PACIFIC NORTHWEST CHAPTER
FRIENDS OF MINERALOGY

December 2025

PNWFM NEWSLETTER

Inside this issue:

Acanthite on silver, cinnabar. Cobar, Robinson Co., New South Wales, Australia. FOV 3.25mm. Ex Alan and Barbara Lundgren Collection

President's Message

Jessica Robertson

It's been a few months now since we wrapped up our 2025 Symposium (theme: Color in Minerals. If you missed any of the talks, no fear. They were recorded and will be uploaded to the Mineral Nation YouTube channel next year.

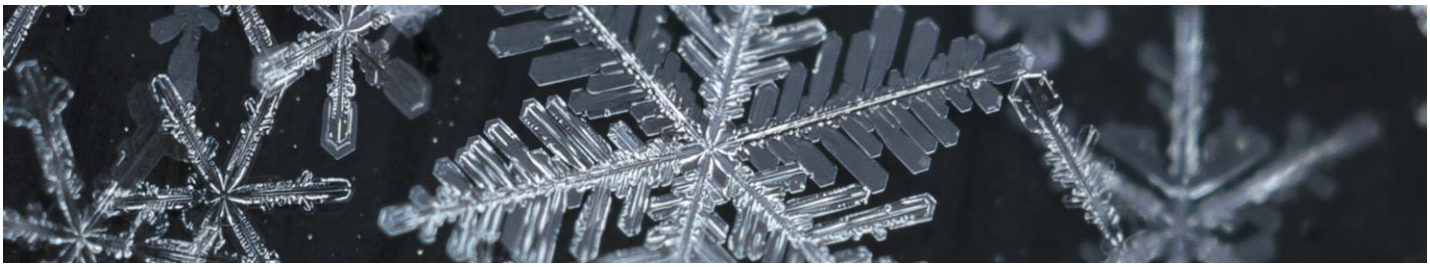
We appreciate everyone who attended and extend deep thanks to all who helped with setup and teardown–it made everything move so smoothly! We're also pleased with the feedback on this year's changes, including the SureStay hotel and the Saturday lunch option at CWU. A club display at the Rice Museum this summer!

The planning team has taken this feedback to heart and is working at exploring our options for 2026, including the potential to return to a Saturday evening banquet and an in-person Sunday morning membership meeting with a light breakfast.

The 2026 theme is "Minerals of the Great Basin" and we have already begun to compile a list of potential speakers. Please reach out to me or Markus Raschke if you have additional ideas for speakers that you would like us to consider. The dates for the 2026 Symposium will likely be firmed up in late February after we receive the fall schedule of events from CWU.

Stay tuned for more information on the above events as it is available. We will provide updates in this newsletter, the PNWFM Facebook page, and the PNWFM website. And as always, you all are invited to attend our monthly planning meetings via zoom. Please contact me to be added to the distribution list.

Merry Christmas and Happy Holidays!



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2025 PNWFM Symposium Report

Color in Minerals

October 10-12, 2025
Ellensburg, Washington

Displays (a photo report):

Zelan Anderson

Sal Noeldner

Rice Museum

Mitchel Tedder
and
Nomi Stutzman

Justin Coward
and
Elizabeth
Materi

John Lindell

Thea Stender

Aaron Wieting

Bruce Kelley

Lego Mineral Set

By Karen Hinderman

On his birthday in October, Gary received a Lego Mineral set. He spent the next 4 weeks putting it together a little at a time. With his eyesight challenges he would holler for Madi to assist every so often. Together they finished the three sections of the set. Then we all worked each section into our mineral display in the den. It adds a fun, new dimension to our growing mineral collection.

Noble Witt Award

The idea for an award to honor an FM member or "friend" of mineralogy originated with a long time member of the Pacific Northwest chapter, Noble Witt. The prestigious award soon became known as "The Noble Witt Award".

Nominations are called for each year from the membership to honor a person of the FM community that stands out as having made great contributions to the organization, to mineral science, and the mineral collecting hobby.

Nominations are received by the Chapter's Board of Directors and a recipient is selected from the nominees to receive the award and be honored at the Chapter's annual Symposium.

2025 Noble Witt Award Winner

Beth Heesacker

We are pleased to award this year's Noble Witt award to Beth Heesacker. Beth has been involved with PNWFM for many years, and has been essential behind the scenes as our longtime newsletter editor. Stalwart behind the scenes in compiling and editing our newsletters. Although health challenges have meant she has not been able to attend the symposium in-person for a few years, she remains deeply involved in the planning of the club and I (Jessica) love seeing her smiling face at each planning meeting. Beth is also heavily involved in the Northwest Micro Mineral Study group and the regional microminerals community–her photos frequently grace the pages of our newsletter when content is thin, despite her frequent and welcome reminders to club members to send her more photos and articles in an effort to make the PNWFM Newsletter the best it can be. Beth's effort, flexibility, and dependability have made sure our newsletters were published continuously through Covid and beyond. We appreciate you, Beth!

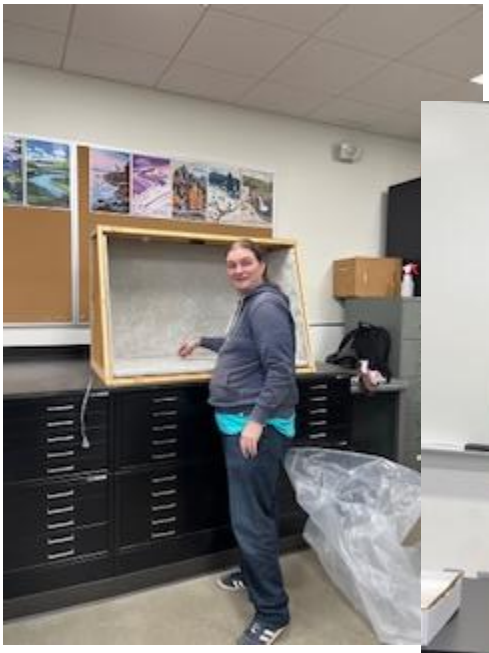
Other Recent Noble Witt Award Winners

2024 **Bruce Kelley**
2023 **Julian Gray**
2020 **Bart Cannon**
2019 **Randall Becker**
2018 **Douglas Toland**
2017 **Douglas Merson**
2016 **Rob Woodside, PhD**
2015 **Robert Meyer**
2013 **Al and Sue Liebetrau**

2012 **Allan Young**
2011 **Lorna Goebel** and **Karen Hinderman**
2010 **Wes Gannaway**
2007 **Bill Dameron**
2004 **Lanny Ream**
2003 **Sharleen Harvey**
2002 **John Lindell**
2001 **Harvey Gordon**
2000 **Rudy Tschernich**

