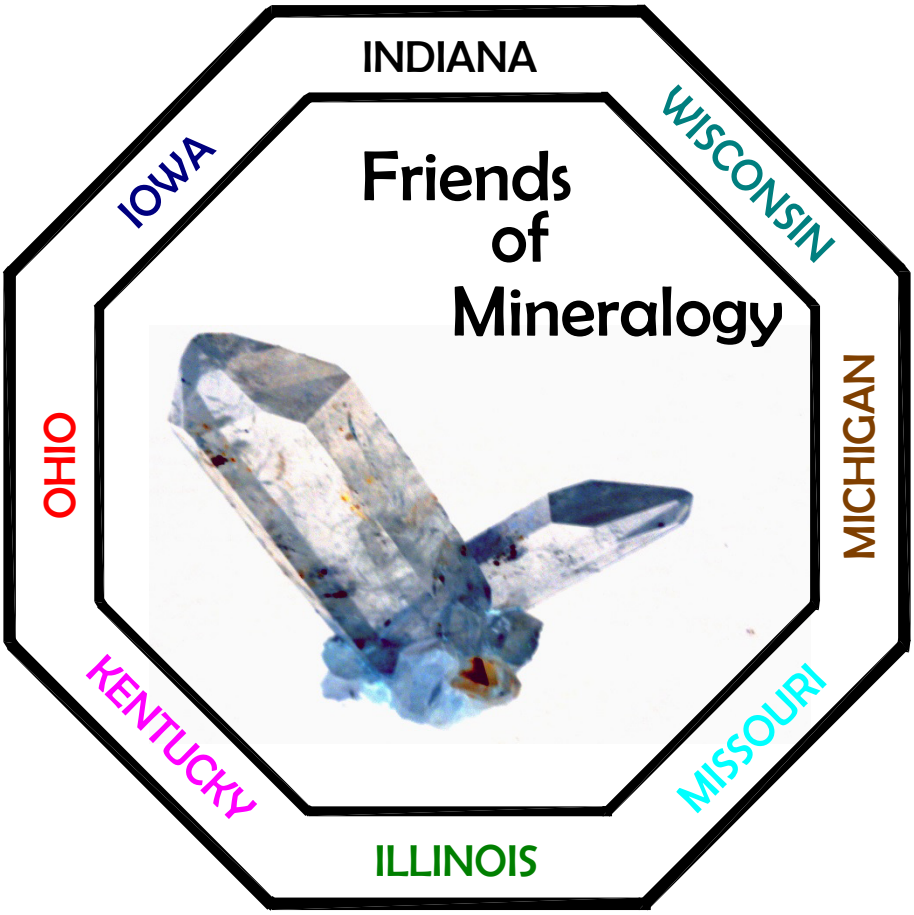
Friends of Mineralogy

Midwest Chapter Newsletter for

November – December 2014



Affiliations:

THE MINERALOGICAL RECORD

THE MINERALOGICAL SOCIETY OF AMERICA

AMERICAN GEOLOGICAL INSTITUTE

ROCKS & MINERALS MAGAZINE

Our purpose is to organize and promote interest in and knowledge of mineralogy; to advance mineralogical education; to protect and preserve mineral specimens and promote conservation of mineral localities; to further cooperation between amateur and professional and encourage collection of minerals for educational value; and to support publications about mineralogy and about the programs of kindred organizations.

Newsletter published bi-monthly in January, March, May, July, September and November. Please submit all information for publication in the newsletter by the 15th of the previous month.

Pictures of specimens from the Sterling Hill mineral museum that you might not expect - see page 5

In this Edition…..

The next FM board meeting will be on Saturday, November 8th. The meeting time is at 3:30pm. It will be held at the Cleveland Museum of Natural History. See more details on page 11 of this newsletter.

