



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.

BULLETIN OF FRIENDS OF MINERALOGY

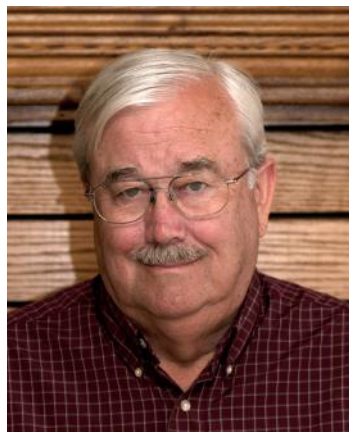
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President's Message By William W. Besse

Hello. I am the new president for National Friends of Mineralogy. As a short introduction as to who I am, I have been a mineral collector for over 40 years (starting as a field collector while taking classes towards an MS in geology), past-president of the Mineralogical Society of Southern California, and National FM board member and webmaster for the past couple of years. I hope to continue good work of my predecessor, Mark Ivan Jacobson, and thank him for his diligent work. I know he will continue working for FM where he feels needed and when asked.

I would like to welcome new board member Erin Delventhal, plus returning members Virgil Lueth, Mark Ivan Jacobson, and Linda Smith. It is good to see that we have added new board members in each of the last couple elections and I hope to see that trend continued.

During the February 16 board meeting, Alexander Schauss was elected Vice-President and Linda Smith was elected Secretary, while Gloria Staebler continues as Treasurer. The Nominating Committee for Directors-at-Large gained Erin Delventhal, Chris Whitney-Smith, and Linda Smith. The Symposium Funding Committee added Erin Delventhal, Alex Schauss, and Chris Whitney-Smith.

There are several symposia, many with field trips, already listed for this year and hopefully more to come. This is looking like it will be a full year. Unfortunately, only one symposium, New Mexico, requested and was granted financial support. The FM budget has room to support several symposia and hopefully more will make requests in the future. The guideline for requests is on the FM website, <https://www.friendsofmineralogy.org>.

Speaking of the website, it is a great tool to use for propagating information about regional chapters as well as national FM. If your chapter wants to expand its presence on the national website, send in the information and we will see how best to present it.

If you have any questions or suggestions for FM, please feel free to contact me.

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FM Annual Business Meeting – Minutes Saturday, February 16, 2019 Tucson, Arizona

Attending: William Besse, Ken Bladh, Bruce W. Bridenbecker (FM of Southern California), Don Buchanan, Erin Delventhal, Mark Jacobson, Virgil Lueth, Peter Modreski (FMCC proxy from Chapter President), Jolyon Ralph, Alexander Schauss, Linda Smith, Gloria Staebler, Chris Whitney-Smith (by proxy), and Allan Young.

1. President Jacobson called the meeting to order at 7:49am and declared a quorum present.
2. Reports from attending representatives of affiliate organizations
Jolyon Ralph – Mindat
3. Reports from officers
President Jacobson thanked all individuals who served Friends of Mineralogy during his presidency.
V.P. Virgil Lueth announced the recipients of FM awards to be announced at the TGMS banquet Saturday evening.
Secretary (*pro tem* Ken Bladh) had no report.
Treasurer Gloria Staebler distributed a one-page "Income Statement for 2018" and one-page "Balance Sheet" for 2018. Gloria provided an update on the pro bono audits underway.
4. Reports from Committees and non-elected positions
Nominating committee for Directors-at-Large presented three names: Erin Delventhal, Chris Whitney-Smith, and Linda Smith.
Symposium Funding Committee received new members: Erin Delventhal, Alex Schauss, and Chris Whitney-Smith.
5. Action Items
Unanimous approval of the request to fund \$500 to support the 40th Annual New Mexico Mineral Symposium. Virgil Lueth abstained.
The Board received the results of the recent election of 4 new Board members: Erin Delventhal, Virgil Lueth, Mark Jacobson, Linda Smith.
Nominations from members in attendance for a slate of candidates for 2019 FM officers generated Bill Besse (President), Alex Schauss (V.P.), Linda Smith (Secretary) and Gloria Staebler (Treasurer). This slate was approved unanimously.
Approved a \$2500 limit on spending to support symposia in 2019-2020 (Feb annual meeting). Board expects action on a written policy in this regard at the February 2020 annual Board meeting. The proposal funded today counts toward the \$2500 limit.
Approved a policy to continue electronic distribution of the National Newsletters directly to all members of record (nationally) and a link to all Chapter Presidents for regional

distribution (if they wish) to their members who were not on the national membership roster at the date of distribution.

Approved immediate payment of \$1000 to TGMS for memorial plaques on club display cases in honor of Kay Robertson and Marty Zinn.

Bill Besse was re-appointed Webmaster.