Thank you to all the 2025 Symposium Volunteers, Speakers, Attendees and Others Who Made It All Possible

Cedar, Sal, Christian



Madi

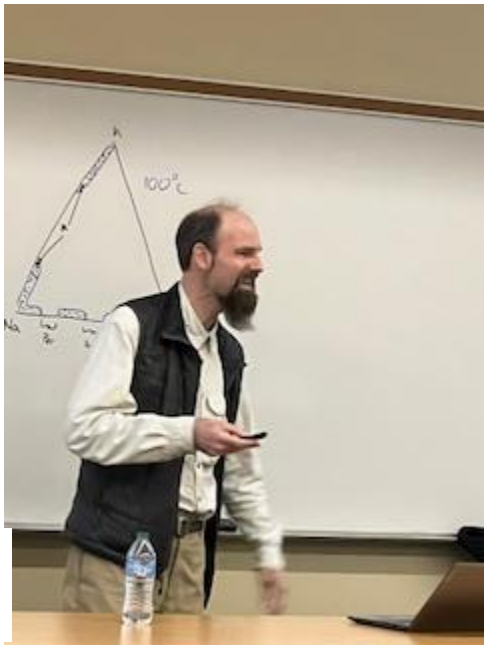
Gary

Bruce and Fiona

Justin and Sal

Zelan and Mike
setting up their case

Speaker John Rakovan,
The Causes of Color in Minerals



Speaker Chris Mattinson,
Color in Thin Sections

Master of Ceremonies Julian Gray

Annual Membership Meeting Minutes November 2, 2025

On November 2, 2025, 7 members met for our annual meeting on Zoom. With such a low turnout, we will consider holding our annual meeting during next year's symposium.

2025 Symposium Review: Seventy-two individuals, including speakers, attended the symposium. This was down 22 from last year's attendance. Nine high quality cases were displayed. Our setup and tear-down crews were incredible. Auctions and raffle brought in approximately $4300. With reduced fees for use of CWU facilities, we will make a decent profit.

We tried a few new activities this year with a raffle, a lunch time auction, and a student poster session. There were some technical difficulties that will be worked out by next year. Ideas to improve attendance at the 2026 symposium include reducing cost of registration and increasing our advertising budget.

Survey Report: Fourteen members responded to the survey that was sent out. Results as follows 1) there was some confusion around auctions and raffle, we will try to explain what is happening more clearly; 2) several would like the presentations piped into the silent auction/cases classroom; 3) lunch boxes vs evening banquet was about even. We would really love some more input on this for next year. It may be possible to stay at the current hotel and have the banquet at the Red Lion. The challenge is honoring the time needed for room dealers to make money; 4) this year's hotel seemed to work well for most.

Noble Witt Award was given to our very deserving newsletter editor, Beth Heesacker.

Good of the Order: Current paid membership is 75. Next year will be an election year. Please consider joining our team of officers. Coming activities include the Spring Rendezvous at the Rice Museum, participation at the Seattle Mineral Market (need volunteers), and looking at field trip opportunities.

Submitted by Karen Hinderman, Secretary

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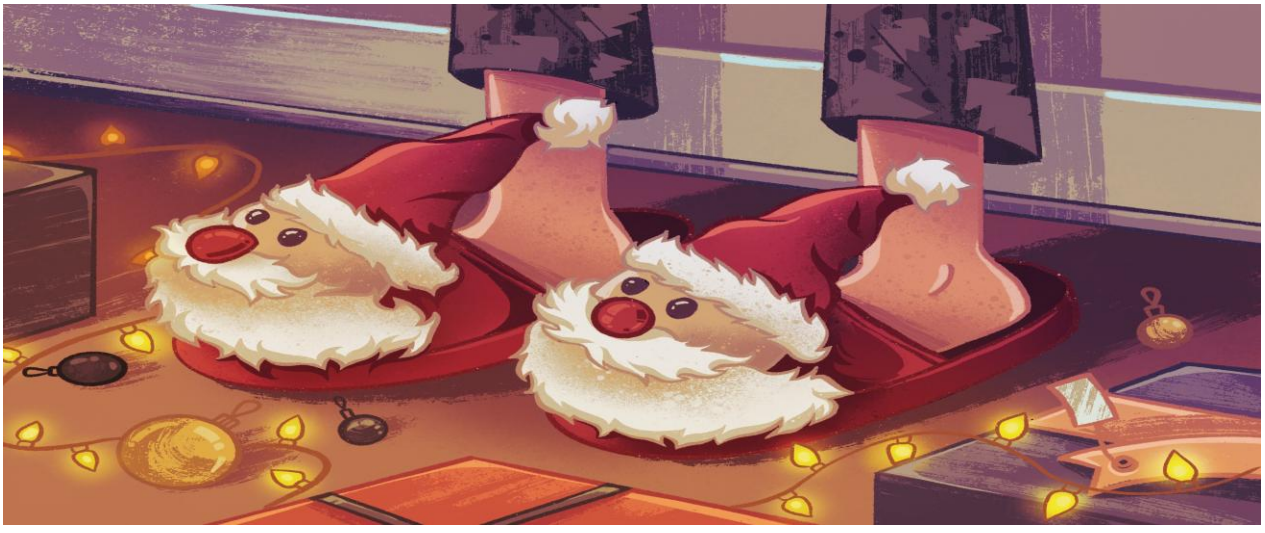
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Lost Mining Newspapers of Western Washington State

By Sal Noeldner

Part I: Beginning with the Olympic Peninsula

As mineral-culture researchers well know, snippets in old texts can not only spur the passion of mineral collecting but also fill gaps in the local culture of mineral-related lore. Mineral discoveries of all types and sizes are often recorded within small town newspapers as one never knew what the next “big thing” may be. The author has found mention of a number of mining-related publications printed in towns of western Washington State during the late 1800’s through early 1900’s of which no existent copies are known to local archives. Perhaps this is not so strange in a temperate climate filled with fungi and mice, where drafty log or plank-built homes have been traditionally heated by (always hungry) woodstoves. Due to the large extent of unknown historical material, current and future researchers will want to keep an eye out for these meager publications (in bold and underlined):

Milton Satterlee at the building where the Olympic Mining Record was printed at Quilcene, Washington. (Jefferson County Historical Society)

The **Olympic Mining Record** was recorded by multiple newspaper directories as being edited and published by Milton F. Satterlee & Son (1,2) on Saturdays in Quilcene for an unknown duration during 1897-9. Earlier that decade, Milton had come from Wisconsin as the former printer of the Owl “the most unusual paper

ever published in Clark County, Wisconsin…combining…tramp print[ing] with the genius and brilliance of an able writer" (3). Satterlee saw an opportunity in promotion of local interests and decided to harness the flowing water of a "sparkling mountain stream that flows in front of the office and then empties into the bay" (from the first newspaper printed in the building and excerpted in Brandon (one of his sons) Satterlee's 1952 work [4]), partially diverted to a flume to rotate an overshot waterwheel which lit and operated the tiny print shop for less than four years until economic depression stopped the press; from 1891-1894 **The Quilcene Queen** was the product with few issues surviving. For nearly 3 years, the hamlet of Quilcene eeked along without a newspaper until an increase of mining excitement in the area due to Puget Sound acting as the entrance to the Klondike Gold Rush reawakened possibilities of local mineral exploration along mossy, rushing rivers which carved deep valleys in the surrounding Olympic Mountains.