2014 Officers

President - Clyde Spencer, 1858 Robin Hood Dr., Fairborn, Ohio 45324
(937)878-9988 c_spencer123@att.net

Vice President Programs –Randy Marsh, 6152 Old Stone Ct., Hamilton, Ohio 45011
(513)515-7890 marsh.rg@pg.com.

Vice President Field Trips - Reggie Rose, 4287 Parkmead Dr. Grove City, Ohio 43123
(614)875-2675 captaino@core.com

Secretary – Vacant

Treasurer - Jeff Spencer, 4948 Beachwood Dr., Cincinnati, Ohio 45244
(513)248-0533 jspencer@jsite.com

Liaison Officer – Nelson Shaffer, Ph. D., Indiana Geological Survey
611 N. Walnut Grove Ave., Bloomington, IN 47405
Phone: 812-855-2687 shaffern@indiana.edu

Fund Raising (Committee Chair) - Vacant

Newsletter (Committee Chair) Tom Bolka, 2275 Capestrano Dr. Xenia, Ohio 45385
(937)760-6864 tbolka@att.net

Frank Konieczki – working a boulder at Walworth New York

Friends of Mineralogy

From The office of the President

Clyde Spencer

President's Message

Randy Marsh was invited to attend the Ohio Aggregates & Industrial Minerals Association (OAIMA) Safety Committee meeting September 3rd. Unfortunately, he was unable to attend. Therefore, I went in his stead. FM member Scott Kell also attended to present information about the collector-specific training that he has developed over the last 8 years. It was a smaller than expected turnout of OAIMA members. However, those present were attentive and seemed engaged. Scott handed out paper copies of slides from his training and I handed out copies of my first newsletter essay on barriers to collecting. I told them what FM was and that I was there because we were having increasing difficulty getting access to quarries for collecting. It seemed to be the general consensus that the difficulty is probably rooted in MSHA becoming more aggressive about enforcing regulations. We have seen an indication of that this year with us being asked to chock the wheels of our cars at a couple of quarries, even when parked on a level surface, at the bottom of the quarry. We were invited to staff a booth/table at the OIAMA Annual Meeting, November 13th and 14th. I told them we would see about getting volunteers to staff the table. OAIMA has formed a not-for-profit educational organization and I agreed that FM would help out with their educational activities, largely by providing speakers. It was a congenial meeting and I'm sure there will be more. One of the attendees volunteered that he had found a nice cabinet-sized piece of calcite at their quarry and offered to get us in. Reggie followed up on the lead and it resulted in a new and different field trip for this year.

This has been a busy year with a lot of 'behind-the-scenes' activity that I won't bore you with. One of the activities, alluded to above, has been to provide future MSHA safety training more tailored to collectors instead of miners. Dr. Randy Marsh, Dr. John Rakovan and I met with an MSHA employee, Paul Tyrna to discuss some of the attendant issues. Suffice it to say that your executive board earns every penny of their lucrative salaries! Speaking of which, we are still in need of someone to volunteer for the open position of secretary.

On a personal note, I spent a week in mid-September collecting in abandoned pegmatite mines in South Dakota. I have a cousin who has lived there for 50 years and knows most of the locals in the Custer area and happens to be an avid mineral collector. She can get us into mines that most other collectors don't have legal access to. I didn't collect as much material as the previous four years, but that may be just because I'm getting more selective in what I haul back.

Lastly, I want to encourage all of you to attend our annual business meeting at the Cleveland Museum of Natural History at 3:30, Saturday, November 8th. As in the past, it is being held in conjunction with the annual Micromounting Symposium. Should you be interested in attending any of the symposium, the schedule can be found at this link: https://www.cmnh.org/discover/science/mineralogy/Micromineral-Symposium . There is no fee for just attending the FM business meeting. The most important item of FM business is the election of officers for the 2015 year. However, it is a good opportunity to discuss and take action on other items of interest such as our collecting ethics.

