

Friends of Mineralogy



**Midwest Chapter Newsletter for
November – December 2016**

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THE NEXT FM GENERAL MEETING (AND ELECTIONS) WILL BE ON NOVEMBER 5TH IN CONJUNCTION WITH THE MICRO – MINERAL SYMPOSIUM IN CLEVELAND. THE EVENT AND FM MEETING WILL BE AT THE MUSEUM OF NATURAL HISTORY. THE STARTING TIME IS 3:00PM.



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Chapter Website:

www.fommidwest.org

National Website:

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On the Cover –

Calcite / Sphalerite

Elmwood, Tennessee

5.0" x 3.0" x 3.0" Tom Bolka

photo

Affiliations:

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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

Dear Friends,

I attended the Denver Mineral show last month, primarily to host a meeting of FM members.

You should have received a copy of the National newsletter with the details. If not, let me know.

I have been threatening for a couple of years to step down as president of the chapter. It has been a privilege and a pleasure to serve as

president of the chapter for the last four years. However, the responsibilities of being both the Midwest Chapter president and National president has taken its toll. It seems that, especially this year, I have not had much time for personal things. I have been responsible for six President's Messages for the chapter and three for National.

Additionally, I have been coordinating with the newsletter editors and writing articles. Also, there are many 'behind the scenes' activities, especially for National, that has taken an inordinate amount of my time the last six months. I need to take some time to re-charge my batteries, as it were.

We will have our annual business meeting and elect officers on Saturday, November 5th, at 3:00 PM at The Cleveland Museum of Natural History. This is in conjunction with the museum's annual micromounting symposium. All but one of the current officers have agreed to continue to serve in their current positions (The one exception to that is me). They have done an exceptional job and I want to thank each of them personally for getting the chapter back on its feet. Fortunately, Dr. Kenneth Bladh of Wittenberg University (Springfield, OH) has graciously agreed to run for the position of president. While I'm recommending a slate of the existing officers plus Dr. Bladh, I will entertain nominations from the floor for any and all positions.

Four of our members (Randy Marsh, John Davis, Mike Royal, and John Lindsey) went to Walworth (NY) the weekend of October 8th & 9th.) Randy said the collecting was good with some pale-blue fluorites being his favorites.

An unresolved issue is that we have been locked out of collecting in Indiana for various reasons. I wish I knew what the answer to that was. Randy and I have been working on putting together a trip to Missouri for sometime this Winter. We were set to go this Summer, but my contact there, who has an old barite mine, said it was exceptionally wet this past Summer and, as a consequence, the vegetation and ticks were bad and he recommended that we re-schedule, which we did.

Incidentally, there will be a total solar eclipse next August, with the path of totality running from the North-West to the South-East US. The path will go through the Mississippi Valley mineral district in the early afternoon. A good place to watch it might be in western Kentucky. Perhaps we can coordinate a collecting trip to the general area the same day. If you haven't experienced a total solar eclipse, you shouldn't miss it!

I don't know how many of you knew professor Henry (aka Bumpi) Harwood (Troy Univ., LA). He died unexpectedly last month as a result of complications from the removal of a kidney stone. He coordinated a micromounting group in the southeastern US and was largely responsible for getting his group into a number of syenite quarries in the Little

Friends of Mineralogy

Midwest Chapter

From the office of the President

Clyde Spencer



Rock/Magnet Cove area. It remains to be seen whether anyone is willing or able to step up and continue to get us into those quarries.

Randy Marsh is coordinating the Tucson Gem and Mineral Show display case of Midwest minerals. We haven't had a resounding response to the call for specimens. It looks like the core of the display will be provided by Randy, Jeff Spencer, and me, with a few specimens from two or three others. We will be putting together a mock-up over Christmas vacation. It is not too late to volunteer to show off your best 'keeper.'

FM National received a couple of checks from the Agate Association Expo auction (See the Treasurer's Report). I suggested that since there were chapters established in the areas where the donors lived, that the monies should be given to the chapters. The Executive Committee agreed and we thus received some additional funds that would have otherwise gone to National.

If you are not familiar with the American Lands Access Association (ALAA), I strongly encourage you to read their most recent newsletter at http://amlands.org/media/DIR_24612/DIR_478067/8c590ced21e90b1ffff8267fffe904.pdf.