This breath of new life propelled Satterlee to once again allow the creek-operated press to rotate, producing written content under a different name showing the sign of the times. By (at least) June 19th of 1897 (5), the **Record** had begun as a 6-page issue with 3-columns a page (6). Evidently showing some success, the 1898 **N.W. Ayer's and Sons Newspaper Annual**, on pg. 832, records the newspaper as a slightly longer, 8-page, 9"x 12" print available for a one-dollar subscription on Saturdays. The 1899 edition of Pettingill & Co.'s newspaper directory records it, but the other newspaper directories do not so either it is a mistake or the print run lasted through early 1899. What local issues or discoveries Milton elaborated upon in the **Record** are unknown as no known issues have survived! Strangely, no mention of its existence was made in the history of the family in Quilcene (4) but this may not be unusual as the **Quilcene Queen** and Port Townsend printing efforts were also not referred to. A 1902 article refers to "half a dozen" printing efforts by that time. (7). Either way, production of this ephemeral mining **Record** was bracketed by the more popular printing endeavors of the family in Quilcene beginning with the Quilcene Queen (1891-4) and ending with the **Megaphone** (1909-1918).

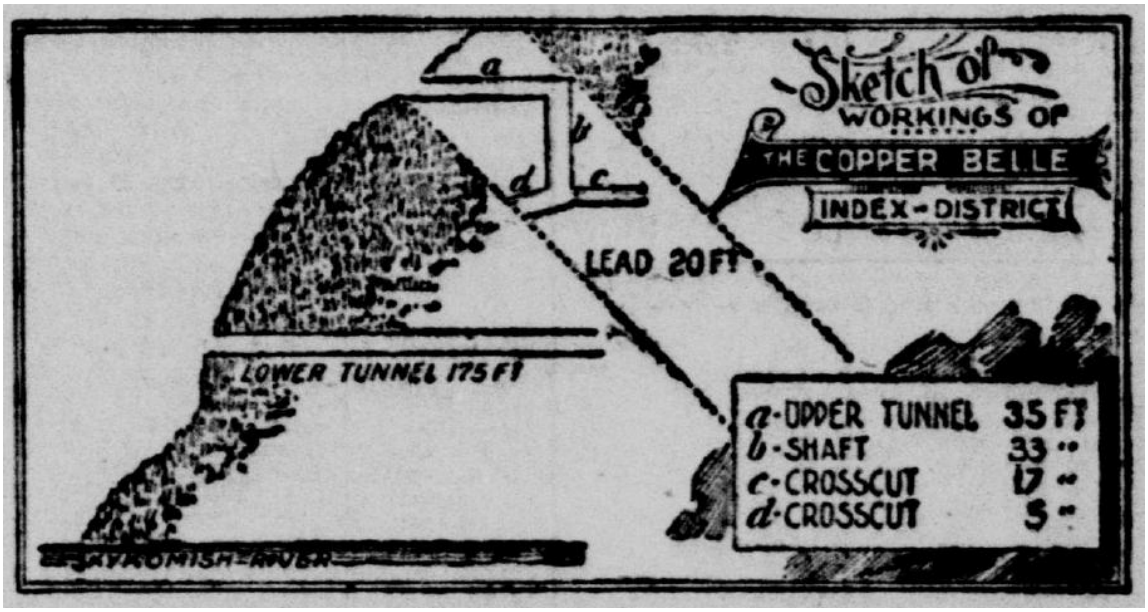
Just up the way from Quilcene in Irondale, an enthusiastic mineral prospector and promoter Charles A. Dinsmore began publishing both the ephemeral **Port Hadlock News** and the **Olympic Miner** sometime in early to mid-1897. This short-lived industrial center was started to smelt iron made from mixing bog iron ore and iron silicates sourced locally, an idea which quickly changed to the smelter becoming a receiving and mixing center for other iron ores sourced from multiple places including the skarns of Texada Island, B.C. A full article quoted in the May 25th edition of The Tacoma Daily Ledger is the first mention of the **Olympic Miner**'s existence.

Ephemeral excitement in Irondale waned and after an unknown number of printed editions of these newspapers, Charles moved southward along Hood's Canal to Brinnon where on August 5 (8), he continued printing the **Olympic Miner** on Thursdays in 4 pages of 9" x 11" format, each holding 4 columns (6). A busy individual, he used the new location to his advantage and traveled often up the Dosewallips River valley to prospect for mineral locations and record the mining efforts of others. He evidently enjoyed this area as the Sept. 6th issue of the **Seattle-Post Intelligencer** records correspondence from a "Hadlock Miner" regarding the Dosewallips to Elwha route as best for a cross-peninsula road from the canal to the ocean (anyone who may have walked the upper valley may question the veracity of this idea). Whether or not this named **Miner** was a different publication out of Hadlock proper or was simply the **Olympic Miner** misnamed with a blend of the publisher's previous effort is cause for conjecture, but certainly this was a grand promotional scheme supported by Charles.

Some cabin fever must have set in; the next month found him promoting a local change of industry from farming/lumbering to mining as a priority early in 1898 with an article created for readers of the P-I (9); perhaps Charles was expressing his personal bias, now holding interest in multiple mineral claims nearby. Later during the year, he was recorded riding a steamer up and down Hood's Canal increasing subscribers by over 100 homes along this thoroughfare of a maritime highway; unfortunately, we do not know the total subscriber count.

We do know the only recorded physical copy of the paper was found half-swallowed by a shark with an interest in anthropomorphic goods (10). Signs of increasing mail-delivery disturbance were seen near the end of the run, the **Mason County Journal** reporting subscriber complaints concerning recently late or absent issues (11), not helping business. To further interest movement from abroad and subsequent settlement in the area, Dinsmore wrote local, mineral-related correspondence for multiple newspapers, both local (**Seattle P-I**) and abroad (**The New York Sun**) (12). Unfortunately, this additional effort, when added to meager subscriptions and few advertisers, the **Miner** did not evidently pay the bills, as Charles was reported moving to Seattle where the last issue of the **Miner** was published on December 9, 1898 (13).