Quarry Travel Guide for November and December

DEM BONES DEM BONES DEM FISH BONES

We have a unique opportunity to go to a new quarry. That quarry is Melvin Stone's Williamsport Quarry in New Holland, Ohio. The road to this field trip was a circuitous one. After I was unsuccessful in my attempt to get us in there a year ago, our FM president, Clyde Spencer paved the way for this trip by negotiating with the area safety expert of the company. So if you elect to go on this trip, we will be in Williamsport on the coat tails of our president, so thank him.

If you do sign up for this trip, please do not freak out if you see some mineral matter shaped like fossils. There is also a fish bone bed at this site. What about the minerals? A year ago I walked up a rip rap filled drainage ditch outside the quarry across the road from the Deer Creek Dam and saw marcasite and calcite. In its most common forms we have seen calcite in both rhombohedral and scalenohedral forms. I have been told that there are hundreds of intermediate calcite crystal forms. The calcite here represents several of those intermediate forms.

Melvin Stone – Williamsport Plant

Field Trip Locality: Melvin Stone – Williamsport Plant
Address: 13124 Crownover Road, New Holland, OH
County: Pickaway
Date of Trip: Saturday, November 01, 2014
Time of Field Trip: 8:00 am – 12:30 pm (check-in from 8:00 am – 8:30 am)
Clubs Attending: Friends of Mineralogy Midwest
Designated Travel Point: Junction of I 71 S, exit 84 and Route 56 W (south)
Travel distance from designated point: approximately 13.7 miles
Travel time from designated point: 0:23
Age of the rocks exposed: Devonian
Rock units exposed: Columbus Limestone
Mineral specimens present: calcite, dolomite, marcasite, pyrite
Fossils present: (Paleontology by Brian Bade) The Columbus Limestone has corals (horn and colony), bryozoans, mollusks including gastropods (snails), pelecypods (clams), cephalopods, rostroconchs, brachiopods, crinoids, blastoids, trilobites, and rare bony fish plates and teeth
Training Required: MSHA
Quarry Location:
From the west:
Take I-70 east to exit 72, this is the State Route 56 exit. Take SR 56 SE into Mt. Sterling. When in Mt. Sterling you will come to the Junction of SR 56 and SR 62, turn right (south) onto SR62. After a short distance you will come to a Y in the road, the right branch of the Y is Route 62 W. The left branch is Route 207 south. Take the left branch, 207 S. Along the way you will pass through the town of Pancoastburg. After entering Pancoastburg, continue south on 207S for about 3.0 miles where you will turn left onto Mouser Road. This road runs NE then north, take it until it dead ends into Crownover Road approximately 1.5 miles later. At the dead end, turn right (SE) onto Crownover Road. The entrance to the quarry will be about 500 yards on the left. The quarry is adjacent to Deer Creek Reservoir.

From south, north and east of Columbus: access I-71 S to exit 84 which is State Route 56. Take SR 56 into Mt. Sterling and pick up the directions from there.

WHERE'S THE PIZZA?

We are on our way to Genoa, so where's the pizza? We are going to Genoa, Ohio not Genoa, Italy. You can get pizza anywhere (as evidenced by FM's recent trip to NY, home of some of the nation's finest pie), but the Genoa in Ohio is the home of our friend celestine and all his accessory buddies.