Board accepted President-elect Bill Besse's choice of La Fuente for the 2010 General Membership Reception and Country Inn & Suites by Carlson (705 N. Freeway) for the breakfast Board Meeting.

6. President Jacobson received thanks from the Board for his service as President of Friends of Mineralogy.

7. Meeting adjourned at 9:02am.

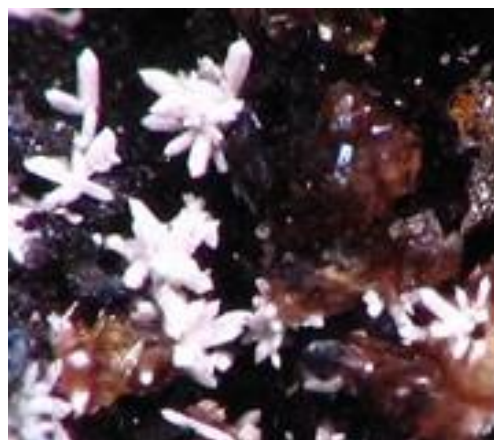
Submitted respectfully

Ken Bladh, President Midwest Chapter

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Ullmannite from Monte Narba, Sarrabus, Sardinia, Italy. Compliments of Dakota Matrix.



Ahlfelfite (cobaltoan) from Heaco Mine, Colquehaca, Bolivia. Compliments of Dakota Matrix.



Umbozerite from Lovozero Massif, Kola Peninsula, Russia. Compliments of Dakota Matrix.





# Mineral Locality Symposium

**Geology and Mineral Resources of the North Slope  
of the San Bernardino Mountains, Stoddard Ridge & Sidewinder  
Mountains NE of Victorville CA**

**Saturday, March 30, 2019**

Meet at Mojave Water Agency at 9:00 am.

**Presentations and Field Trips:**

**Saturday, March 30:** Visit OMYA White Knob Quarry

**Sunday, March 31:** Stoddard Ridge and Sidewinder Mountains

**Requirements:** Hard Hats, safety glasses, sturdy shoes or boots, and long pants are required for tours. High clearance pickups and SUVs are required. Arrive with full gas tank at the Mojave Water Agency. Bring your own lunch and beverages. Have plenty of water.

*Sponsored By*

**Southern California Friends of Mineralogy**

## **Saturday: Lecture & Field Trip Schedule**

9 to 9:30—Arrival and registration, Sign up for car-pooling

9:30 to 9:40—Welcome & Opening Remarks – Dr. Don Buchanan, SCFM President

9:40 to 10:10—Howard Brown: Geology, Mining and Fluorescent Minerals at OMYA White Knob Quarry

10:10—Break & Silent Auction

10:30 to 11:15—Howard Brown: Geology, Minerals and Mining in the Stoddard Ridge and Sidewinder Mountains area NE of Victorville