He began with a January issue of the **Seattle Mining Record**, a new publishing effort of 4 columns on 8 pages in 10.5" x 14" format (14, 15) that continued as a monthly newspaper for half a year. Photos, maps, and special articles could be expected; the June 19 edition included the first installment of the lauded "Department of Mineralogy" feature by Professor Henry Landes of the UW.



Map of the Copper Belle Mine near Reiter from the June 19th, 1899 issue of the **Seattle Mining Record**.

Complicating the start record of the **Record**, the British Columbia **Atlin Claim** of Aug. 12, 1899, refers to the "young" **Record**, which does throw some doubt into the actual start date of the newspaper especially as exactly one week later, in the Aug. 19 issue of the **P-I**, it was announced that "hereafter" the **Record** would become a weekly newspaper offering semi-monthly mine reports (14). Evidently these changes enabled Charles to sell the paper early to mid-1900 to William Van Waters and Spurgeon C. Wheeler (16) who, in early 1901, sold to Charles W. Angel (who was listed as editor and publisher by N. W. Ayer for 3 years during 1901-3).

Dinsmore once again packed up the printing shop and moved to Idaho to print the monthly **Idaho Mining Journal**, beginning in March 1900 (17). Even after moving, he continued to submit updates as a continuing correspondent for the **Record**. However, still showing meager success with a circulation of less than 1,000 issues, the issuance changed to a monthly, subscriber-based format, issued on Saturdays. An article from the last known publication of the newspaper was quoted in the 1902 April 20th edition of The **Seattle Sunday Times**; however, in the June 1 **Seattle Daily Times**, in "Mining Notes", it is mentioned that the

"Northwestern Miner, Manufacturer and Metallurgist" has purchased the **Mining Record**…(and) consolidated as one".

Mineral collectors and other researchers can hope to eventually read more about the Olympic Peninsula's early mineral and cultural lore one day if issues surface in a corner of an attic or ensconced within a wall.

To be continued…

**Special thanks to the Special Collections Department at the Seattle Public Library.

Olympic Mining Record	June 19 (?), 1897 - late 1898 or early 1899	(45+ issues)
Port Hadlock News	late 1896 or early 1897 - mid 1897	(1+ issues)
Olympic Miner	May 20 (?), 1897- December 8, 1898	(63 issues)
Seattle Mining Record	January 1898- April (or May) 1902	(50-52 issues)

Bibliography

1) *N.W. Ayer & Sons American Newspaper Annual* (Philadelphia: NW Ayer & Son, 1898), p. 832.

2) *Pettingill & Co. National Newspaper Directory and Gazetteer* (Boston and New York: Pettingill & Co., 1899), p. 594.

3) Franklyn Curtiss-Wedge *History of Clark County* (Chicago and Winona: H.C. Cooper, JR, & Co, 1918), p. 148.

4) Brandon Satterlee *The Dub of South Burlap* (New York: Exposition Press, 1952)

5) *The Washington Standard*, June 25, 1897, p. 1.

6) *The Seattle Daily Times*, December 19, 1897, p. 12.

7) *Port Townsend Daily Leader*, November 2, 1902, p.2.

8) *The Mason County Journal*, August 13, 1897, p. 3.

9) *The Seattle Post-Intelligencer*, February 2, 1898, p. 4.

10) *The Mason County Journal*, March 25, 1898, p.3.

11) *The Mason County Journal*, September 23, 1898, p.3.

12) *The Mason County Journal*, January 28, 1898, p.3.

13) *The Mason County Journal*, December 16, 1898, p. 3.

14) *Geo. P. Rowell & Co. American Newspaper Directory* (New York: Geo. P. Rowell & Co., 1899), p. 1072.

15) *The Stroller's Weekly and Douglas Island News*, February 1, 1899, p. 8.

16) *Polk's 15th Seattle City Directory* (Seattle: Polk's Seattle Directory Co., 1901), p. 1048.

17) *Salt Lake Mining Review*, April 30, 1900, p. 20.

Merry Christmas

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Mineral Corner—Pride from member collections.

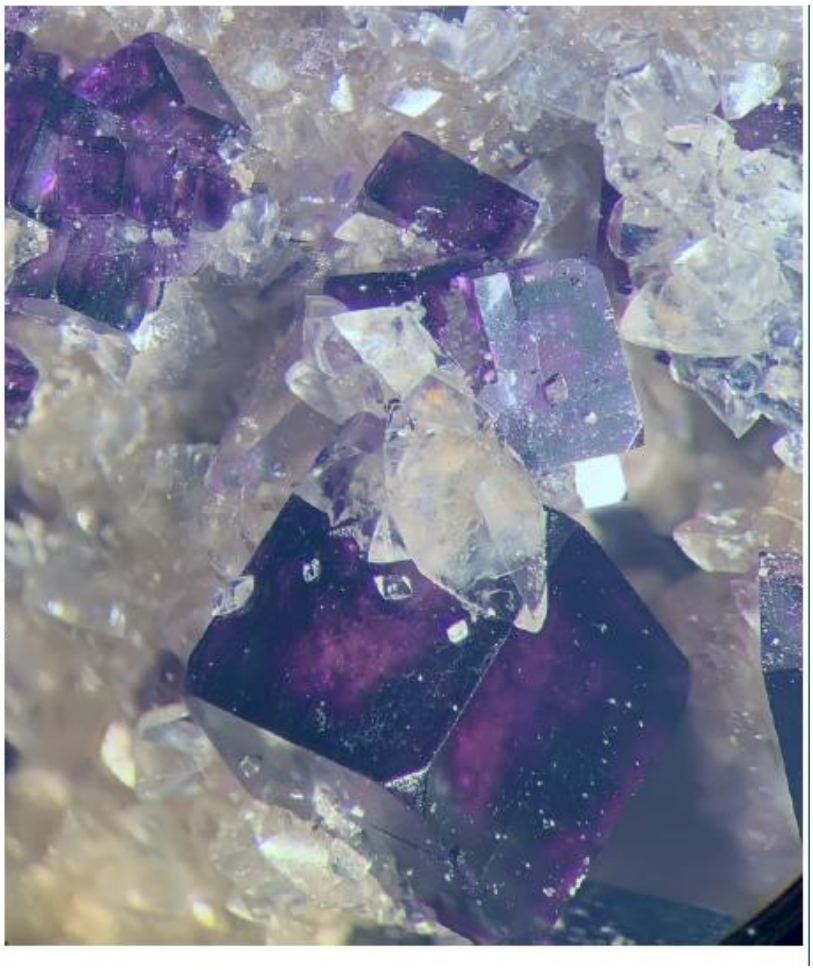
Fluorite — Marblehead Quarry, Marblehead, Ottawa Co., Ohio, USA

Marblehead quarry is one of the largest (with 2500 acres of land) and highest volume quarries in Ohio and on the Great Lakes, producing over 4 million tons of construction aggregates annually. Much of this material is transported to customers via lake freighters.