Graymont Dolime – Genoa, Ohio

Field Trip Locality: Graymont Dolime, Genoa, OH
Address: 21880 West State Road 163, Genoa, OH 43430
Date of Trip: Saturday November 15, 2014; there is a limit on this trip
Time of Field Trip: 8:00 am – 1:00 pm; check-in from 7:30 am – 8:00 am
Travel Distance (from Grove City, OH, exit 100): 129 miles
Travel Time (from Grove City, OH, exit 100): 2:45
Age of Rock: Middle Silurian
Rock Units: Lockport Dolomite
Specimens Present: Genoa is noted for bladed celestite and cubic brown fluorite in pockets of the dolomite. Also present are sphalerite, dolomite, calcite, pyrite, galena and marcasite.
Training Required: MSHA
Quarry Location: The quarry can be reached from U.S. 20 & U.S. 23 at Stony Ridge by turning NE and then east on Ohio State Route 163 to Genoa, a little more than 7 miles. Continue through Genoa on route 163 and turn south on Graymont Quarry Road (the north entrance).
From the south, come up through Ohio on U.S. Route 23. At the junction of Routes 23 & 20 go straight on Fostoria Road. After about 2.7 miles, turn right (east) onto Genoa Road (SR163). 2.2 miles later you will enter the town of Genoa. In approximately 0.7 of a mile turn right (SE) onto Graymont Quarry Road. The quarry office is 0.3 miles down this road.
If you are accessing Graymont via I-75, use exit 179, U.S. route 6. Take Route 6 east for about 12 miles to its Junction with Route 23. Then proceed north on route 23 for about 9 miles to its junction with Route 20. From there see directions above.


Two beautiful fluorite Specimens from Sterling Hill Mine's (New Jersey) mineral collection.
This mine is noted for its fluorescent minerals but its museum and mine tour are excellent.

Field Trip Reports

"Start spreadin' the news" is the opening phrase to the song "New York, New York" made famous by Sinatra and heard at Yankee games for the last two decades. Why mention New York? Because FM midwest was well represented at the Dolomite Group's Open House in Walworth, NY. Five brave souls took hit the road for various but long distances to the empire state. From central Ohio, Walworth is 421 miles. The good news is that the open house was in Walworth, not NYC as the song honors. If you were traveling to NYC from central Ohio, the quarry would be the half-way mark! The driving distance is probably three times what we usually drive to an average field trip in our region. The Walworth quarry is open for 12 hours, which is three times the collecting time of our typical trip. Last year, 140 collectors attended the annual affair. This year attendance was down. As advertised, the quarry used its hydraulic rock pecker to break up boulders which interested collectors, and children got their rides in the big quarry haul truck.

On Saturday FM Midwest was represented by Don Hollenbaugh (Parma, OH), Scott Kell (Columbus, OH), Frank Konieczyk (Bellevue, MI), Mike Royal (Defiance, OH), and Reggie Rose (Grove City, OH). The last three collectors stayed for Sunday.

As far as what we saw while we were there, saddle-shaped dolomite was the most common mineral, and it serves as a back drop for sphalerite and fluorite. The sphalerite displayed reddish, gemmy crystals and also amber, glassy, more massive crystals. Though I saw yellow and purple fluorite there last year, this year our group saw mostly clear to clear blue cubes.

The dolomite is mostly white, but sometimes is pink, and sometimes has a reddish iron stain. Calcite was present in clusters of tiny scalenohedron in the 2 mm. range and was white to brownish-black. Scott Kell found three large, whitish and as he described them, really crappy looking celestine blades, free of matrix and 3" or more in length. The only thing that made the celestine interesting is that it is not listed in the specimen list for this quarry.

Brian Mcgrath is a collector fairly local to Walworth, and for FM Midwest, he could be a good friend. He owns a mineral dealership in the Rochester area called Brown Dog Natural Creations. You have probably been to shows where you look at a dealer and it is hard to picture them doing field collecting. You would probably be right, because while we are in quarries collecting, they are at shows manning a booth. Although some dealers may enjoy field collecting, they may not have the time to do it. Such is not the case with Brian. He is a sharp field collector who showed us his "small" clear blue fluorite perched in a vug, and also a nice galena sample. Mentioned above was iron-stained dolomite, sometimes this dolomite is found in dome-like masses. When it is seen in these masses, only the tips of the curved rhombs are seen, and so the domes look like ice cream mounds with reddish triangular sprinkles on top. If you look around these ferroan dolomite masses, you may see fluorite lurking inside a pocket formed by the dolomite. Brian shared a photo of what was the specimen of the weekend, a single fluorite crystal, clear, pale blue 3/4" on a side. Awesome!