That is all for now. I look forward to seeing you in Cleveland for the business meeting.

Treasurer's Report

10/15/16

As of the last report in August, our treasury balance stood at \$4,200.89. Since that time, two new-member sign-ups added an additional \$40.00.

Our roster currently stands at 115 members. I have been in the process of reviewing our past financial records going back to 2008 and it looks like we underpaid our National dues by \$30.00. Once I double-check the numbers, I will pay that plus the additional \$8.00 for our two recent members

Our current treasury balance stands at \$4,565.89.

Agate Association Expo Auction Donation

The Agate Association Expo (Cedarburg, Wisconsin) last July held an auction where donors could designate one of several groups as the beneficiary of the sale. A couple of donors designated Friends of Mineralogy as the receiver of the proceeds from the sale of their donation. National has decided that the funds should be forwarded to the chapters that represent the donor's home state. One of the donor's lived in Wisconsin so we received a \$325.00 check from the sale of his specimen. Nice Agate! I have sent thank-you letters to the association and the donor.

2017 Dues

2017 Dues will remain unchanged at the current \$20.00. You may begin sending in your 2017 dues anytime. Registration forms are available on our website at:

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

Jeff Spencer – Treasurer



Hammered but happy!

The 27 FM collectors who went to Graymont Dolime quarry on September 14th thought they were in for a mineralogical treat, not a meteorological one.

The morning started out with the on-site safety presentation by host Gary Elliot. Gary gives the most thorough pre-field trip presentation of any quarry that we visit. While we are on the subject of Gary Elliot, he has to rank at the top as hosts go. Not only is his presentation thorough, but his company believes public education is important in the fields of geology and mineralogy.

Gary usually has a cooler with bottles of water on hot days for the collectors. There was no need for bottled water on this day. If you were thirsty, all you had to do was point your head skyward (if you have no fear of drowning). This trip was reminiscent of a 2008 trip to Lime City where at the end of the day we had 1.5" of rain in our buckets. That is where the similarity between Lime City 2008 and Genoa 2016 ended. At the end of this day, there was a whopping 2.75" of rain in one of my collecting cups. The quarry reported 2.8" of rain with some local residents recording 3 inches plus.

New FM member prospect Chiachen Wu did not seem to mind the "moist" conditions as she and Sharon Fox had a truckload of specimens. So if a "rookie" did not mind the rain, why should we, the grizzled veterans mind? After all, you can only get so wet. As usual, there was plenty of celestine to interest everyone, and calcite scalenohedrons were also present, but there were two specimens of note that I saw that are worth mentioning. Mike Royal found a fluorite close to one inch on a side, while Mike Scaglione extracted a dazzling tennis ball sized cluster of sphalerite crystals. The intensity of rain eliminated the possibility of pictures, but I will get them for a future issue. Mike and Mike's specimens are noteworthy and are of high enough quality to make a future FM newsletter cover. The FM collectors on this trip hammered on the rocks while the rain hammered on them. But they left as happy campers with their specimens.

Reggie Rose

***Sphalerite,
Calcite and
Celestine***

***Alan Dewitt
Genoa 2016***



***Calcite and
Celestine***

***Frank Konieczki
Genoa 2016***



Hammer on Hammer

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Clyde Spencer

At a recent MSHA safety training session conducted by Scott Kell, he showed the picture of me below as an example of someone well prepared. Afterwards, an individual in the class approached him and stated that a hammer to hammer blow was a violation of OSHA standards. He claimed that chisels are non-hardened steel and are designed purposely to mushroom rather than splinter. He claimed to have seen serious injuries caused by flying steel splinters from a hardened steel hammer striking a hardened steel wedge or hammer. Scott told him he was unaware of the claims, but would look into it. Scott told me that he has not found an applicable OSHA standard; however, a number of websites by

hammer manufacturers advise against the practice.



Incidentally, in the photo of me to the left, the rock had a large crack that went all the way through the boulder. I wasn't hitting my hammer as hard as I would a chisel because I was just trying to get the point in deep enough to use the curved point to pry the two pieces apart. Obviously, the design of the typical geologist's hammer is such that it is intended to be used to pry. Whether or not it can be hit hard on the face safely remains an open question unless we can learn more detail about how Estwing heat-treats their hammers.

