of fluorescent minerals, many hours have been spent "lamping" the quarry, mapping the modes of occurrence, and noting the geological characteristics of the fluorescent mineral occurrences.

Most of the fluorescent minerals at the White Knob Quarry are common and relatively abundant in some of the waste rock. Some blasts contain >1000 tons of fluorescent material in a single shot. It can be estimated that prior to mining, the quarry area may have contained more than 100,000 tons of fluorescent rock.

Fluorescence and Activators

Fluoresce has been explained and written about in several articles previously published in the Journal of the Fluorescent Mineral Society and will not be repeated here. For a recent summary the reader is referred to Wilkins (2011).

Generally most pure minerals do not fluoresce. Most often fluorescence is caused by an activator—a foreign element that introduces the necessary energy levels into the mineral to allow fluorescence. The most important activators are manganese (Mn^{2+}) and lead (Pb) which cause red and orange fluorescent colors as well as yellow fluorescence, uranium (U) which causes green fluorescence, and rare earth elements especially europium which allows blue to violet fluorescence.

At White Knob, activator elements that allow the fluorescence to occur are Mn, Pb, Fe, U and possibly REE. These elements occur in minute quantities (a few parts per million) in some of the waste rock, and their presence in the right proportions cause the fluorescence to occur. Some of the fluorescent minerals, notably wollastonite also produce a "flash" or are phosphorescent. All known fluorescent minerals at the White Knob Quarry respond to short wave UV light.

Modes of Occurrence and Genesis of Fluorescent Minerals at White Knob Quarry

Fluorescent mineral occurrences at the White Knob Quarry have several modes of occurrence, and occur in rocks with a wide range of ages. Thus, it is likely that fluorescence may have formed at different times, as a result of different geological processes such as original chemical composition of sedimentary rocks, intrusion of various plutonic rocks, regional and contact metamorphism, and leaching and deposition from fluids and/or groundwater moving thru fractures in the rocks. Modes of occurrence include:

- 20–25 foot thick section within the Arrowhead Member of the Monte Cristo Limestone of Mississippian age
- Secondary fracture fillings within Arrowhead Member
- Thin potassium feldspar rich granitic dikes of Jurassic age

- Travertine coatings and fracture filling of N-S trending fractures
- Caliche coatings on weathered surfaces
- Contact metamorphic skarn mineralization.

FLUORESCENT MINERALS IN THE ARROWHEAD MEMBER OF THE MONTE CRISTO LIMESTONE

- Majority of the brightest and most colorful fluorescent minerals occur in the Arrowhead Member of the Monte Cristo Limestone (Figure 4).
  - The Arrowhead Member was originally cherty limestone and dolomite
  - High grade metamorphism formed impure wollastonite marble with other high grade calc-silicate metamorphic minerals
  - Also contains rhodochrosite, piedmontite, Mn-rich calcite, and fluorescent minerals

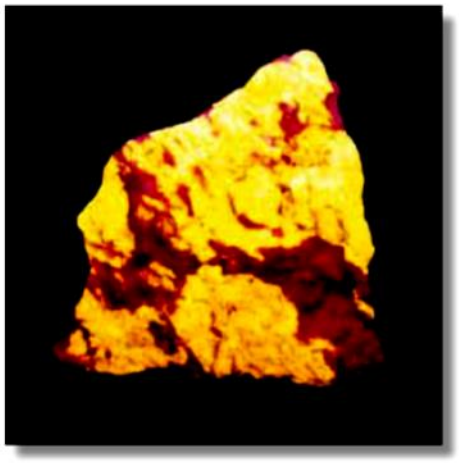

Figure 4. Fluorescent calcite (reddish orange) and wollastonite (bright canary yellow). Short wave. Specimen is six inches along base.