It's always good to meet a new friend from the host state by comparing specimens. Brian taught us much about the quarry. And more good news comes from this trip. Frank reconnoitered the area and found us a "head quarters" motel for future trips. In addition, our quarry host has already invited us back for next year. What a weekend, new friends, good fellowship and food, a place to rest, a friendly host, and a loaded quarry. So, "start spreadin' the news" for the second weekend in October next year.

A nice Walworth fluorite (Brian McGrath – New York)

Dolomite / Calcite specimen

CLAY CENTER LIKE A WOMAN'S FURY

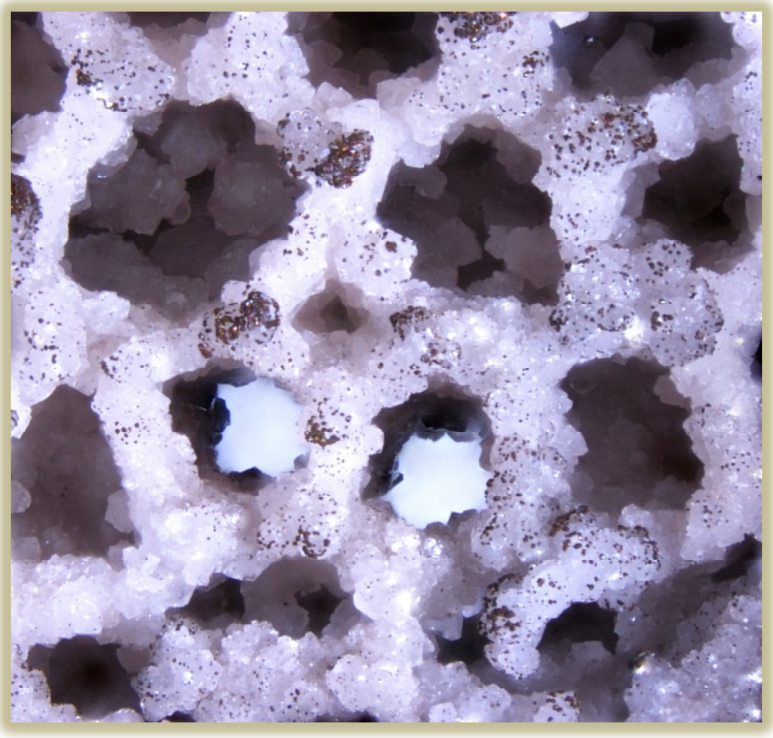
Clay Center, I will refer to the quarry in the feminine because just as battleships are referred to in the feminine and loved by their crews, Clay Center is loved by collectors. We enjoyed being with her on August 23rd. She has been a legendary, famous producer of great mineral specimens for decades. She has spoiled us for a least a six year run from 2007 – 2012 providing great production. It was easy to fill several containers with anywhere from serviceable to museum piece celestine specimens. A fluorite strike in the early 2000s made her legend grow even more. Fluorite specimens I have seen members collect here have ranged from pale to root beer brown. Celestine here can be white and thinly bladed, or pale, clear blue but blocker, with more of a crystal form like its cousin barite. Often another player on the scene is yellow calcite.

Mike Royal specimen

In addition to celestine and fluorite, Clay Center has produced some prized sphalerite, galena and dogtooth calcite specimens. In addition, fossils are sometimes found in abundance. Over the years, there has been a little something for everyone. Peterson's Field Guide of Rocks and Minerals mentions Clay Center as a classic locality for both celestite and fluorite. That's two world-class listings for one locality. That is the Clay Center we knew up through 2012.