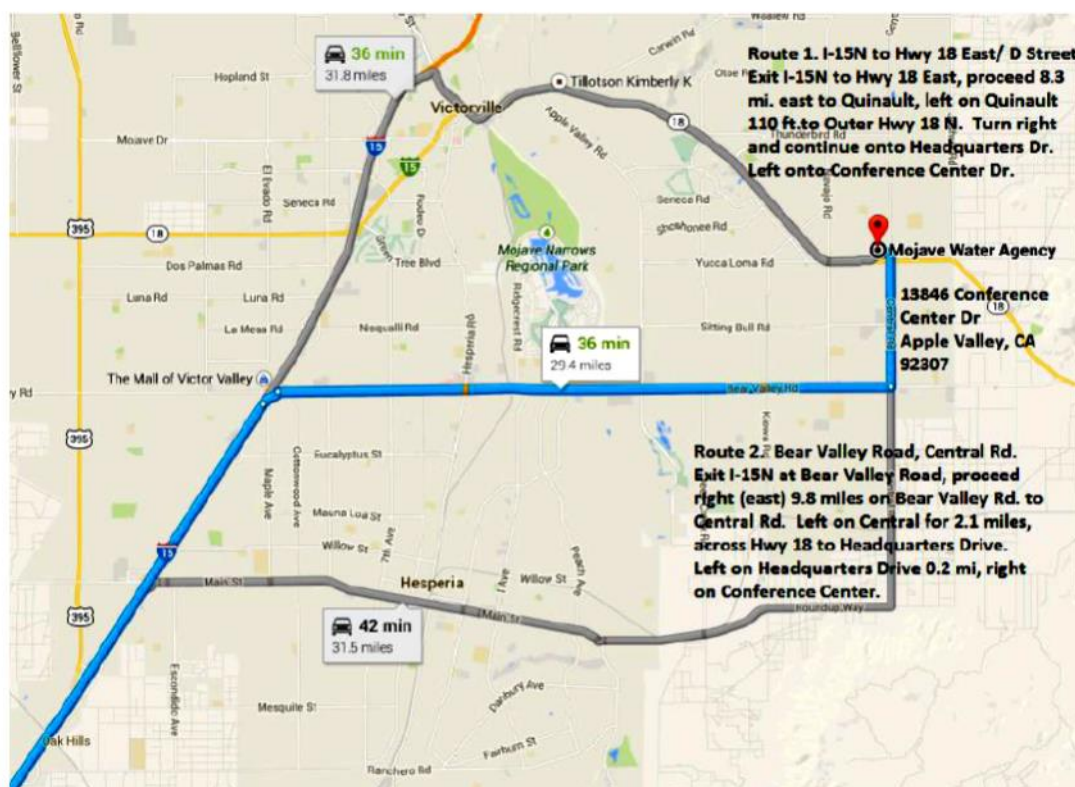
11:15 to 11:30—Field Trip Discussions

11:30 to 12:00—Close Out Silent Auction, arrange car-pools, lunch and travel to Lucerne Valley

1:00 to 4:00—Tour of OMYA White Knob Quarry in Lucerne Valley

At the OMYA plant we will have access to the conference room. OMYA can provide hard hats and safety glasses if anyone does not have one. The haul road is 6 miles of steep graded gravel: SUV or pick up truck recommended. We will car pool from the OMYA plant to the quarry. Directions to Omya and Sunday field trip locations will be provided at Saturday morning symposium.

**Directions and map to Mojave Water Agency:** Travel to Mojave Water Agency (MWA) – 13846 Conference Center Drive, Apple Valley, 92307  
 From I-15 take Hwy 18 exit in Victorville and go east approximately 10 miles to Central St. (traffic light there). Turn left past Chevron Station and take first left; MWA office is next to Fire Station. Turn right past Fire Station and left into parking area. Call Don Buchanan at (909) 499-5211 if lost.





## The Friends of Mineralogy Institutional Educational Display Award at the 2019 Tucson Gem and Mineral Show



The Friends of Mineralogy Institutional Educational Display award at the 2019 Tucson Gem and Mineral Show was given to the A. E. Seaman Museum at Michigan Technological University, Houghton. The exhibit provided a simple explanation of how wulfenite forms with examples of wulfenite and other metallic minerals that were also formed by oxidation.

Baratovite from Darai-Pioz Glacier, Alayskiy  
Range, Tien Shan Mts, Tajikistan.  
Compliments of Dakota Matrix.



## The Friends of Mineralogy Non-Institutional Educational Display Award at the 2019 Tucson Gem and Mineral Show



The Friends of Mineralogy Non-Institutional Educational Display award at the 2019 Tucson Gem and Mineral Show was given to Philip Simmons and Erin Delventhal of New Mexico. Their display highlighted the different generations of fluorite that formed at Cooks Peak and the differences in crystal morphology and color.



From the right: Philip Simmons and Erin Delventhal receiving their FM Educational display award, Saturday night dinner, February 2019, Tucson Gem and Mineral Show.





## COLORADO CHAPTER UPDATE

<http://friendsofmineralogycolorado.org/>

**Your Report could be here!**



## MIDWEST CHAPTER UPDATE

[www.fommidwest.org](http://www.fommidwest.org)

**Your Report could be here!**



## 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](http://www.pnwfm.org)

The PNWFM Symposium will be held October 18-20 at the Red Lion Hotel in Kelso, Washington. The theme this year is, "Specimen Mines of the West. The speaker list has not been finalized yet.



## PENNSYLVANIA CHAPTER UPDATE

[www.rasloto.com/FM/](http://www.rasloto.com/FM/)

### Sulfarsenide Minerals from the Kibblehouse Quarry, Perkiomenville, Montgomery County, Pennsylvania

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

#### INTRODUCTION

The Kibblehouse quarry is a large, active quarry located in Perkiomenville, Montgomery County, Pennsylvania, at 40° 19' 29" N latitude and -75° 28' 06" W longitude. The quarry is operated by Highway Materials, Inc. for aggregate and is known as their Perkiomenville quarry. The quarry is in hornfels adjacent to the Sassamansville diabase sill. The adjacent sedimentary rock was thermally metamorphosed to hornfels by the intrusion of the rift-related York Haven Diabase at 201.509 Ma (Blackburn and others, 2013).

An area on the north side of the second level of the Kibblehouse quarry was named the cobaltite corner because of the occurrence of cobaltite. The cobaltite occurrence was confined to a single metasedimentary layer about 1 foot thick, which was exposed for about 100 feet. Cobaltite occurred as grains and crystals disseminated in the rock matrix or in calcite veins. Two types of cobaltite-bearing calcite veins were recognized: (1) irregular calcite veins containing cobaltite, actinolite var. byssolite, diopside, mariolite, and titanite; and (2) planar calcite veins containing cobaltite (Montgomery, 1973).

