

Friends of Mineralogy



***Midwest Chapter Newsletter for
January – February 2017***

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Reminder! Your 2017 membership registration needs to be completed. Please see the Treasurer's report on page 5 for more details.



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.

Chapter Website:

www.fommidwest.org

National Website:

www.friendsofmineralogy.org

On the Cover –

Fluorite / Etched Calcite

Caldwell Stone

Danville, Kentucky

Approximately 2.0" in length

Randy Marsh photo

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THE MINERALOGICAL SOCIETY OF AMERICA
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MINDAT

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.



President's Message

New Year's Greetings Friends,

We had our annual election in early-November.

I'm pleased to announce that Kenneth Bladh was elected to replace me as president. I will be

putting in some additional time in the penalty box as the new Liaison Officer. I have a year left as a director with National, so it seemed like a natural thing to do to help keep the chapter informed of what is happening. Also, I can more effectively assist Ken with the transition into the intricacies of the presidency. The vice-presidents, treasurer, and secretary have agreed to continue to serve and were re-elected as part of the slate of officers put to the membership in attendance; the newsletter editor, who is appointed by the president, is willing to continue on, also. Please see the minutes below for more detail.

David Saja, Mineralogy Curator at the Cleveland Museum of Natural History, confirmed a rumor that I had heard. He will not be able to host future FM meetings at the museum because the classrooms where we and the micromounting society have been meeting are going to be demolished as part of a renovation program. Also, apparently, the mineral display upstairs at the museum is scheduled to be removed. So, if you haven't seen it, I encourage you to visit before it is gone. We will need to find a new meeting place for our annual business meeting. It will probably be at Wittenberg University (Springfield, OH), which is more centrally located.

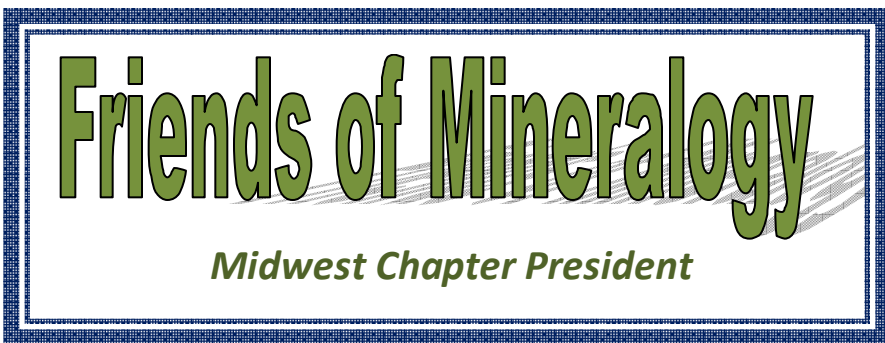
Randy Marsh is moving forward with plans for the 2017 symposium in March, to be held again at Miami University. The theme will be "Sphalerite and Wurtzite – Zinc Sulfide Polymorphs." The Executive Board recommended the expenditure of up to \$1,000 to support the symposium, and the membership voted to approve the recommendation during the business meeting.

It is almost the end of the year and many members have not yet sent in their dues. Please do so soon as a courtesy to the treasurer, who will find it a more efficient use of his time to deal with the paperwork in bulk rather than singly if they trickle in.

Lastly, I want to remark that I think that the chapter has accomplished a great deal in the last four years. The membership has grown, the treasury is considerably expanded, we now have a professional website that we are in direct control of, and all officer positions are filled with dedicated volunteers. (We could still use a volunteer for the Fundraising Chairman position.) We will sponsor our fifth consecutive annual mineralogy symposium in 2017. We are now holding our own Hazard and Safety Training, with blessings from MSHA, which is tailored to collectors instead of miners. These results are because you are fortunate to have a team of dedicated professionals. That team is basically still in place, with the addition of an experienced mineralogy professor and university provost at the helm. I'm looking forward to even more advances in the near future. The only problem we seem to be presented with is that, because of MSHA squeezing quarry operators, and their concerns over litigation, we have lost all of our former quarry collecting sites in Indiana, and some in Ohio. We have been prospecting for replacement and new sites, but so far, none of them are of the quality of Auglaize or Clay Center.

Please see the introduction below from your president elect.

Clyde Spencer



Welcome to our new chapter President - Ken Bladh!