Lately, Clay Center has been a bit cranky. There is a poem that says that there is no scorn like a woman's fury. That has been Clay Center's by-line the last two years. Specimens are not exactly jumping out of the rocks to us. One veteran FM collector has told me that the stingy Clay Center of 2013 & 2014 is more her normal state, rather than the loaded state

we had grown accustomed to prior to 2013. Nonetheless, we went back this year 25 strong, and though she was not loaded, our resourceful members still had a good time. Whatever we did wrong in 2011 to make her cranky the past 2 years, I hope that she drops her grudge and gives us some good specimens to take home.



Clay Center specimen pictures – John Rakovan

Chemical Cleaning of Minerals

By
Clyde Spencer

If it hasn't already happened, sooner or later you are going to want to try using more than just water and an old tooth brush to clean your specimens. Typically, you are trying to remove iron stains. However, you may also want to try to etch something out from the surrounding matrix.

Almost all chemicals that you will be using have an obnoxious odor, and may be corrosive to things in your house or garage, if not your lungs. Also, minerals being dissolved may give off various gases, some of them toxic. You don't want to get chemical pneumonia! Therefore, if you don't have access to a laboratory fume hood, I strongly recommend that you do your work outside. Also, you should use a face shield or at least safety glasses when pouring, stirring, or placing specimens in any solution.

One thing that you will sometimes want to do is dilute a concentrated acid with water. This can be inherently dangerous, particularly with very strong acids. Think of the acid as being hot fat in a frying pan. You should know from personal experience that if you accidently flick some water into the hot fat, the droplets of water will 'explode' (actually vaporize) with sufficient violence to splash out some of the hot fat. This can be very uncomfortable, but at least once the fat cools to skin temperature the damage is done. However, with acids, they can continue to act on your skin and clothing and will have to be washed off. Therefore, remember that **when diluting an acid you should always slowly add the acid** (hot fat analogue) **to the water**, not the other way around!

The first thing that you will want to do is to identify the minerals you will be working with and look up their chemical formulas (Try Mindat: http://www.mindat.org/), or any good printed, general reference on mineralogy. Once you know what the cations (+) and anions (-) are, then you can use the following general rules for guidelines as to the risk of dissolving or etching the species you want to keep:

All nitrates (NO_3^-) are soluble in water.
All chlorides (Cl^-) are soluble in water except Ag, Hg, and Pb.
All sulfates (SO_4^{2-}) are soluble in water except those of Ca, Sr, Ba, Hg, Pb, and Ag.
All carbonates (CO_3^{2-}) are insoluble fin water except those of the Periodic Table group (column) 1A and NH_4^+.
All hydroxides are insoluble in water except those of the Periodic Table group (column) 1A, Sr, and Ba; ($Ca(OH)_2$ is slightly soluble.)
All sulfides (S_2^-) are insoluble in water except those of the Periodic Table groups (columns) 1A and 2A, and NH_4^+.

The real world is a little more complex, but the above rules of thumb for ionic minerals provide a good indication of which minerals you don't want to wash or (especially) soak in water, unless you want to remove them.

The following information is summarized from a class handout from Adolph Pabst (UC Berkeley) many years ago, giving the solubility of some common minerals:

Mineral Solubility with Water and Common Strong Acids

Water	HCl (non-opaques)	HCl (opaques)	HCl with Silica Residue	HCl with Difficulty	HNO_3	H_2SO_4 with Difficulty	Aqua Regia
Borax	Apatite	Alabandite	Analcime	Anhydrite	Argentite	Alunite	Cinnabar
Chalcanthite	Aragonite	Braunite	Anorthite	Fluorite	Arsenopyrite	Amblygonite	Gold
Epsonite	Atacamite	Franklinite	Biotite	Hematite	Bismuthinite	Chlorite	Orpiment
Halite	Azurite	Galena	Chabazite	Ilmenite	Bornite	Monazite	Platinum
Melanterite	Brochantite	Goethite	Chrondrodite	Magnetite	Chalcocite	Pyrophyllite	Wolframite
Nitratine	Brucite	Greenockite	Chrysocolla	Turquois	Chalcopyrite	Staurolite	
Sylvite	Calcite	Hausmannite	Cordierite	Wavellite	Cobaltite	Topaz	
Thenardite	Carnotite	Heterogenite	Datolite		Copper		
	Cerussite	Jamesonite	Garnierite		Covellite		
	Colemanite	Limonite	Hemimorphite		Cuprite		
	Crocoite	Manganite	Leucite		Descloizite		
	Cryolite	Oldhamite	Natrolite		Enargite		
	Dolomite	Psilomelane	Nepheline		Marcasite		
	Gypsum	Pyrolusite	Olivine		Mercury		
	Jarosite	Pyrrhotite	Pectolite		Molybdenite		
	Magnesite	Sphalerite	Rhodonite		Niccolite		
	Malachite	Stibnite	Scapolite		Pyrargyrite		
	Rhodochrosite	Trolite	Sepiolite		Pyrite		
	Siderite	Wurtzite	Serpentine		Realgar		
	Smithsonite	Zinkenite	Sodalite		Silver		
	Strontianite		Stilbite		Smaltite		
	Ulexite		Willemite		Tetrahedrite		
	Witherite		Wollastonite		Vanadinite		
	Zincite						

In the course of dissolving the above minerals, many of them will give off toxic and/or offensive odors. So, once again, you don't want to do this in your house or garage!

In this day of terrorism and eco-paranoia, it is much more difficult to get chemicals than it used to be when I was young. So, you may have to be creative to come by what you need.

Hydrochloric Acid (HCl), also known as Muriatic Acid, is one of the easiest acids to come by; it is the most common swimming pool acid and can be found in stores carrying pool supplies. These same stores will frequently carry Sulfuric Acid (H_2SO_4) also. Obtaining Nitric Acid can be more challenging. It is an oxidizing agent and can be used to make explosives, so it can be harder to come by. However, I have seen it advertized for sale on eBay. Hydrofluoric acid (HF) is used for etching glass and is used in the semiconductor industry. Indeed, I have heard horror stories about people in the semiconductor industry using HF and not realizing they had absorbed the acid until there was excruciating pain that required amputation of their fingers. So, I would advise not using HF for anything unless you have experience with using chemicals and use a fume hood and good rubber gloves.

I would be remiss to not mention Oxalic Acid. It is commonly used for removing rust from automobile radiators and engine blocks. It can be obtained from your local auto supply store. It is another tool to use for removing iron stains from insoluble minerals. However, I find that Super Iron Out (sodium dithionate), available from Wal-Mart and Home Depot, to name just two, generally works faster and better than Oxalic Acid.

Sometimes one wants a weak acid to more gently work on a specimen. Common white, household vinegar (dilute Acetic Acid) fills the bill. And, if you don't use it all, you can put it on your salad.

For more detailed descriptions of cleaning minerals I suggest that you do a search for "chemical cleaning" on http://www.mindat.org/ . For an additional method of cleaning minerals, you might find the following link to be of interest: http://www.pegworkshop.com/extras/waller/waller1.html .

I have really just scratched the surface of what is involved in the chemical cleaning of minerals. A good understanding of chemistry will be helpful, but one can generally just follow the recipes that are provided by those who are more knowledgeable.

Lastly, I suggest that you try your cleaning on a scrap piece of material rather than risk spoiling a piece that has potential for being a 'keeper.'

Good Luck!