The operation mines the Marblehead Member, Columbus Limestone, Eifelian Stage, lower Middle Devonian

The Columbus Limestone is a significant carbonate unit in the Devonian of central and northern Ohio. It's part of a much more widespread sheet of Devonian carbonates that extends from New York State to the Midwest. The Columbus Limestone represents deposition in a subtropical, shallow-water, carbonate platform environment. The rocks are principally micritic limestones, fossiliferous wackestones, and fossiliferous packstones. Some chert nodules are present in the unit.

The quarry is no stranger to Friends of Mineralogy Midwest Chapter members who for many years hunted there for crystals. While large specimens are coveted, the true beauty lies in micromounts. Numerous fossil cavities are dusted with small fluorite and baryte crystals, associated with calcite.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The crystals are dominant cubic with minor dodecahedron modifications. Some crystals are colorless transparent while other have color zoning to translucent. The purple color in fluorite primarily results from radiation-induced color centers, especially what's known as F-centers. These are defects in the crystal lattice where a fluoride ion (F^-) is missing and an electron becomes trapped in its place. This trapped electron absorbs certain wavelengths of visible light—typically in the green-yellow range—causing the crystal to appear violet or purple.

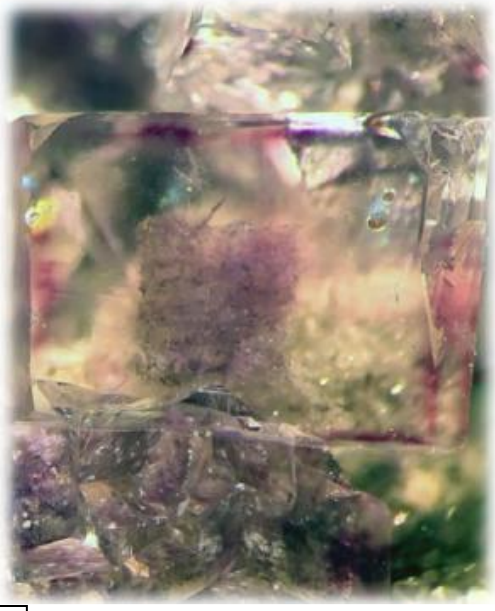
These defects are usually caused by natural radiation from surrounding rocks over geological time. The radiation displaces atoms in the fluorite structure, creating vacancies and freeing electrons that get trapped in these sites. This process modifies the crystal's light absorption without changing its chemical composition, which is why pure CaF_2 can still appear vividly colored.

Some studies also suggest a secondary role for trace elements, such as rare earth elements (e.g. yttrium, cerium), or colloidal calcium particles that may form under irradiation. However, the dominant mechanism for the purple color remains the accumulation of lattice defects due to radiation exposure. Heating or UV exposure can often "bleach" the color by releasing the trapped electrons, confirming that these centers are relatively unstable and physical—not chemical—in origin.

All specimens in the Johan Maertens collection. All images by Johan Maertens ©

Fluorite crystals 1 to 3 mm each.

To share a pride of your collection, share pictures and descriptions to Johan Maertens.



Via FM Midwest Chapter Newsletter -- September-October 2025

From Across the Pond
Courtesy of the MAGNIFICENT

British Micromount Society
Newsletter - October 2025

Editor – David Roe

Cacoxenite Fumade, Fontrieu, Tarn, France
Collection and Photo : Elise Chaigneau & Eric Penet

Bonanza at Wheal Wrey

Rupert Harrison

In early June, whilst holidaying with my wife (and dog, Pete), in Cornwall, we paid the traditional annual visit to our relatives, who farm near Menheniot. Driving west on the A390 from Callington, in the direction of Liskeard, I'd reached the section between St Ive and Merrymeet, where you descend into the heavily-wooded River Tiddy valley. Just before reaching the sharp right-hand bend at the bottom of the hill where the road crosses the bridge, I slowed and glanced in my rear view mirror to look back at the familiar track that emerges from Trebeigh Woods. This being the track that gives access to the dumps of Wheal Wrey, which adjoin the track, some 50 yards back.

Rupert finds Wheal Wrey is making tracks and is not disappointed when he follows them into the Trebeigh Woods

Having passed this way numerous times, I was already aware of the large-scale plantation deforestation which had been taking place on the steep slopes of Trebeigh Wood for several years. But this time there was something different! I noticed that the track surface had been dressed with fresh hardcore. It is common practice to reinforce unpaved tracks with hardcore where heavy timber lorries haul out their loads to the road. But as far as I could make out, the track had been resurfaced with tailings from the old mine dump. It amazes me what you can notice in a split-second glance!

Wheal Wrey (along with Wheal Ludcott) worked between 1846-1866 on the Lead/Silver/Zinc veins running several miles north/south through the killas, east of Liskeard. Other renowned 19th century mines working these loads include Wheal Mary Ann and Wheal Trelawney. I've had the privilege of collecting from these dumps numerous times over the years, but only collected a few times at Wheal Wrey. There's nothing more likely to grab the attention of an avid field collector than the excavation of an old Cornish mine tip, and this disturbance offered an un-paralleled opportunity to search material that had been buried in the dump for well over a century. With reconnaissance in-mind, I snuck away for an hour, one evening, to investigate.

The A390 here is an unforgiving, busy road at the best of times, but finding somewhere to park near to the workings is very challenging. Halfway down the hill from the top bend, there is a small scoop out of the bank. Calling it a pull-in would be generous! I parked halfway up the bank in order to reduce the car protruding into the road too far. I walked back up the hill to cross the road and drop down the opposite bank where the shaft is located. There is no engine house here, but there is a sturdy bat castle that sits atop the 108 fathom shaft, yet only 8 metres from the busy road. You wouldn't notice it! (Coincidentally, the bat castle was installed by our very own Tom Thomson!). The structure occupies a corner of what was once a small overgrown platform covered in self-seeded saplings, but was now a large, excavated expanse of raw mine waste! The whole top of the platform had been taken down several metres by the removal of dump material. From the corner, a freshly re-surfaced track led down steeply through the woods into the valley below.

So my assumption was that this is where the material for dressing the track came from. Having investigated the terrace to my satisfaction, I returned to the car and drove down the hill to park where the track emerged from the woods.