Greetings! I am a soon-to-be-retired Professor of Geology at Wittenberg University, Springfield, Ohio. I hold advanced degrees in Geoscience from the University of Arizona (Tucson) and while there, as a hobby and relief from graduate study, learned the joys of collecting micromounts from Dr. Art Roe (a member of the Micromounter Hall of Fame). With John Anthony, Richard Bideaux, and Monte Nichols, I coauthored the 5 volume Handbook of Mineralogy (1990 through 2003), and now serve as Editor of the *Mineralogical Society of America* online version of the Handbook. Over the past four decades, I have presented illustrated talks on mineralogical topics to regional clubs, judged competitive exhibits at regional mineral shows and brought guest exhibits from Wittenberg's collections.

My experience with field collecting began as a college undergraduate in the Midwest and continued through my decade of graduate study in Arizona (too many mine dumps and not enough time). While teaching at Wittenberg, I led trips with students to quarries and active mines in the UP of Michigan, Indiana, Illinois, Missouri, Ohio, Virginia, and North Carolina. Ongoing interactions with local amateur field collectors and knowledgeable enthusiasts at regional mineral shows sustained me through those times when professional commitments like writing the Handbook left little time for field collecting.

My awareness of the mission and goals of *Friends of Mineralogy* began at its origins in the 1970's while I was a student at the University of Arizona through contact with the founders of *The Mineralogical Record* and by attending the excellent FM Symposium each year at the Tucson Gem & Mineral Show. Roaming the corridors of motels, handing flat after flat of minerals from all over the world, and interacting with prominent mineralogists who came to Tucson each February for the show became an important influence on my career path and ongoing mineralogical interests. Most of my personal collection is thumbnail single crystals and micromounts. I also enjoy the unique challenges of photo-microscopy of these minute, but perfect, micro-crystals.

It's a genuine honor for me to serve as President of this chapter of Friends of Mineralogy and help us attain our shared goals for the advancement of mineralogy. I look forward to meeting as many of you as I can over the coming year.

Ken Bladh

Our next chapter meeting will be on March 11th at Miami University. The meeting time is at 10:00 and is in association with our 5th Annual FM Midwest Chapter Symposium

Treasurer's Report

12/15/16

As of the last report in October, our treasury balance stood at \$4,565.89. Since that time 33 members have paid their 2017 dues bringing in \$660.00. At the suggestion of Randy Marsh, we have added an easy way to make an additional donation while paying your dues. The new form allows you to add an additional amount which you may designate to go to underwrite the Annual Symposium or to the General Treasury (You may contribute to both). So far, we have received \$150.00 for the symposium fund and \$40.00 for the general treasury. We made a \$38.00 payment for National dues: \$30.00 was outstanding from 2013 and \$8.00 for 2016. This brings the total general treasury to \$5,227.89 and the symposium fund to \$150.00.

At the last meeting in Cleveland, we voted to establish a budget of \$1000.00 for the Annual Symposium in March. Randy Marsh has also arranged to conduct a silent auction as part of the symposium event. That gives you an additional way to provide support. Donate a specimen, bid on a specimen, or both! Please contact Randy if you have a specimen to donate.

2017 Dues

2017 Dues are still \$20.00 per person. Please complete and sign the Registration form and include it with your check. Existing members may indicate 'no change' if all the information remains the same. The new form is available on our website at:

<http://www.fommidwest.org/library/registration-forms/>

Remember: registrations are due no later than March 1st, so don't put it off! Please contact me at treasurer@fommidwest.org if you have any questions or concerns.

Jeff Spencer – Treasurer



A pale blue fluorite collected by Randy Marsh earlier this year from Walworth, New York

Friends of Mineralogy, Midwest Chapter
Meeting Minutes- November 5, 2016
Cleveland Museum of Natural History
Cleveland, Ohio

Called to order by President Clyde Spencer at 3:30 PM. The following officers were present: Clyde Spencer, President; Randy Marsh, Vice President Programs; Jeff Spencer, Treasurer; Frank Konieczki, Secretary. Seventeen members and guests were present.

No formal agenda was presented for review/discussion.

Old Business:

President Spencer asked if any corrections to the April 30, 2016 meeting minutes were necessary. No changes were proposed or adopted.

New Business:

President Spencer began the meeting by noting that this will be the last Micromineral Symposium held at this location. The classrooms on the lower level will be demolished next year as part of museum renovations, so a new site will have to be sought for the last meeting of the year.

Treasurer's Report: Treasurer Jeff Spencer reported that he did projections for 2017, and even if expenses for next year increase, there will be positive net revenue. Membership has increased from 82 members in 2013 to 115 members in 2016, which has resulted in increased revenue, and a reduction in annual dues to National has lessened the burden on Midwest Chapter resources. Jeff showed a graph that illustrated net financial gains from the last three years. The 2014 year-end balance increased by \$500 over 2013. Similarly, 2015 showed a net gain of \$1,700, and the current year's ending balance will show an increase of approximately \$1,300.