Focus On Micromounting:
Sponsored by the Micromineral Society of The Cleveland Museum of Natural History

Friday, November 7, 2014

5 pm	Registration and setup
7 pm	Van King, *The Minerals of Newry, Oxford Co., Maine*

Saturday, November 8, 2014

8:30 am	Registration and setup
9:30 am	Pete Richards, *Growth of "Whisker" Crystals*
	Martin Held, *Minerals of the Eifel Region, Germany*
	Erich Grundel, *Mounting Techniques for Very Small Specimens*
10:50 am	Break
11 am	Workshop Session
12:30 pm	Lunch
1:30 pm	Van King, *Photographic Mineralogy of Franklin and Ogdensburg, Sussex Co., New Jersey*
2:30 pm	Workshop Session
3:30 pm	Friends of Mineralogy - Midwest Chapter meeting
6:30 pm	Pot luck dinner at the home of Pete and Prue Richards

Sunday, November 9, 2014

9:30 am	Early-bird mounters and Workshop Continuation
12 pm	Lunch
1 pm	Museum gallery tour or Workshop Session

Registration

Three-day Fee: $40 per person or $75 per couple
Single-day Fees: $10 Friday, $25 Saturday, $10 Sunday
Student Fee: $5 per day

Lunches will be available for purchase at the Museum's Blue Planet Café

Make checks payable to "Cleveland Museum of Natural History" with memo "Micromineral Symposium" and submit your name, mailing address, email address, days attended and payment to:

The Cleveland Museum of Natural History
1 Wade Oval Drive, University Circle
Cleveland, Ohio 44106
Attn: Lauren Kelly

Construction Advisory

Ongoing construction of Martin Luther King, Jr. Drive may cause delays. Information about the latest traffic pattern changes and road closures may be found on the University Circle Inc. website.

From the East or West

Interstate 90 and Route 2 (Shoreway); exit the Shoreway at Martin Luther King, Jr. Drive (MLK). Travel south on MLK to the second stoplight at East 105th Street (approximately two miles). At this intersection you are facing the back of the Museum. Go halfway around the traffic circle and proceed straight up the hill onto East Boulevard. Turn right at the first stoplight. Our parking lot is located near the corner of East Boulevard and Wade Oval Drive.

From the South

North on Interstate 71 or 77 to Interstate 90 East (Shoreway). Exit at Martin Luther King, Jr. Drive and proceed as East/West directions indicate.

From the Southwest

Interstate 480 East, to Interstate 77 North, to Interstate 90 East (Shoreway). Exit at Martin Luther King, Jr. Drive and proceed as East/West directions indicate.

From the Southeast

Interstate 271 North to Interstate 90 West (Shoreway). Exit at Martin Luther King, Jr. Drive and proceed as East/West directions indicate.

From the Near Eastern Suburbs

Take Mayfield Road west down Mayfield Hill (Little Italy) to Euclid Avenue. Cross Euclid Avenue. Mayfield turns into Ford Road here. Merge right from Ford Road onto East Boulevard. Turn left at the first traffic light onto Wade Oval Drive. The Museum parking lot is on the right.

FRIENDS OF MINERALOGY, INC.
Midwest Chapter

APPLICATION FOR MEMBERSHIP
MEMBER DATA SHEET

Please fill in this application and mail it along with your check to the address listed at the bottom.

Name _____
Last First Middle Initial

Address _____
Street City or Town

_____
State Zip/Postal Code

Telephone Number _____ (Home) _____ (Office/cell)

E-mail address _____

Would you be willing to serve as an officer or committee member/chair? _____

I affirm that I support the purposes* of Friends of Mineralogy:

Signature _____ **Date** _____

Friends of Mineralogy, Inc. is composed of the members of 7 local chapters, plus national members not affiliated with a chapter. **Prospective Midwest Chapter members should send this completed application and $20.00/year dues to:**

Jeff Spencer, Treasurer
Friends of Mineralogy, Midwest Chapter
4948 Beachwood Dr., Cincinnati, Ohio 45244

*1. To promote interest in and knowledge of mineralogy.
2. To advance mineralogical education.
3. To protect and preserve mineral specimens and promote conservation of mineral localities.
4. To further cooperation between amateur and professional and encourage collection of minerals for educational value.
5. To support publications about mineralogy and about the programs of kindred organizations.