- Day glow orange fluorescing calcite and bright golden canary yellow wollastonite are most common fluorescent minerals. Wollastonite often displays a flash. Activator elements are managanese and lead.
- Also common within Arrowhead Member of Monte Cristo Formation:
  - Secondary fracture fillings of fluorescent violet and sky blue mineral within golden yellow fluorescing wollastonite (Figure 5). Suspected activator elements are REEs.
  - Fracture fillings of day glow green aragonite and/or green fluorescing chalcedony and hyalite. Green aragonite occasionally occurs as fracture surface coating on orange fluorescing calcite. Both are calcium carbonate. Activator in the Aragonite is Uranium, while manganese is the activator in the orange fluorescing calcite (Figure 6)
  - Recently an unidentified olive green fluorescing mineral has been noted. In plain light the mineral looks like a light brown iron oxide stain on fractures.

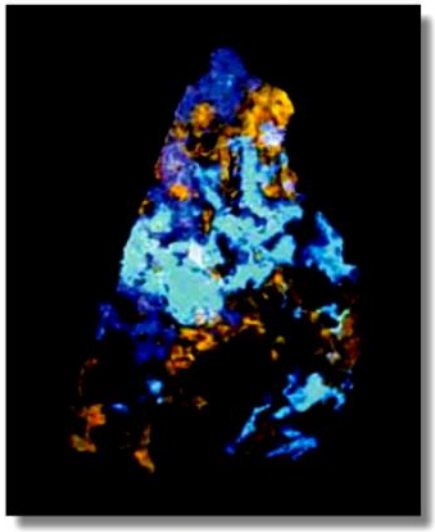

Figure 5. Secondary fluorescent mineral coatings (sky blue and violet) on lemon yellow fluorescing wollastonite. Short wave. Specimen ten inches high.

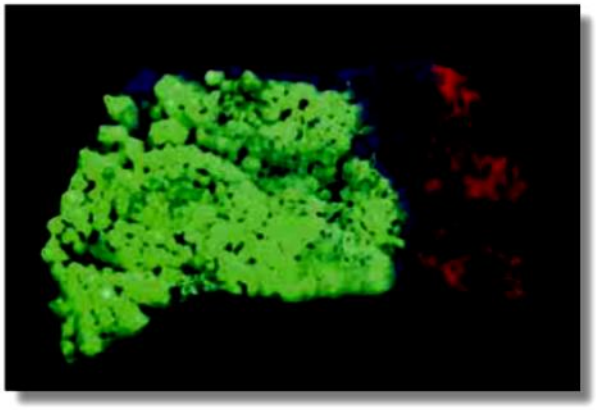

Figure 6. Secondary fracture filling green fluorescing euhedral aragonite ($CaCO_3$) crystals growing on red-orange fluorescing calcite marble ($CaCO_3$). Fluorescence in marble triggered by manganese, fluorescence in aragonite triggered by uranium. Short wave. Specimen is six inches along base.

THIN POTASSIUM FELDSPAR RICH GRANITIC DIKES

Other common modes of occurrence are thin cross-cutting potassium feldspar rich dikes of Jurassic age that intruded the Paleozoic marble.

- Potassium feldspar fluoresces a deep magenta red (Figure 7).
- When the dikes have intruded the Arrowhead Member of the Monte Cristo Limestone, multi-color specimens (with up to six colors in fluorescence) showing spectacular cross-cutting relationships have occurred (Figures 8–11).

TRAVERTINE AND CALICHE COATINGS

Common but less colorful are travertine fracture filling and caliche coatings. Most travertine filled fractures are North-South trending fractures. Some fracture fillings are a thin coating, but some are open space filling as much as two feet thick, and may contain colorful banded travertine. Uncommon are incompletely filled fractures with cave drip, flowstone, and small straw like stalagtites.

- Travertine and caliche generally fluoresce bright white.
- Strong phosphorescence is often displayed.

CONTACT METAMORPHIC SKARN ZONES

The least common fluorescent minerals are associated with contact metamorphic skarn formations where Jurassic dikes have cut the Paleozoic marbles.

- They occur occasionally along intrusive contacts with impure marble layers.
- Include fluorescent diopside and dolomite, and other fluorescent calc-silicates, and uncommon tungsten and molybdenum minerals such as disseminated powellite, which fluoresces as bright white snow flakes (Figure 12).
- Several occurrences of metallic minerals and small sulfide deposits of iron, copper and zinc sulfides are also present but the sulfides are not fluorescent.