The chapter's registration form has been changed to allow for donations to 1) the annual symposium, and 2) the general fund.

President Spencer indicated that this would be his last meeting as the Midwest Chapter President, and that the current meeting's primary agenda item was to be the election of a slate of officers for 2017. President Spencer advised that all present officers, save President, have agreed to continue in their current capacities. He indicated that Ken Bladh, (Wittenberg University Professor) would accept the position of President, if elected. Dr. Bladh is planning to retire in August, 2017. The floor was opened for nominations, and those received were as follows: Ken Bladh, President; Randy Marsh, Vice President Programs; Reggie Rose, Vice President Field Trips; Jeff Spencer, Treasurer; Frank Konieczki, Secretary; and Clyde Spencer, Liaison Officer. A motion was made to accept the aforementioned slate of officers, and the motion was carried by unanimous acclamation (RMarsh/SFox/P). President Spencer noted that Newsletter Editor Tom Bolka has graciously agreed to continue in his current capacity for the coming year.

President Spencer indicated that the Midwest Chapter has received two donations, one from the recent Agate Expo, and a \$200 donation from Ken Bladh's wife, that were originally in the National coffers, but have since been transferred to the Midwest Chapter. He indicated we cannot always count on such windfalls. There was discussion about the possibility of funding a small scholarship for student scholars in earth sciences. David Saja stated that the Pennsylvania Chapter tried to provide a \$500 scholarship, but they did not receive any applications. Ed O'Dell indicated that another possibility would be to fund a scholarship to Wild Acres (lapidary), and that might be better received. There was also discussion of supporting other symposia, but as President Spencer noted, working with National to support other such



events has been difficult. Discussions regarding symposia funding led to the resignation of National President Schauss and the Committee Chair. There have been two requests regarding symposia received by National, namely New Mexico and Tellus. Perhaps we could work with other chapters to fund such activities.

Vice President Programs Randy Marsh indicated that the subject of the next symposium, which will be held on March 11, 2017 at Miami University, will be zinc sulfide polymorphs. A motion to use up to \$1,000 from the general fund to defray expenses for the symposium was made, and passed without opposition (RMarsh/MRoyal/P). He stated the Chapter will have a table at GeoFair next year, and donations for the sales will be welcome. David Saja volunteered some lapidary material.

Randy Marsh reminded those present that Ed O'Dell has arranged a field trip to Caldwell Stone in Danville, KY on 11/19/16, and that requests to attend should be directed to Ed via e-mail.

President Spencer reminded attendees that there had been a request from National for Midwest minerals to display at Tucson, and a request had been sent to Midwest Chapter members, but no responses were received. Randy Marsh is coordinating the display case on behalf of the Midwest Chapter. If you have one or two good specimens that you have collected, please consider allowing your specimens to be displayed. He and Randy will be driving to Tucson together, and if you are willing to entrust your specimens to them, please contact Randy to make arrangements. You may also choose to ship your specimens to Tucson.

Treasurer Jeff Spencer provided an overview of a scouting trip to Hanson Aggregates in Castalia, Ohio two weeks ago. The venture did not yield many mineral specimens. Tom Bolka found a vug containing fluorite, but little else was found. Jeff felt that if the quarry operators excavate the next level, arranging a trip there might prove fruitful. Otherwise, this quarry is not recommended for collecting. A trip to Lima, Ohio was also made later that day, because there were nice calcite specimens found at the sump level in nearby Buckland four years ago. This trip was made because the quarry operation has reached the same level at Lima; however, nothing substantial was found. This quarry may be expanded in the coming years, and if so, perhaps collectible minerals will be more evident.

President Spencer indicated that there is currently no access to Indiana quarries for field trips. He thought there was a possibility of getting into the Harding Street Quarry in Indianapolis, but it does not appear that the quarry administration will currently allow access. The only site outside of Ohio where FoM Midwest has been able to regularly arrange field trips is in South Rockwood, MI.

President Spencer stated there is increased scrutiny of quarry operations by MSHA. He cited a recent example in Custer, SD. A sole owner/operator of a rose quartz quarry was recently told by MSHA that he must complete Part 48 training because the quarry has an overhang from excavating, so the quarry is now considered to be an underground mine. He indicated he believes the requirement is likely illegal. President Spencer also said there are increased demands pertaining to reclamation requirements and fees in Colorado. These pressures on operators may result in further diminishment of collecting opportunities.

Sharon Fox thanked President Spencer for his service as Chapter President, to applause.