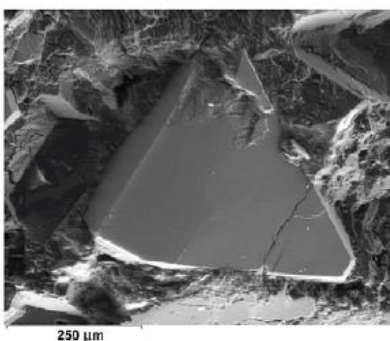
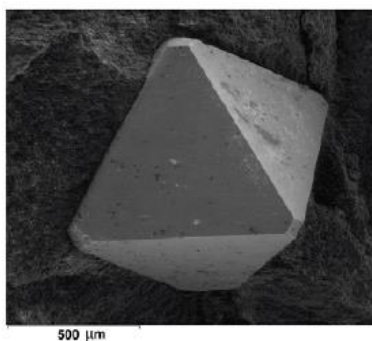
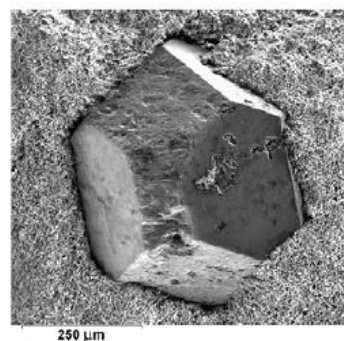
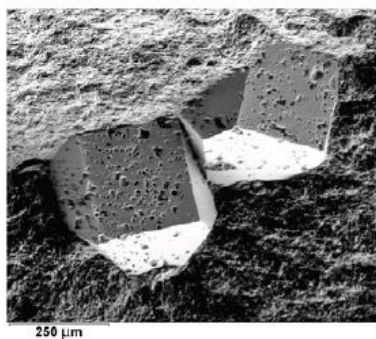
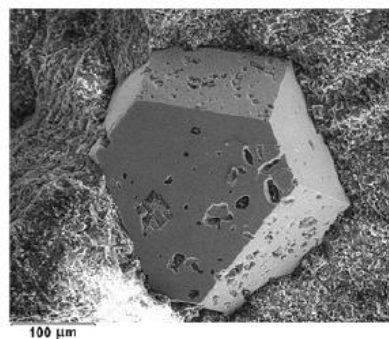
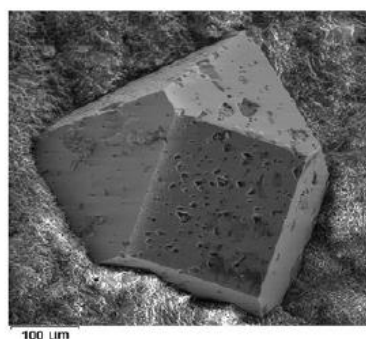
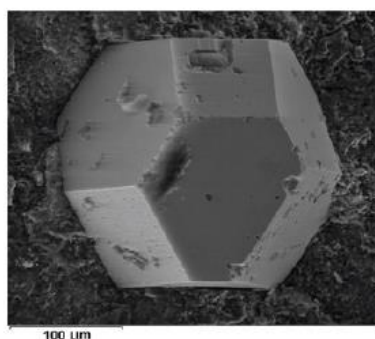
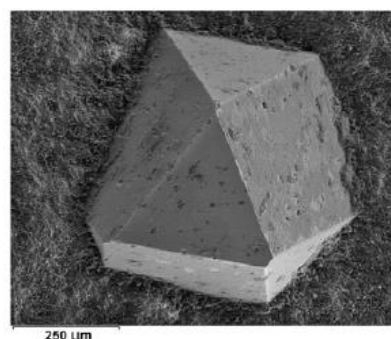
Spear and others (1978) described cobaltite from one of the irregular calcite veins. The crystals were sharp, silver-white octahedrons and cuboctahedrons to 3 mm on an edge. The cobaltite contained a number of inclusions, including silicates, carbonates, safflorite, and a bismuth sulfotelluride. Chemical analysis showed a relatively homogeneous interior of composition  $(\text{Co}_{0.3}\text{Ni}_{0.5}\text{Fe}_{0.2})\text{AsS}$  with a fairly rapid transition to an 0.1 mm-thick cobaltite rim of composition  $(\text{Co}_{0.97}\text{Ni}_{0.01}\text{Fe}_{0.02})\text{AsS}$ . The composition ranged from an  $\text{CoAsS}$  end-member cobaltite to an  $(\text{Ni}_{0.59}\text{Co}_{0.24}\text{Fe}_{0.17})\text{AsS}$  cobaltian and ferrian gersdorffite. A large, irregular-shaped inclusion in the cobaltite crystal was identified by microprobe analysis as cobalt-iron-nickel diarsenide or safflorite of composition  $(\text{Co}_{0.43}\text{Fe}_{0.34}\text{Ni}_{0.23})\text{As}_2$ .