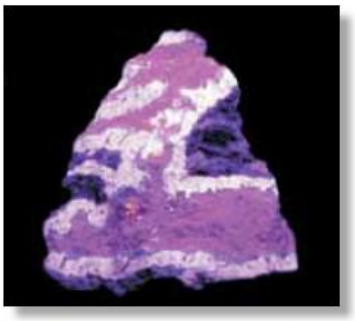

Figure 7. Magenta fluorescing feldspar rich granitic intrusive in contact with yellow fluorescing wollastonite, and black non-fluorescent calcite. Short wave. Specimen is six inches along base.

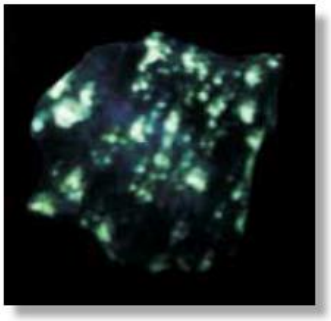

Figure 12. Powellite from White Knob Quarry.

CONCLUSION

The San Bernardino Mountains and the Omya White Knob Quarry area has been, and will continue to be one of the largest sources of high brightness, high purity calcium carbonate products in North America.

A variety of fluorescent minerals are commonly present within waste rock, and the White Knob Quarry has become the foremost fluorescent mineral collecting location in Southern California. The quarry owner has generously allowed organized collecting, and several organized collecting trips occur every year. ■

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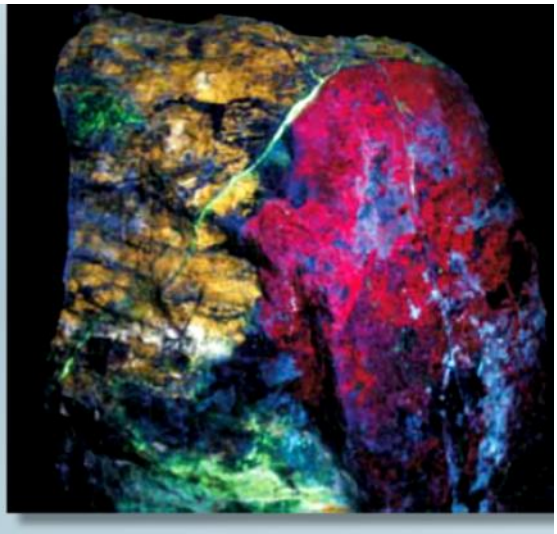

Figure 8. Multi-colored specimen of calc-silicate minerals including wollastonite, diopside, and aragonite cut by magenta fluorescing granitic dike. Specimen is twelve inches across. Photo courtesy of Pete Xander.

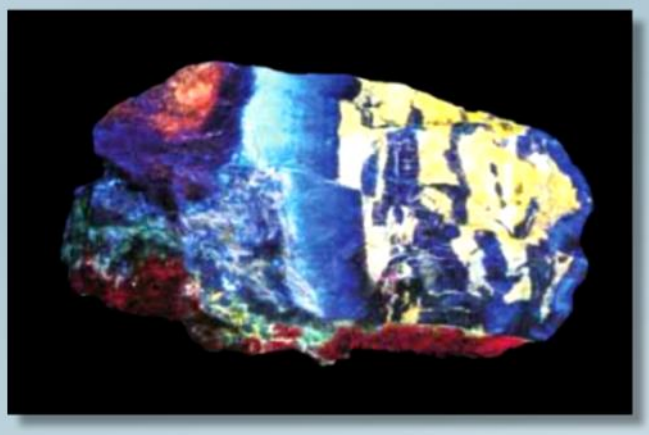

Figure 9. Six color specimen containing wollastonite, diopside, dolomite, calcite, and aragonite cut by magenta fluorescing granitic dike. Specimen is seven inches long.