Meeting adjourned: 4:22 PM (ACook/JSpencer/P)

Program: The meeting was held in conjunction with the last annual Micromineral Symposium. Several FoM Midwest members attended the symposium prior to the meeting.

Respectfully submitted by Frank Konieczki, Secretary

FM on the go.....

Field Trip Reports

Caldwell Stone Trip Report

In late November, about 15 Chapter members braved the cold and headed to the Caldwell Stone Quarry located near Danville, KY. The trip was made possible through the kind efforts of Ed Odell and Danny Settles. This quarry produces concrete and construction aggregate, aglime and crushed stone. It is located in the central Kentucky fluorspar district and contains middle Ordovician Lexington limestone. A low temperature, hydrothermal vein (known as the Walker vein) runs through this quarry and, in years gone past, has produced superb specimens of fluorite, sphalerite, and calcite, typically in association with white bladed barite. The quarry has also produced good specimens of strontianite, pyrite and smithsonite. Much of the Walker vein has been removed, and mineralization is fairly sparse except in areas where offshoots of the old vein are intersected.

When we entered the quarry, we initially started exploring in a middle layer. A few folks ventured into two lower regions. Overall, few specimens were being found. Several of us ventured up to a higher level, where mineralization was more prevalent in the rocks. While it is hard to believe, I had to direct veteran collector Mike Royal to where the fluorite was in this quarry (his fluorite detector was broken that day). This brings to mind the saying "It will be a cold day in Danville before you find more fluorite than Mike Royal." I extracted a few decent specimens of purple fluorite cubes out of a large bolder that appeared to have a streak of the Walker vein running across it. Mike Royal did find some small vugs with fluorite in the same area. Lots more vugs of good calcite crystals on this layer on well. Our group is welcome to return to this quarry next year, so long as we time our visit to fall between any visits from the Kentucky Blue Grass Gem and Mineral Society. This quarry is not so productive that it can support a lot of collectors at the same time.

After collecting in the Caldwell quarry, several of us also went over to the Mt. Sterling area and stopped at a road cut I am familiar with. There are drainage ditches lined with Flemingsburg quarry rip rap. The rocks are shot through with rabbit holes of calcite associated with stromatolites. For those of us who spent some time working with the limestone, we were well rewarded. Frank Konieczki, John Lindsay and I found some very nice specimens of water-clear rhombohedral and brown dogtooth calcite.

Randy Marsh



Calcite, Mount Sterling Kentucky – Frank Konieczki



Clear Calcite, Mount Sterling Kentucky – Randy Marsh

Barite-Bearing Concretions Near the
Book Cliffs Area of Grand Junction, Mesa County, Colorado:
Genesis, Mineralogy and Collecting

Daniel Kile



Mount Garfield and the Book Cliffs, north of Grand Junction. Photograph by Dan Kile.

Introduction and locality

The Book Cliffs area north of Grand Junction in Mesa County, Colorado, is renowned for its prismatic water-clear barite crystals with mirror-bright faces. My wife, Dianne, and I had our first introduction to concretions at this locality in the spring of 1973, following the exhibition of Grand Junction barite at the Denver Mineral Show (which at that time was held at the Adams County Fairgrounds). At the show, we had networked with a local collector, who offered to take us to the Book Cliffs locality. After several trips with modest success, we finally found a few very nice crystals in a remote area. Even at this time, collecting was becoming challenging, as many of the concretion-bearing areas had already been explored by local mineral collectors as well as students from Mesa State College (now known as Colorado Mesa University) students, who use this as a study area for their geology curriculum. Local collectors had in fact known about and collected in this area since the 1940s (Look 1947), but it gained widespread attention following publication of an article on the locality in *The Mineralogical Record* in 1976 (Cajori 1976).

At first glance, the area looks like a desert wasteland, an appearance that likely encourages abuse of the landscape by the innumerable present-day ATVs and dirt bikes. On closer examination, however, this region features cactus and

abundant spring wildflowers. This is nonetheless a semi-arid climate, with survival a matter of thorns or fangs for defense. Indian paintbrush and globe mallow, as well as devil's claw and claret-cup cactus, are abundant, among other distinctive plant species. Lizards, including the spectacular collared lizard, and horned toads, comprise some of the surface-dwelling critters; below ground, and notably, within the concretions, are scorpions, centipedes, snakes (bull snakes and king snakes), black widow spiders, and the occasional vole.

Average temperatures in the summer can range above 90° F. in town, and without shade at the Book Cliffs can be even higher, well above 100° F. Annual rainfall is sparse, but summer thunderstorms can render travel virtually impossible on the water-slickened shale roads and trails. I am aware of at least one instance of a traveler stranded for 2-3 days following a storm, and indeed, I can personally attest to the tenacious and slippery clay when it is wet. Due caution is given to interlopers to this environment!