The sulfarsenides of Fe, Co, and Ni include arsenopyrite ( $\text{FeAsS}$ ), allosclerite ( $\text{CoAs}_{1-x}\text{S}_{1-x}$ ), gersdorffite ( $\text{NiAsS}$ ), cobaltite ( $\text{CoAsS}$ ), and glaucodot  $[(\text{Co}_{0.5}\text{Fe}_{0.5})\text{AsS}]$ . Cobaltite and gersdorffite form a solid-solution series; the Ni and Co in the two minerals are substitutable. Arsenopyrite and glaucodot also form a solid-solution series; Co will substitute for some of the Fe in the arsenopyrite crystal structure.

For this study, 10 samples (fig. 1, table 1) were analyzed. Nine of the samples were labeled cobaltite, and one (RS-3828) was labeled gersdorffite. The bright silver-white cuboctahedral crystals were less than 1 mm in size.

**Table 1.** Description of analyzed samples from the Kibblehouse quarry, Perkiomenville, Montgomery County, Pa

| Sample number | Sample label | Notes                                |
|---------------|--------------|--------------------------------------|
| RS-1300       | Cobaltite    | Ex Vince and Marge Matula collection |
| RS-3602       | Cobaltite    | Ex Bill Yocum collection             |
| RS-3668       | Cobaltite    | Ex Vince and Marge Matula collection |
| RS-3669       | Cobaltite    | Ex Vince and Marge Matula collection |
| RS-3828       | Gersdorffite | Ex Vince and Marge Matula collection |
| RS-3923       | Cobaltite    | Ex Ralph Thomas collection           |
| RS-4017       | Cobaltite    | Purchased from David Garske          |
| RS-4021       | Cobaltite    | Ex Bill Yocum collection             |
| RS-4084       | Cobaltite    | Ex Bill Yocum collection             |
| RS-4085       | Cobaltite    | Ex Bill Yocum collection             |

**RS-3828****RS-3668****RS-4017****RS-1300****RS-3923****RS-3602****RS-4921****RS-4085**



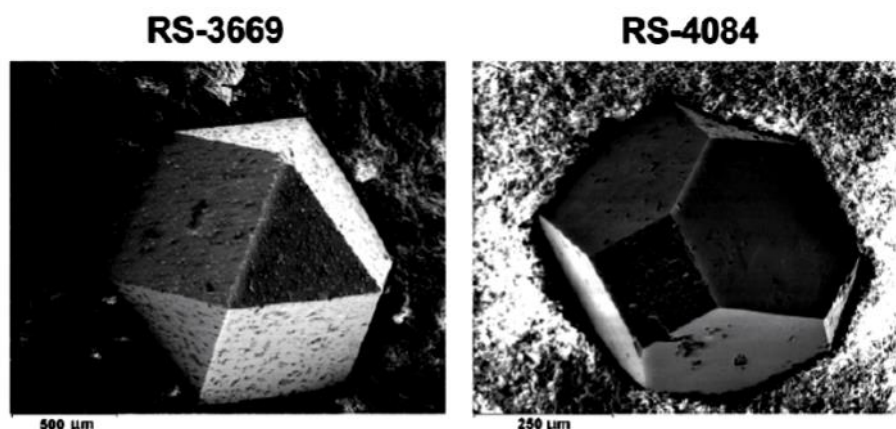


Figure 1. Sulfarsenide specimens analyzed from the Kibblehouse quarry, Perkiomenville, Montgomery County, Pa.

The samples were analyzed by scanning electron microscope/energy dispersive X-ray spectroscopy (SEM-EDS). Analyses were done on an FEI Quanta 400 environmental scanning electron microscope integrated with an Oxford AZtec X-ray energy dispersive spectrometer at the West Chester University Center for Microanalysis and Imaging, Research and Training. Samples were unpolished, uncoated crystals in matrix.

## RESULTS OF ANALYSIS

In addition to As and S, all 10 samples contained Co, Ni, and Fe (table 2) with Ni and Fe substituting for Co in the crystal matrix. Cobaltite has the ideal composition  $\text{CoAsS}$ , but significant amounts of nickel and iron may substitute for the cobalt, and sulphur and arsenic may substitute for each other (Bayliss, 1982).