As soon as I stepped out of the car, the hardcore beneath my feet had the unmistakable look of waste from the mines of the area. Apart from the shallow ruts where the truck tyres had ground the killas into a grey dust, the sides and centre of the track abounded with likely-looking material. A mixed jumble of large chunks of grey killas and white Chalcedony. The light of the evening sun on the slightly dampened track from earlier rain illuminated translucent coverings of massive pale green/blue fluorite. Here and there, half-brick sized chunks of pure fluorite speckled with bright cleavages of galena and chalcopyrite crystals, glowed in the evening light. Also catching the light were sizeable chunks of calcite festooned with vughs containing numerous gemmy, prismatic, water-clear calcite crystals. I could not tell how far back the track had been dressed, but given that my time there was limited, I did not have time to explore further that evening. But I vowed to return to the site as soon as possible, before the bonanza became more widely known about.

As luck would have it, that opportunity presented itself within two weeks of my first visit. I left home very early to miss the busy weekend M5/A30 traffic and arrived on-site exactly two hours later. The gate was closed and chained, which meant no works were ongoing on the day, so I parked in the entrance. This is a public footpath, so I felt at liberty to explore and collect without concern, which I did for four hours, undisturbed, without seeing a soul. As the hours passed, there were a few rumblings of thunder and some very light mizzle, plus a few horse flies to fend-off. But for the most part, the day was very warm, sunny and peaceful. I soon realised that the track had only been dressed for about the first 80 yards, but this offered plenty of material to investigate, given the time constraints.

The following is a brief summary of what I collected:

Fluorite - The pale green/blue fluorite was abundant, but I collected some with patches of a pure mid-blue. Given the journey the spoil had taken, I did not expect to find any undamaged cubes, but I did find one specimen with a pale green cube to about 5-6mm sitting nicely on matrix. I also recovered a specimen comprising green fluorite, but in a section displaying octahedrons, partially coated in drusy white quartz, and displaying layered epimorphism, similar to those found at Wheal Mary Ann.

Calcite - Most collectors will be aware of the wonderful specimens of calcite from Wheal Wrey, comprising groups of sizeable, water-clear prisms, recovered from the mine in the 19th century and now held in national collections, worldwide. Calcite is certainly far more abundant here than at the Wheal Mary Ann end of the lode. I recovered a small number of very nice calcite specimens displaying both flat and nail-head prisms. I also recovered a huge crystalline mass of calcite with fairly well developed patches of honey-coloured crystals. Under LWUV, these patches glow a ghostly pale orange, but a bright green phosphorescence which decays slowly when the light source is removed. I think these are probably baryte.

Sphalerite - Yellow/orange sphalerite was fairly abundant, and even in some sizeable, although somewhat bruised, crystals. Mostly, it is seen as cleaved crystal sections, glinting from amongst drusy clear-to-milky quartz crystals.

Galena - Galena was abundant on and within the fluorite, calcite and quartz with some in cleaved masses up to several inches across. As with the sphalerite, the best crystals to survive intact were the tiny ones!

Pyrite and Chalcopyrite - Pyrite and chalcopyrite were both found in well-crystalised druses amongst the fluorite, calcite and quartz.

Marcasite - Although I haven't really had much time to examine under the microscope all the specimens recovered, I did notice a pair of small, twinned marcasite crystals (<0.5mm) sitting in a depression on a hand-sized fluorite/calcite specimen.

I took the opportunity to notify collectors nearby of the occurrence. One was aware and had visited already. Others quickly made plans and visited in the following weeks. I may return to the site, in due course, as apparently, there are more track dressings further up the valley.

Looking back it was a lucky coincidence that I spotted the track in the first place, and wonderful that so much good quality material was accessible, all in all it gave an enjoyable day's collecting.

Phosphates from Fumade

Elise Chaigneau, Philippe Rémy and Eric Penet

As many of you were interested in the beautiful phosphates from the Fumade area at the Symposium in 2024, I though it would be a great idea to write an article about this classic French mineral site. I won't be able to stick to just one of our visits because we've done several in recent years and I have to say that it's an emotional lift every time !

We are given a warm welcome in the beautiful hills of the Tarn and get an invigorating dose of gorgeous French phosphates

The Location: situated in the South of France, about 100 km east of Toulouse and about the same distance north of Carcassonne. It is in the commune of Fontrieu in the department of Tarn, where the Fumade farm is located in the Montagne Noire, in the Cambrian black shales of the Monts de Lacaune. Known for several decades to micromounters, more than sixty species have been discovered here.

This site is considered to be seasonal, as the mineralised blocks are mainly accessible after ploughing, when the soil is turned over. (Farmers remove the quartz blocks and store them in low walls or large piles at the corner of the plot). However, be aware that due to the frequent visits to the site by large numbers of mineral enthusiasts this has sometimes caused problems for the owner, particularly during the growing season for wheat and corn.

The location of the Fumade area compared to Toulouse (Mindat)

Google Map image of the Fumade farmland

History: The deposit around the Fumade farm was identified by Bureau de Recherches Géologiques et Minières (BRGM) in the 1960s and 1970s, as part of the national inventory of French mineral resources. The first samples were taken from the field around 1969, marking the start of geological studies. Nodules of black shale, enriched with brown-yellow mineralisation, were collected for in-depth laboratory analysis. It was during this research that beraunite was identified for the first time on the site. These initial results were the subject of a scientific publication in 1974, which documented the mineralogical characteristics of the deposit and drew the attention of the geological community to its interest.

Geology: As I (Elise) am not a specialist, the data presented here is taken from various published field studies, without any claim to in-depth geological expertise. The geological formations observed include the following three distinct types of mineralisation.

An example of phosphate rich nodules
Photo Elise Chaigneau & Eric Penet

First there are brown to yellow iron-rich shales containing phosphate nodules. This formation consists of black shales (K2b3), locally exhibiting slate-like characteristics. These rocks are evidence of a confined sedimentation environment with stagnant water and contain a high amount of organic matter. They also contain small, sometimes abundant, pyrite-rich sandstone beds and beds of phosphate nodules.

The black shales are approximately 100m thick and contain phosphate nodules, which are present in fields, woods and meadows.

Then there are blocks of white quartz, typical of the iron cap, containing brownish-yellow iron oxides and various secondary minerals (arsenates, phosphates, tungstates, vanadates).

And finally of interest to micromounters is the localised zone with a notable concentration of tungsten (although less widespread than the phosphate mineralisation).