Geology, Concretion Form and Genesis

Concretions occur in the upper third of the Mancos Shale, underlying the Mesaverde Formation that caps the Book Cliffs; the fluted nature of the weathered shale gives the "book" appearance to the cliffs. In Colorado, the Mancos Shale is approximately 5,000 feet thick; it also crops out south of Grand Junction (in a lower horizon of the Mancos) into Ouray County, as well as localities west of Grand Junction, extending into Emery County in Utah. Although concretions are found throughout the Mancos Formation, those containing barite are mostly restricted to areas north of Grand Junction; concretions south of Grand Junction along Highway 50 sometimes yield calcite, but little or no barite.

The concretions occur as discrete, approximately spherical to elliptical nodules, sometimes overlying a thick limestone ledge, and often as irregular aggregates of 2-6 nodules within the same irregular structural composite. Concretions may be arranged in an interconnected linear fashion, or discrete concretions may be layered one on top of the other. Individual concretions range from ½-inch in diameter to more than 6 feet in diameter, with intergrown concretion aggregates occurring as much as much as 15 feet across.

It is generally accepted that sedimentary concretions form by accretion of carbonates in shale; the precise mechanism of nucleation and accretion is not settled, with the simplest mechanism being that concretions formed by nucleation of carbonates around a fossil, followed by accretion of sedimentary carbonate (calcareous or dolomitic) into a generally spheroidal structure (with consequent deformation of the surrounding shale layers). Others, however, have invoked early formation based on the development of bacterial extracellular polysaccharides in an organic carbon-rich sediment, with degradation of polysaccharide and concomitant precipitation of carbonate, and shrinkage of the protoconcretion due to syneresis of smectite clays (Hendry and others 2006).

Most concretions are devoid of significant mineralization, but in perhaps from 5 – 50% of the nodules in a given area may contain voids that host collectible minerals, most notably barite; typically these voids are associated with a concentric internal structure, presumably created by shrinkage during lithification. Typically present in the center are also irregular shards of matrix, which may host barite crystals. Such structure warrants further exploration. Often, however, voids within concretions are completely filled with calcite (sometimes enclosing barite) that cements the entire interior into an intractable mass.



Interior of a concretion showing a concentric structure and internal voids surrounding irregular fragments; in this nodule, specimen-grade barite occurred within these open spaces

Collecting

The principal collecting area ranges from approximately 24 Road on the NW, to 29 Road on the SE, with the road number being reflective of the miles to the Utah state border.

This area has been heavily collected for the past 70+ years; indeed, almost every visible concretion has to some extent been opened, leading to a common refrain from collectors that the "area has been dug out". Despite the massive amount of collecting, we have been consistently able to find new nodules to dig, and even a few exceptional specimens from time to time, over the past 5-10 years. Given the composite nature of many concretion aggregates, or the proximity of multiple discrete but adjoining nodules, exploration around the periphery is warranted. Also, many collectors stop when they encounter a solid ledge of limestone; sometimes digging beyond that will lead to another open nodular structure. The key is a careful examination of the dumps of previously dug concretions; the presence of irregular fragments or shards, in conjunction with Fe-dolomite, is indicative of potential mineralization that may continue within if an area has been outlined for further exploration. Some collectors have surmised that the presence of an irregular ('rope' texture) on the external surfaces of concretions indicates the presence of barite within, but this appears to be a tenuous correlation, as exceptional crystals have also been noted in concretions lacking this external texture.

Tools required include a sturdy 3-foot crowbar (preferably with the nail puller end straightened to a 90-degree angle), a smaller such tool (ca. 18 inches) of the same construction, a 3-4 pound sledge hammer, bent screwdriver, rock pick and a large pick, various cold chisels ranging in size from 12 to 20 inches, and given the range of fanged critters that make their homes inside of concretions, *gloves*. A flashlight is also useful, as some concretions have facilitated tunneling

considerable distances through the loose interior shards into dark recesses. A sharpened tile probe, available from forestry supply catalogs, is helpful for searching for buried concretions or delineating margins of a concretion that has already been dug. It is important to not dig a concretion from the top down, as surely any specimen-grade minerals will be damaged by falling debris or wedging matrix shards against one another. Rather, one should dig the periphery of the concretion at least 2/3 of the way around the circumference, deep enough to identify a point at which the concretion curls inward, or at least attains a vertical exterior surface.