The SEM-EDS data (table 2) show that the compositional variability of cobaltite, expressed as  $(\text{Co}_{0.66-0.95}\text{Ni}_{0.03-0.16}\text{Fe}_{0.02-0.23})\text{As}_{0.74-1.37}\text{S}_{0.88-1.02}$ , exhibits a well-defined trend characterized by the substitution of Co by a mixture of Ni and Fe (fig. 2). Sample RS-4085, which lies outside this trend, has about equal amounts of Co and Ni. Yang and Downs (2008) found that glaucodot was likely to have an ideal stoichiometry of  $(\text{Co}_{0.5}\text{Fe}_{0.5})\text{AsS}$ , with a limited tolerance for the variation of the Co/Fe ratio. Glaucodot is closely related to arsenopyrite in composition, crystal form, and X-ray diffraction pattern, but it contains nearly equal amounts of iron and cobalt, and its crystal structure is different from that of arsenopyrite.

## REFERENCES

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- Blackburn, T.J., and others, 2013, Zircon U-Pb geochronology links the end-Triassic extinction with the Central Atlantic Magmatic Province: *Science*, v. 340, Issue 6135, p. 941-945.
- Montgomery, Arthur, 1973, *Pennsylvania Minerals* (127): Mineralogical Society of Pennsylvania *Keystone Newsletter*, v. 22, no. 7, p. 9.
- Speer, J.A., Craig, J.R., and Hill, R.J., 1978, The "cobaltite" crystals from the Kibblehouse quarry: *Rocks and Minerals*, v. 53, no. 3, p. 130-134.
- Yang, Hexiong, and Downs, R.T., 2008, Crystal structure of glaucodot,  $(\text{Co,Fe})\text{AsS}$ , and its relationship to marcasite and arsenopyrite: *American Mineralogist*, v. 93, no. 7, p. 1183-1186.

**Table 2.** Results of X-ray energy dispersive spectrometer (EDS) analysis of 10 specimens from the Kibblehouse quarry, Perkiomenville, Montgomery County, Pa. Values are mean values in weight percent. Calculated formulas are based on the equivalent of one cobalt atom.

| Sample number | Co    | Fe    | Ni   | As    | S     | Calculated approximate formula                                                      | Mineral    |
|---------------|-------|-------|------|-------|-------|-------------------------------------------------------------------------------------|------------|
| RS-1300       | 28.24 | 4.21  | 4.02 | 45.25 | 18.28 | $(\text{Co}_{0.77}\text{Fe}_{0.12}\text{Ni}_{0.11})\text{As}_{0.97}\text{S}_{0.92}$ | Cobaltite  |
| RS-3602       | 24.86 | 2.71  | 1.33 | 50.74 | 20.35 | $(\text{Co}_{0.85}\text{Fe}_{0.10}\text{Ni}_{0.05})\text{As}_{1.37}\text{S}_{1.29}$ | Cobaltite  |
| RS-3668       | 34.35 | 2.63  | 3.54 | 41.36 | 18.13 | $(\text{Co}_{0.84}\text{Fe}_{0.07}\text{Ni}_{0.09})\text{As}_{0.80}\text{S}_{0.82}$ | Cobaltite  |
| RS-3669       | 19.65 | 5.25  | 4.80 | 51.08 | 19.23 | $(\text{Co}_{0.66}\text{Fe}_{0.18}\text{Ni}_{0.16})\text{As}_{1.34}\text{S}_{1.18}$ | Cobaltite  |
| RS-3828       | 35.57 | 0.68  | 1.12 | 43.81 | 18.82 | $(\text{Co}_{0.95}\text{Fe}_{0.02}\text{Ni}_{0.03})\text{As}_{0.92}\text{S}_{0.94}$ | Cobaltite  |
| RS-3923       | 39.33 | 1.58  | 1.05 | 39.39 | 18.65 | $(\text{Co}_{0.93}\text{Fe}_{0.04}\text{Ni}_{0.03})\text{As}_{0.74}\text{S}_{0.81}$ | Cobaltite  |
| RS-4017       | 22.87 | 7.29  | 3.44 | 49.00 | 17.40 | $(\text{Co}_{0.67}\text{Fe}_{0.23}\text{Ni}_{0.10})\text{As}_{1.13}\text{S}_{0.94}$ | Cobaltite  |
| RS-4021       | 36.67 | 3.64  | 2.33 | 40.76 | 16.60 | $(\text{Co}_{0.86}\text{Fe}_{0.09}\text{Ni}_{0.05})\text{As}_{0.75}\text{S}_{0.71}$ | Cobaltite  |
| RS-4084       | 29.44 | 3.63  | 1.97 | 46.92 | 18.05 | $(\text{Co}_{0.83}\text{Fe}_{0.11}\text{Ni}_{0.06})\text{As}_{1.04}\text{S}_{0.94}$ | Cobaltite  |
| RS-4085       | 17.11 | 16.65 | 0.88 | 53.23 | 12.12 | $(\text{Co}_{0.48}\text{Fe}_{0.49}\text{Ni}_{0.03})\text{As}_{1.18}\text{S}_{0.63}$ | Glauconite |