Our friend and geologist Philippe Rémy, a specialist in mineral prospecting, was asked to study the geology of tungsten at Fumade in greater depth. Although this aspect of the deposit is more discrete, it has aroused considerable regional interest. Philippe has provided the following summary on the Fumade Tungsten vein deposit.

"Mining exploration work was carried out at the Fumade tungsten deposit by the Bureau de Recherches Géologiques et Minières (BRGM) from 1969 to 1978, then by the Société Nationale Elf Aquitaine Production (SNEAP) from 1980 to 1985. The conclusive results of the SNEAP campaign led to an application for a concession in 1986, known as the 'Cadoul' concession, which was granted by decree in 1988. The fall in tungsten prices that occurred after this date led to the abandonment of the mining project.

In August 2018, the Société par Actions Simplifiée (SAS) Tungstène du Narbonnais filed an application for an Exclusive Mining Research Permit (PERM) known as 'la Fabrié' for the exploration of tungsten and related substances.

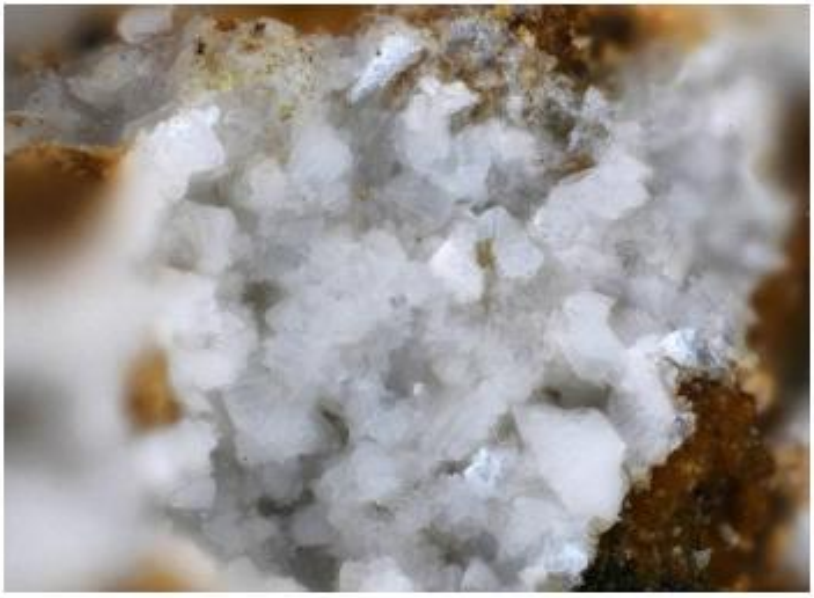
Strong opposition from local residents has slowed (if not halted) exploration!

The geological series (apart from the k2b3 phosphate black shales) consists of sandstone (k2bg), dolomite (k2a) and pelites with carbonate levels (k3), all cut by granitic intrusions visible between La Fumade and Calvayrac; these intrusions are the source of the skarns (contact metamorphism). This magmatism was accompanied by hydrothermal fluids, resulting in the formation of quartz veins and skarns (stratiform or fissure-type) containing tungsten which are the subject of mining permits.

The quartz veins contain minerals such as tungsten, lead, zinc, copper and iron. These veins intersect the black shales and are found in the fields of the Fumade sector in the form of erratic blocks piled up at the edge of the fields."

Minerals from the Phosphate area:

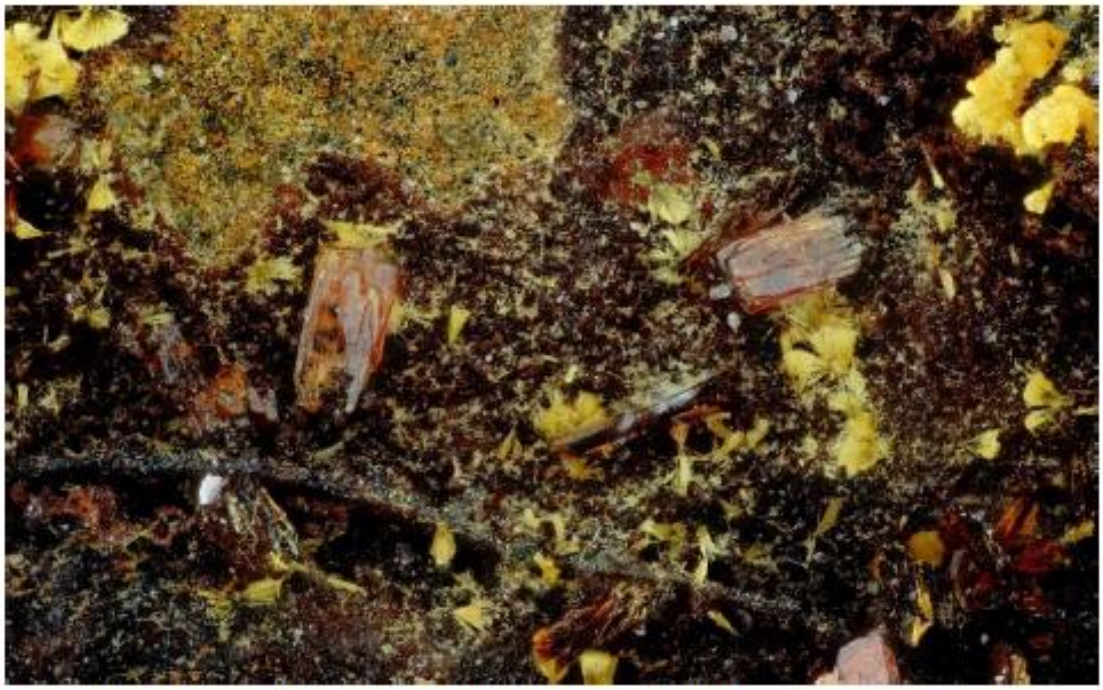
Afmite $Al_3(OH)_4(H_2O)_3(PO_4)(PO_3OH) \cdot H_2O$)



Afmite Collection and Photo: Elise Chaigneau & Eric Penet

Named in honour of the Association Française de Microminéralogie (AFM), it forms "books" or sheaves of white crystals.