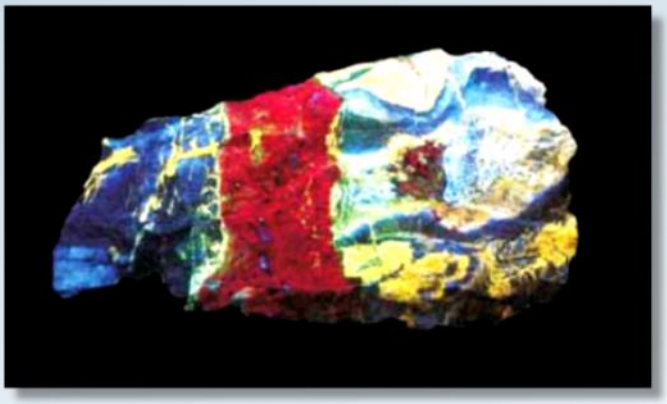

Figure 10. Folded wollastonite (yellow), and diopside (blue) cut by magenta fluorescing feldspar rich granite dike. Specimen is eight inches along base.

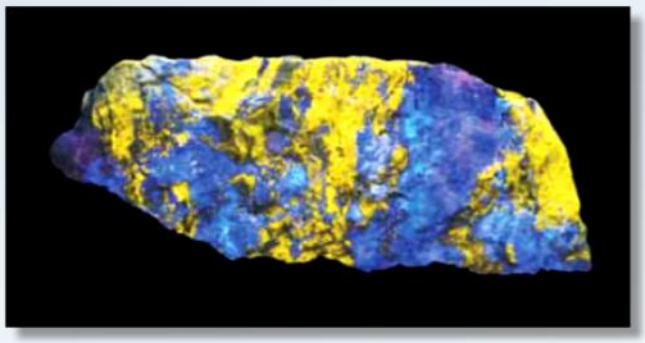

Figure 11. Wollastonite (yellow) with secondary fracture filling and coating of unknown blue and purple fluorescing mineral. Specimen is eight inches along base.

COLORADO CHAPTER UPDATE

http://friendsofmineralogycolorado.org/

Nothing to really report from Colorado other than everything is on hold due to COVID-19. Hope to get started on some meetings this coming spring.

Bob Hembree
President
Colorado Friends of Minerology

MIDWEST CHAPTER UPDATE

www.fommidwest.org

See article on Page 9

MISSISSIPPI VALLEY CHAPTER UPDATE

Your Report could be here!

NEW JERSEY CHAPTER UPDATE

https://fomnj.wordpress.com/

Your Report could be here!

PACIFIC NORTHWEST CHAPTER UPDATE

www.pnwfm.org

From Toby Seim, President Pacific Northwest Chapter

Greetings All,

There has been some good feedback regarding our PNWFM Chapter and last October's symposium. The experience of the virtual symposium was different and new to many of us and I believe the people who participated learned a few new things, whether it was Mineral related or technology related. For me, it was very refreshing to see the questions and participation of our general members in addition to the chemistry of our organizers behind the scenes. Everyone involved really did a fantastic job.

Our General Meeting (10/18/2020) was very productive and I was pleased with the newly determined actions. A few highlights of the meeting included selecting our 2021 Symposium theme *"Minerals of Africa",* the election of officers for 2021 & 2022 (our current officers were re-elected) and my favorite highlight was awarding the 2020 Noble Witt Award to Bart Cannon. Can you believe he hasn't won it before? We are forever grateful to his involvement in the mineral world and his name will be etched into a plaque amongst other great mineral achievers at Rice Northwest Museum of Rocks & Minerals.

My first cut thunderegg

Another activity we conducted during our General Meeting was a review of our current FM Logo. It was determined to be an easy area where we can collectively work together to improve. It is important to me that our PNWFM Logo is something we are all proud of and is developed from the voice of our members. To help with this project, I encourage you to communicate potential ideas to me where I can relay to our artists to develop. Once there are a handful of meaningful logos our members will have the opportunity to vote for which logo best represents our organization.