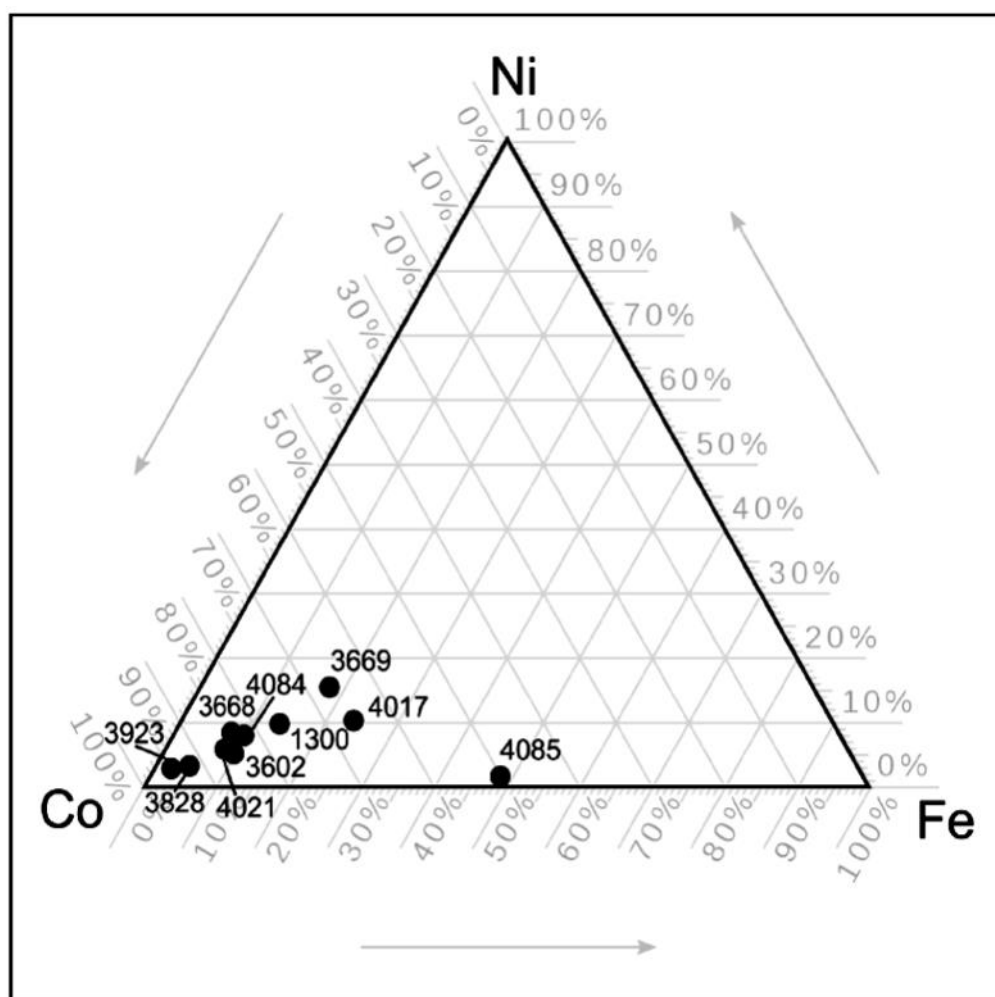


Figure 2. Ratios of cobalt, iron, and nickel in sulfarsenides from the Kibblehouse quarry, Perkiomenville, Montgomery County, Pa.





## SOUTHERN CALIFORNIA CHAPTER UPDATE

Editor's note: A portion of their Symposium Report.

### Fall Symposium, October 27-28, 2018

This fall we had the pleasure of being hosted by the San Bernardino County Museum (SBCM) in Redlands, CA. The 62 participants were educated on the history and threat of California's most famous earthquake fault - the San Andreas Fault Zone.

Saturday our speakers were as follows:

- \* Dr. Norman Meek, Geography Department Chair, California State University of San Bernardino, *"The San Andreas Fault in southern California...why worry?"*.

- \* Dr. Don Buchanan, retired geology professor, CSUSB and San Bernardino Valley College, followed with *"Mineralogy of Provinces along the San Andreas Fault Zone"* and field trip discussions with photos of minerals to be collected.

- \* Ian Gilbert, museum curator and creator of the museum's new mineral exhibit presented *"Making Minerals Rock"* before personally serving as a tour guide through the museum's Minerals Rock exhibit. Our symposium included a day pass and group tours at the San Bernardino County Museum, visiting their brand new "Mineral Exhibit" and expanded "Hall of Earth Sciences".