Mineralogy

Certainly, barite is among the most noteworthy of specimens found here, especially on those on a pleasing matrix of contrasting brown microcrystalline Fe-dolomite. The section below describes the minerals from this locality, both well known among collectors, and some not widely recognized.

Barite

Occurs as prismatic crystals to 6 inches in length (Cajori 1976), but are typically less than 2 inches; the best are "lustrous and water clear", but most have some veils (often horizontally banded) or kaolinite inclusions of varying degrees. Single crystals are most commonly found; specimen-grade matrix specimens are much less often collected. Three-dimensional matrix groups of barite are the rarest of specimens from this locality.



Barite crystals on Fe-dolomite coated matrix, 4-3/4 inches wide

Calcite

Calcite occurs as simple flattened rhombohedrons of a "nailhead" habit. Individual crystals approximately 6 inches across have been observed (Eckel et al. 1997), but most are on the order of 2 inches or less in size. Despite the near ubiquitousness of this mineral within the concretions, good crystals seem even scarcer than barite; only rarely are the two minerals found intimately associated.



Calcite on Fe-dolomite coated matrix, 4 inches wide

Dolomite, $\text{CaMg}(\text{CO}_3)_2$.

Iron-bearing (ferroan) dolomite microcrystals line the interlocking shards and concentric fragments that occur in voids within the concretions (Eckel et al. 1997). Crystal size varies from submicroscopic to individual crystals to ca. 1.5 mm wide. It is one of the first minerals to crystallize on interior surfaces in the concretions. The color ranges from an earthy, weathered orange-brown, to a lustrous dark brown. The dolomite is mostly noteworthy in that it provides the pleasing light brown matrix that hosts many of the better barite crystals.

Gypsum, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$.

Gypsum (var. selenite) was noted in Eckel et al. (1997), but not otherwise described. Because of its relatively high water solubility (compared to barite, for example), it is often found showing the effects of weathering. It is usually noted in the Book Cliffs area as subhedral crystals filling fractures within the foliated Mancos Shale, where it weathers out of steep hillsides, although in one such outcrop it occurred in a vein as rosettes of sharp, bladed crystals in a fracture zone in the shale, in aggregates to 1 inch high x 5 inches across. It is rarely seen within concretions, but has been noted as a euhedral crystal that was 10 inches in length (P. Blankenheim pers. comm. 2015); most crystals formed within

concretions are much smaller and with rough surfaces. Gypsum is often noted as a lustrous thin film coating limestone shards, evidenced by a surficial sheen. However, in one nodule, lustrous radiating sprays of gypsum were noted as a thick (ca. 1–2 mm), crystallized layer coating the surfaces of matrix shards within the interior; the individual radial groups were as much as 2 inches across.

Hexahydrite, $\text{MgSO}_4 \cdot 6\text{H}_2\text{O}$.

Hexahydrite has not been previously reported as occurring in Book Cliffs concretions. It is a white evaporite precipitate that typically occurs as a surficial efflorescence that forms in dry periods; it is highly water soluble and hence uncommon mineral in most environments. The Book Cliffs area north of Grand Junction has a semi-arid climate, receiving an average of 9.4 inches rainfall per year (Current Results 2015); such climate is conducive to formation of water-soluble minerals in protected areas. Hexahydrite was noted (by Dianne) as a vein filling in a concretion and initially identified based on optical properties (biaxial negative, $n_{\omega} \sim 1.45$, $2V \sim 40^\circ$) and subsequently confirmed both by optics and X-Ray diffraction.

Kaolinite, $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$.

Kaolinite is a late-formed mineral in the Book Cliffs concretions, where it occurs as a white powder coating upper interior surfaces, or as layered inclusions within barite crystals. This powder consists of microscopic pseudohexagonal plates ranging in size from 3–16 μm . Collectors, having anecdotally attributed it as being microcrystalline barite, formerly overlooked it. Optical examination in 1999 however showed a pseudo-hexagonal plates with a refractive index matching kaolinite (e.g., $n_{\omega} = 1.567 \pm 0.002$); X-Ray diffraction subsequently confirmed this species (Kile 2008).

Collectors have long correlated the presence of kaolinite with specimen-grade barite crystals and considered its presence to warrant extra caution in excavating a nodule. There may be some logic to this speculation, as the hydrodynamic conditions of groundwater flow supporting extensive aluminosilicate transport would also lead to crystallization of barite. However, the correlation may not be perfect: Not all barite-bearing concretions host kaolinite, and not all kaolinite-bearing concretions have substantial barite crystallization (i.e., kaolinite has been found in open concretions without barite). Interestingly, the author knows of no other concretion locality in Colorado where kaolinite is abundant, despite the presence of barite. Of note is that an abundance of kaolinite can result in its inclusion within and on the surface of barite crystals, significantly degrading its specimen appeal.