PNWFM Member Dick Rantz – Lapidary Expert

With the New Year approaching it's a good time to create some meaningful goals. As a field collector, I find myself hoarding rocks and never really getting around doing anything with them. For this winter season, my goal is to clean, prepare and organize my rocks and minerals (simple and very much needed). Also, it only makes sense to soak in some of the great knowledge and experience With so many experts that specialize in different mineral related topics, it is my pleasure to have the opportunity to learn lapidary fundamentals from Dick Rantz, we have already spent good valuable time and I am hopeful to continue learning from the best.

I am excited see and hear all about your winter rock & mineral activities.

Cheers,

PENNSYLVANIA CHAPTER UPDATE

www.rasloto.com/FM/

Good times around the corner

President's Message
by Joseph Marchesani

The Fall 2020 Symposium went very well. Six people gave virtual on-line presentations on a variety of geology topics for the Fall FoM-PA 2020 Symposium. The Fall 2020 symposium was the first ever on-line symposium for FoM-PA and it went without gimmick. A very big thank you and job well done goes out to each and every board member who did their part and together we "pulled a rabbit from the hat." Board members Ron Sloto, Dave Glick, Mike Dunton, Bill Kochanov, Dianne Soccio and Bill Stephens did a fabulous job of organization to make it happen. There are not enough kind words in any dictionary to put forth, but to say thanks again to the FoM-PA board. The associated Sunday field trip with social distancing guidelines at Cornwall Quarry happened under blue skies and warm weather.

We initially had no idea on how to coordinate this Fall 2020 Symposium, and at one point it was a vote away from being cancelled. The team gathered in on-line meetings (the only way possible during the Covid-19 times), and sometimes not the entire team. We gathered every other week, then almost every week, for at least three months prior to the Fall 2020 Symposium. There was much bad news for our team, first from our initial venue at Franklin and Marshall College, then from other venues that shut the doors on gatherings thanks to the Covid-19 issue. Many ideas were thrown around, and so many disagreements, then it came to be the virtual live Symposium on the regular date, as we approach our fiftieth year of existence. For amusement, here are a few terminated ideas… 1) record presentations and make available somehow online, 2) scatter live presentations throughout the week, 3) postpone… etc. There were many other ideas. It was heartwarming to see so many participate as an audience, as it made all the hard work justified.

At the Symposium, the six presentations made via Zoom were also recorded. Videos of three of them are now available on the Chapter web site, with the other three being processed.

A brief annual Chapter Membership Meeting was also held via Zoom. Most business had been transacted in the weeks prior by mail ballot; members approved amendments to the bylaws to allow for virtual meetings of both the Board of Directors and the membership, and electronic notice of those meetings.

Well, it seems that there are multiple vaccines ready to combat the Covid-19 virus and they are currently being globally distributed. When this happens, we should start to approach an old sense of normalcy, that is, gathering together to collect specimens and minerals. The Spring 2021 looks possibly promising, and Fall 2021 looks better for the collecting enthusiast.

SOUTHERN CALIFORNIA CHAPTER UPDATE

WOW, this COVID pandemic has overwhelmed myself and others with many challenges this year. At least one of our members contracted the coronavirus early this summer and is still recovering from hospitalization in a weakened condition trying to breathe, so not venturing out to explore our Mojave Desert, even when invited. I hope all of the rest of you are safe and have not lost family or friends to this virus.

After the cancellation of our Spring Symposium and field trips due to the Nevada Governor's closure of all state and county facilities, we we announced that our Southern California Friends of Mineralogy chapter would stand down this fall and not conduct our traditional symposium and fall field trips. That was a hard decision in June, but as we watch counties one by one continue to be shut down by Governor Newsom with surges of cases and deaths still impacting efforts to open up society, it appears it was a wise decision. I got a phone call yesterday from one of our members asking if we were still on for our traditional fall symposium and field trips this weekend, October 24-25th, so I am sending out this last Friends of Mineralogy National Newsletter Bulletin to ensure all received it and are able to enjoy. I am also reminding all that we are not meeting this fall for obvious reasons.