Lectures and demonstrations in the Hall of Earth Sciences were presented by David Kovach, Bob Reynolds, Tom & Peg Howe and Bill Casale. Our field trips on Saturday and Sunday explored metamorphic rocks on the south facing San Bernardino Mountains from Forest Falls through Cajon Pass Historic Blue Cut site to the San Gabriel Mountains at Wrightwood. CA



Image 1: A few samples of what our members donated for the semi-annual silent auction, hosted by board members Dr. Robert Housley & Marek Chorazewicz.



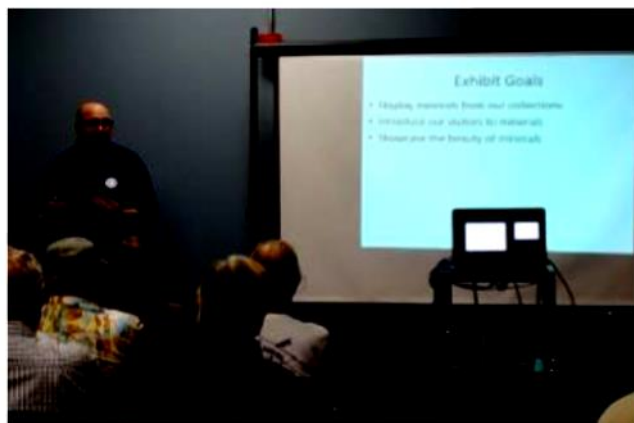


Image 2: Ian Gilbert describing the months of intricate work in assembling the minerals that best describe what the Inland Empire and the state of California are made of for this new exhibit.

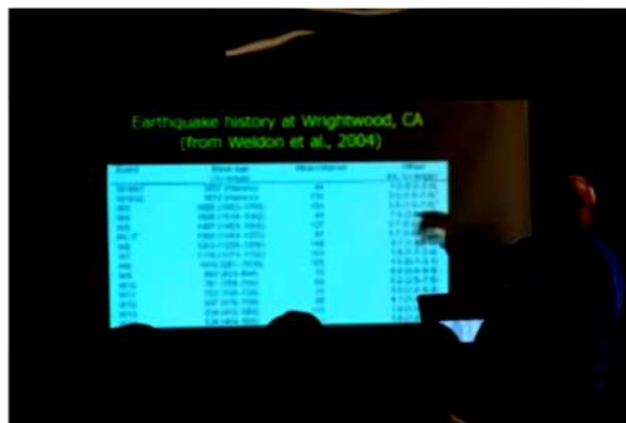


Image 3: Dr. Norman Meek showing us the seismic history of the San Andreas Fault Zone. Here Dr. Meek shows us the event, mean age, mean interval and the offset caused by the event at Wrightwood, CA.



Image 4: Dr. Don Buchanan describing our first trip of the day to the Forest Falls area where we would be collecting garnets in intrusive dikes cutting through the regional metamorphism sequence.



Image 5: Color was one display theme in this new SBCM Mineral exhibit. The display shows that minerals have a full spectrum of color.



Image 6: The Fall 2018 Symposium group photo of Southern California Friends of Mineralogy members and guests.



## **NATIONAL MEMBERS “AT-LARGE”**

**Your Report could be here!**

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

### **From Your Editor**

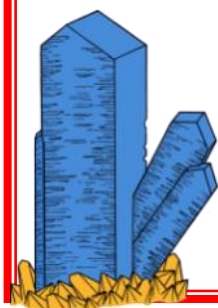
I invite all chapters and anyone from the Members At-Large to either email me their chapter newsletters or a President's report each quarter. Chapters would really like to learn from each other what is working for them or what exciting things are happening like field trips or presentations.

I request that they be emailed since I can store them in one location and not have to search around the internet for every chapter that posts theirs. Just add me to your email list. Beth Heesacker, heesacker@coho.net .

I also invite your pictures of your minerals to grace the pages of this newsletter.

Also please let me know if your President changes so I can keep the officers' page up to date.

Your articles can make this Bulletin a greater resource for mineral collectors around the world. Thank you in advance.



**Interested in a wonderful resource for teaching  
children about minerals?**

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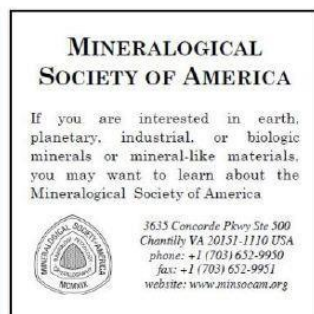
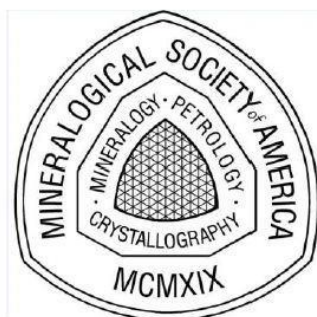
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## FM AFFILIATES



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

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



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