Beraunite $Fe^{3+}_6(PO_4)_4O(OH)_4 \cdot \bullet 6H_2O$
Small, elongated brown to red tablets or needles often associated with cacoxenite and strengite



Beraunite and cacoxenite Collection and Photo: Elise Chaigneau & Eric Penet

Cacoxenite $Fe^{3+}_{24}AlO_6(PO_4)17(OH)_{12} \cdot \bullet 75H_2O$
Yellow to orange "sea urchins" or balls

Cacoxenite Collection and Photo : Elise Chaigneau & Eric Penet

Cacoxenite Collection and Photo: Elise Chaigneau & Eric Penet

Cacoxenite Collection and Photo: Elise Chaigneau & Eric Penet

Matulaite $(Fe^{3+}Al)Al_7(PO_4)_4(PO_3OH)_2(OH)_8(H_2O)_8 \cdot 8H_2O$

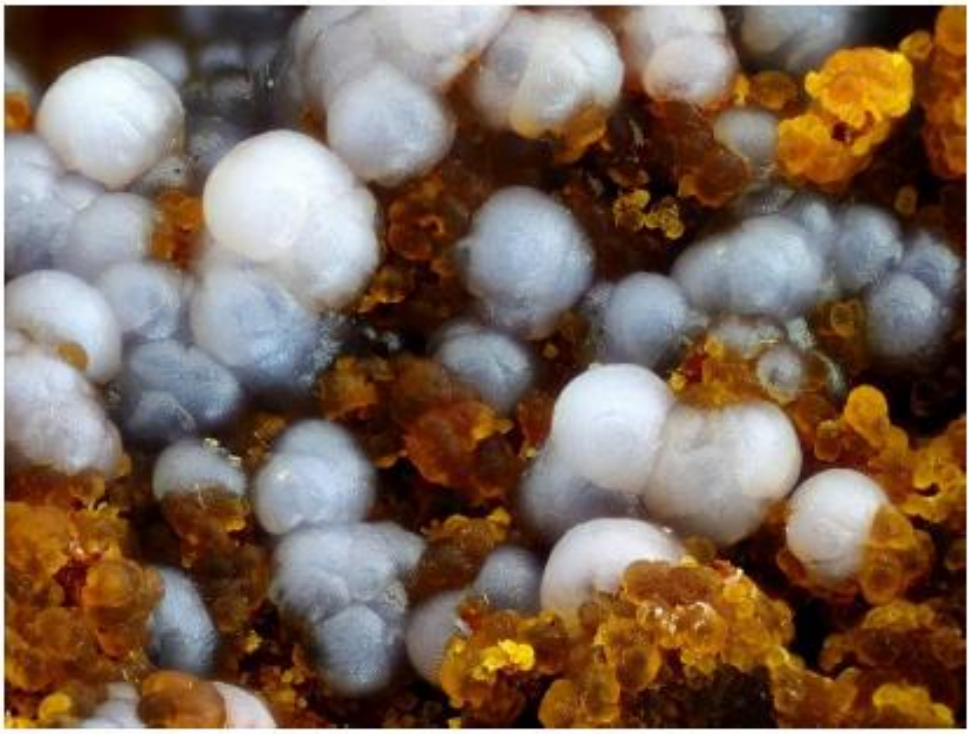
Similar in form and colour to afmite. Easily confused with afmite. Named after Margaret Matula, mineral collector from Pennsylvania where she discovered the mineral. She was elected to the Micromounters' Hall of Fame in 2002.

Matulaite Collection and Photo: Elise Chaigneau & Eric Penet

Strengite: $FePO_4 \cdot 2H_2O$

Transparent to white balls often associated with cacoxenite and beraunite

Strengite, cacoxenite and beraunite Collection and Photo: Elise Chaigneau & Eric Penet



Strengite, cacoxenite Collection and Photo: Elise Chaigneau & Eric Penet

Variscite: $AlPO_4 \cdot 2H_2O$
Small, very white, opaque balls

Variscite, beraunite Collection and Photo: Elise Chaigneau & Eric Penet

Wavellite: $Al_3(PO_4)_2(OH)_3 \cdot 5H_2O$ They appear in more or less tightly packed white to green sprays. In 2014, one block produced some superb crystals for the site!

Wavellite Collection and Photo: Elise Chaigneau et Eric Penet

Mineral from the Quartz/Tungsten Area

Beudantite: $PbFe^{3+}_3(AsO_4)(SO_4)(OH)_6$ Found in very small brown-yellow crystals; may be accompanied by **carminite** $PbFe^{3+}_2(AsO_4)_2(OH)$ red needles or sprays

Carminite Collection and Photo: Elise Chaigneau & Eric Penet

Cerussite: $PbCO_3$ Occurs in white to colourless tablets

Lepidocrocite: $Fe^{3+}O(OH)$ Brownish aggregates (analysed)

Mimetite: $Pb_5(AsO_4)_3Cl$ Quite rare, in small yellow sticks, often grouped together in clusters

Plumbogummite: $PbAl_3(PO_4)(PO_3OH)(OH)_6$ Usually in white coatings on pyromorphite

Pyromorphite: $Pb_5(PO_4)_3Cl$ Comes in the form of small barrels or needles ranging from white to green.

Pyromorphite Collection and Photo: Philippe Rémy

Pyrite: FeS_2 Found disseminated in the quartz gangue

Scorodite: $Fe^{3+}AsO_4 \cdot 2H_2O$ Spiky or tabular individual balls

Stolzite: $Pb(WO_4)$ Yellow to red tablets often on pyromorphite

Tsumcorite: $PbZn_2(AsO_4)_2 \cdot 2H_2O$ A 'probable' (not analysed) specimen found as sharp crystals grouped together in yellow sprays

Stolzite Collection and Photo: Elise Chaigneau & Eric Penet

Stolzite and pyromorphite Collection and Photo: Elise Chaigneau & Eric Penet

Conclusion : The Fumade deposit is of notable geological interest for the diversity of its phosphate and ferruginous mineralization, associated with an ancient sedimentary environment rich in organic matter. The presence of rare secondary phosphates and locally occurring tungsten gives the site a scientific and potentially economic value, which is still subject to exploration.

Please email articles and photos

to heesacker@coho.net

The next deadline will be March 11, 2026

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MINERAL MEETING CALENDAR

2026:

Pacific Micromineral Conference (MSSC) – Jan 30-Feb 1
Fallbrook Gem & Mineral Museum
123 W. Alvarado St., Fallbrook, California

NW Micro Mineral Study Group - May 9
Sons of Norway Columbia Lodge
2400 Grant St., Vancouver, WA 98660

Seattle Mineral Market – May 16-17
SATURDAY 10:00AM-6:00PM
SUNDAY 11:00AM-5:00PM
The Hangar 30 building at Magnuson Park
7400 Sand Point Way NE, Seattle, WA 98115

Northern Mineralogical Association (NCMA) - TBD
Eldorado Community Hall
6139 Pleasant Valley Rd., Eldorado, CA

PNWFM Symposium – TBD
Central Washington University and SureStay Hotel by Best Western, Ellensburg
Discovery Hall
Ellensburg, WA

NW Micro Mineral Study Group - Nov 14
Sons of Norway Columbia Lodge
2400 Grant St., Vancouver, WA 98660