We are hoping that we will be able to resume our symposiums next spring, so have put a tentative hold on the Search Light Community Center for our symposium, delayed by one year. As long as our speakers are healthy and able to enlighten us, we will plan for the weekend of March 27-28th. Past Board member and guest speaker Steve Scott stated he was willing to take us out through his favorite hunting grounds in southern tip of Nevada to share collecting sites he and his wife have enjoyed for decades. The Community Center is large and can easily accommodate our symposium with social distancing guidelines. It is one of the largest facilities I have ever seen during the last 20+ years I have been attending our symposiums, so this will be helpful considering all the restrictions that have been placed upon us this year and don't seem to be going away.

Dr. Don Buchanan, President Southern California Friends of Mineralogy

VIRGINIA CHAPTER UPDATE

It is hard to believe that FMVA was only officially recognized in May. Over these last few months, our team has worked hard to make our vision a reality. From constant Zoom meetings developing our bylaws and guidelines, to discussions about the future, we are finally here and settling in to a strong foundation for the future. We believe it is important for our chapter to take a look back and produce a yearly report of what we accomplished. This sets goals for the next year and lays out a clear path of what we did well and what we could do better. FMVA strives not only to be another successful FM chapter, but to highlight what the future of this hobby looks like and what we can accomplish together as a community.

To the entire FMVA family, we send a large thank you for your support and faith in what we have been working towards. Many of us were impacted personally by COVID-19 and no one had to take the time to make this happen, but the fact that you did shows that you believe in the future of Virginia minerals and mineralogy and supporting our hobby as a whole. Here is a short list of some of the core accomplishments of 2020:

- Hosted three speaker events (Brian Kosnar, Leah Luten, and Erin Delventhal)
- Hosted the JMU Mineral Museum Virtual Event (35 organizations represented)
- Designed the FMVA logo based off Barger Quarry Pyrite
- Published two bi-monthly newsletters for FMVA
- Created a Zoom assistance document for the mineral community
- Developed a Facebook, Instagram, and website for the organization
- Created a YouTube Channel to post recorded videos and VMP events

- Established three official FMVA partnerships:
    1. Shenandoah Valley Gem & Mineral Society
    2. Lynchburg Gem and Mineral Society
    3. Gem, Lapidary, and Mineral Society of Montgomery County MD., Inc.

(Virginia Chapter Report, continued)

Dear FM Community,

It's hard to believe that 2020 is almost over! This year has provided our community many heartaches and losses, but it was also the year a crazy group of dedicated mineral collectors came together to create a new chapter of Friends of Mineralogy. Our new Virginia Chapter (FMVA) took its first steps in one of the craziest years in modern times, but through virtual platforms and community passion, we accomplished much more than we could dream of. It has been astonishing to see the mineral community come together for our virtual events, with over 40+ organizations being represented at our meetings. Clubs from across the USA and fellow FM chapters came out to help us start a new journey here in Virginia. Within six months, we have built relations far and wide and our FM chapter is proving to be more than just Virginia in its roots. We were also fortunate to have a fresh logo developed for our chapter by Tama Higuchi and our sleek newsletter by Erin Delventhal, two highly successful young mineral collectors. FMVA has embraced this virtual world and have brought in countless young collectors and enthusiasts who share a passion for the hobby and enjoy sitting in states apart. While we are not sure what 2021 has in store, we know that our organization will continue to host quality speakers and share them with the community on our YouTube channel. We have several exciting plans for 2021 and cannot wait to share them with you all.

As always, everyone is welcomed to join us for our events, and we want to foster collaboration across all FM chapters. Please check out our website if you haven't and our recent newsletter. It is just the beginning of our chapter, but we have a bold future we seek to achieve through community participation and the relationships we have built.

From our chapter to yours, we wish you a wonderful holiday season and hope that 2021 will bring fresh and new opportunities to enjoy! Please reach out to us if you would like to collaborate on an event next year or wish to learn more about our mission.

Thomas Hale, President [Email: virginiamineralproject@gmail.com]
Alex Venzke, Vice-President [Email: 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?

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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