The presence of large quantities of kaolinite in concretions poses formidable theoretical difficulties regarding internal crystallization processes: Aluminum and aluminum silicates, e.g., kaolinite, are exceedingly insoluble in water, and an immense volume of groundwater flow would be required, through a relatively impermeable shale, to transport the quantity of aluminosilicate necessary to account for the amounts that can be found within some of the nodules. For example, approximately 135 grams was recovered from one large concretion (with a much greater quantity than that having been blown away by a strong wind during the collecting process!). With a water solubility on the order of 0.1–1 mg/L (Drever 1988), a volume of 1.4×10^8 liters (ca. 25 million gallons!) would be required to transport that quantity of kaolinite, which would require an improbably high flow rate through a relatively impermeable shale.

Quartz, SiO_2 .

Quartz occurs as lustrous micro-crystals comprising small rosettes of colorless, transparent crystals to approximately 3 mm in diameter; it was noted previously but not otherwise described by Kile, Modreski, and Kile (1991). The crystals are predominantly composed of positive and negative rhombohedral faces, with little prism development. It is one of the earliest minerals formed in the Book Cliffs concretions, preceding ferroan dolomite. It is uncommon at this locality, and small rosettes are often overlooked amidst the Fe-dolomite.

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Previously published in the Colorado FM chapter's newsletter.

Quarry Travel / Event Guide

FRIENDS OF MINERALOGY MIDWEST CHAPTER		
JAN-APR 2017 CALENDAR OF EVENTS		
Month	Event Details	Additional Info
FEBRUARY	TITLE: Annual Friends of Mineralogy General Membership Meeting DATE/TIME: Tuesday, Feb 7, 2017 4:00-6:00 PM LOCATION: Location TBD ACTIVITIES: Summary of Chapter activities	FM National Meeting

	TITLE: Tucson Gem and Mineral Show – Mineral Treasures of the Midwest DATE/TIME: Thursday, Feb 9, 2017 10:00 AM to Sunday, Feb 12, 2017 5:00 PM LOCATION: Convention Center, 260 South Church Avenue, Tucson, AZ ACTIVITIES: Chapter display case	Chapter hosting display case on Midwest Minerals self-collected by Chapter members
	TITLE: 15 th Annual GeoFest - The Indiana State Museum Gem, Fossil and Mineral Show DATE/TIME: Saturday, Feb 18, 2017 10:00 AM – 5:00 PM LOCATION: Indiana State Museum, Indianapolis, IN HOST/COORDINATOR: Peggy Fisherkeller (pfisherkeller@indianamuseum.org) ACTIVITY: Booth with Midwest minerals provided by John Davis and Randy Marsh	
MARCH	TITLE: Eastern Indiana Gem & Geological Society Annual Gem, Mineral and Fossil Show DATE/TIME: Fri & Sat, Mar 3-4, 2017 10:00 AM – 6:00 PM, Sun, Mar 5, 2017 11:00 AM – 4:00 PM LOCATION: Wayne County Fairgrounds, 861 Salisbury Road, Richmond, IN HOST/COORDINATOR: Joe Wirrig (sunow@frontier.com)	
	TITLE: 5 th Annual FM Midwest Chapter Symposium – Sphalerite & Wurtzite: The ZnS Polymorphs DATE/TIME: Saturday, Mar 11, 2017 10:00 AM – 4:30 PM LOCATION: 152 Shideler Hall, Miami University, Oxford, OH HOST/COORDINATOR: John Rakovan (rakovajf@miamioh.edu) ACTIVITY: Chapter meeting, symposium, silent auction	March Chapter Meeting Require Donations for Silent Auction
	TITLE: 19 th Annual Spring Indianapolis Bead, Gem, Mineral & Jewelry Show DATE/TIME: Friday, Mar 31, 2017 to Sunday, Apr 2, 2017 LOCATION: Indiana State Fairgrounds, 1202 East 38 th Street, Indianapolis, IN HOST/COORDINATOR: Van Wimmer (van@toteshow.com)	
APRIL	TITLE: 43 rd Annual Central Ohio Mineral, Fossil and Gem Show DATE/TIME: Saturday, Apr 8, 2017 and Sunday, Apr 9, 2017 10:00 AM – 6:00 PM LOCATION: Northland Performing Arts Center, 4411 Tamarack Blvd, Columbus, OH SPONSORED BY: Columbus Rock and Mineral Society	
	TITLE: 44 th Rochester Mineralogical Symposium DATE/TIME: Thursday, Apr 20, 2017 to Sunday, Apr 23, 2017 LOCATION: Radisson Hotel Rochester Airport at 175 Jefferson Road, Rochester, NY	



	<p>TITLE: GeoFair 2017 – Quartz: Crystals & Gems</p> <p>DATE/TIME: Sat, May 6, 2017 10:00 AM - 6:00 PM and Sun, May 7, 2017 11:00 AM – 5:00 PM</p> <p>LOCATION: Sharonville Convention Center, 11355 Chester Road, Cincinnati, OH</p> <p>HOST/COORDINATOR: Terry Huizing (tehuizing@fuse.net)</p> <p>ACTIVITY: Chapter meeting scheduled for 4:30 PM on Saturday May 6, 2017</p>	<p>April</p> <p>Chapter Meeting</p>
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Friends of Mineralogy Midwest Chapter
5th Annual Mineralogical Symposium
SPHALERITE AND WURTZITE: THE ZNS POLYMORPHS
(Hosted By the Karl E. Limper Geology Museum)

DATE: Saturday March 11, 2017

TIME: 10:00 AM – 4:30 PM

LOCATION: 152 Shideler Hall (Spring Street & Patterson Ave), Miami University, Oxford, OH

CONTACTS: John Rakovan, Professor of Mineralogy, Miami University (rakovajf@miamioh.edu or 513-529-3245) and Randy Marsh, Vice President Programs, Friends of Mineralogy Midwest Chapter (vpprograms@fommidwest.org or 513-515-7890)

LEX GEM SHOW



MARCH 25 & 26, 2017

Mineral and fossil specimens, cabbing rough, crystals,

Artisan jewelry, books, and children's items.

Silent Auctions and Hourly Door Prizes

Free Parking

New This Year! Educational Seminar



Mike Howard, author of "Rockhounding Arkansas" will give 1 free seminar each day on the geology of Arkansas and the minerals and crystals found in Arkansas. He was an economic geologist/mineralogist for 40 years, retired in 2013. He has authored many articles for mineral collectors as well as the scientific

community. Seating is limited at the seminar. Attendance is on a first come basis.

Show Hours:

Saturday

9 AM to 6 PM

Sunday

11 AM to 5 PM

Seminar Daily

11 AM

Clarion Hotel Convention Center

1950 Newtown Pike ~ Lexington, KY ~ Exit 115 I-75

ADMISSION: \$2 Adults ~ \$1 children 6-17; Scouts in uniform free; Families \$5

CONCESSIONS ON SITE

<http://bggamc.homestead.com/>



Cincinnati GeoFair 2017

52nd Annual

**Gem, Mineral, Fossil & Jewelry
Show of Greater Cincinnati**
www.geofair.com

May 6

Saturday
10 am to 6 pm

May 7

Sunday
11 am to 5 pm



Featuring:

Quartz – Crystals & Gems
Invertebrate Fossils

Illustrated Earth Science Programs
Saturday, May 6

Quartz: Signature Mineral of Continents
Digging for Dinosaurs

Sunday, May 7

Quartz: A Multifaceted Mineral
Major Transitions in the History of Life

**Sharonville
Convention Center**
11355 Chester Road
Sharonville, Ohio 45246
www.geofair.com for directions

FREE PARKING

Cincinnati GeoFair 2017

Adults.....\$9

Children....\$3

Two-day pass.....\$12

Uniformed Scouts free

Scout leaders pay adult rates

Teachers free with ID and paid adult companion

\$2 OFF ONE ADULT ADMISSION

GeoFair 2017

May 6 & May 7

Sharonville Convention Center
11355 Chester Road
Sharonville, Ohio 45246

FREE PARKING 2017.3

Gem, Mineral, Fossil, & Jewelry Dealers
50+ Retail • 4 Wholesale • 3 Publications
www.geofair.com for list

Educational Earth Science Programs
Dr. Carl Francis • Dr. Glenn Storrs
Mr. Jeff Scovil • Dr. Brenda Hunda

Gem, Mineral, Fossil & Jewelry Displays
70 museum, university, and private collections

Family Activities • Education Center • Games
Geode cracking • Demonstrations • Swap area
Free mineral, meteorite, fossil & gem
identification • Scout merit badge assistance
Free mineral or fossil collection - kids under 12

*GeoFair 2017 is produced by the nonprofit
Dry Dredgers – an organization of amateur
paleontologists & fossil collectors.
www.drydredgers.org, and the*

*Cincinnati Mineral Society – an organization
of amateur mineralogists & mineral collectors.
www.mineralsociety.org*