I'm aware of the risk of hardened steel against hardened steel. That is part of the reason I wear eye protection, long-sleeve shirts, and gloves. Some of my chisels, but not all, are hardened throughout. Considering that geology hammers are intended for use on hard rocks, and observing the nature of the deformation on the heads, I had to question just how hard they are. What I observe when I dress them on a grinding wheel is that they are deforming, and not spalling or splintering. Besides, there are different degrees of hardening. I imagine that the lawyers for Estwing and other geology-hammer manufacturers have advised

them to use steel of a hardness that isn't highly prone to splintering.

The reason that some chisels are hardened is because the job they are required to do (such as cutting a bolt) couldn't be done with a soft chisel. One has to hit the hardened-steel chisel with a hammer to do the job! So, if such a claimed OSHA regulation exists, it was either created by a bureaucrat with no experience working on machinery, or, hopefully, recognizes that there are situations where one **has** to hit a hardened steel object with a hardened steel hammer. If there are indeed OSHA regulations about just what can be hit with a hammer, I would imagine that they would have to be specific, such as specifying the Rockwell hardness, or malleability difference between the hammer and object being hit.

If you discover that such a regulation exists, I would like to know about it and I will certainly be careful to observe it while in a commercial operation under OSHA control. However, in something like 60 years of pounding on rocks, the only hazards I have personally experienced are from quartz or chert spalling and cutting me. Hopefully, OSHA won't tell us we can't hammer on siliceous rocks!

I spent some time investigating OSHA hand tool standards. Following are some things that I think are pertinent to concerns about the danger of hitting one hammer with another:

1915.133(c)

Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

1915.133(d)

The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

1915.152(a)

Provision and use of equipment. The **employer** shall provide and shall ensure that each affected employee uses the appropriate personal protective equipment (PPE) for the eyes, face, head, extremities, torso, and respiratory system, including protective clothing, protective shields, protective barriers, personal fall protection equipment, and life saving equipment, meeting the applicable provisions of this subpart, wherever employees are exposed to work activity hazards that require the use of PPE.

1915.153(a)(1)

The **employer** shall ensure that each affected employee uses appropriate eye or face protection where there are exposures to eye or face hazards caused by flying particles, molten metal, liquid chemicals, acid or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

1915.155(a)(1)

The **employer** shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects.

I did a search for "hammers" and "chisels" on the OSHA site. I found a slide-show wherein one of the slides was "Hammer Rules." [Note that they are not Regulations.]

- Make sure the handle of the hammer fits tightly on the head.
- Do not strike a hard steel surface with the steel hammer.
- Do not use the hammer handle for striking and never use it as a pry bar.
- Always strike the surface squarely – NO glancing blows.
- Always wear safety goggles.
- Never strike any hammer with or against another hammer.
- Discard a hammer with a chipped or mushroomed face.
- **Do not use steel hammers on concrete, stone or hard metal objects.**
- Replace loose or cracked handles.
- Discard hammers with cracked claws or eye sections.

Note that the third from the bottom advises against what we routinely do in collecting! I will conclude (this was for shipyard workers) that they don't have experience with geologist's hammers. These rules are, again, probably most appropriate for machinist's and carpenter's hammers.

MythBusters: If two hammers strike each other, at least one of them will completely shatter with lethal force.

Busted

"Using a custom rig, the MythBusters repeatedly struck pairs of hammers together, but none shattered. Hammers with wooden handles merely snapped in two and hammers with metal handles bent. The MythBusters then decided to make the steel hammers harder and more brittle by adding more carbon, and through heat treatment. In particular, they attempted to case harden the hammers, however it is questionable if this was done correctly. They heated the hammers to high temperatures and then coated the hammer heads in used engine oil. They also decided to have the hammers strike a more sturdy anvil instead of each other. However, during testing, the carbonized hammers merely bent at the handles without shattering. Furthermore, an anvil is generally not made of particularly hard steel, and so that test may have been doomed from the beginning. An anvil with a hardened tool steel insert would have been more appropriate. Though the myth was busted, some hammers come with warnings not to use them to strike another tool or hardened nail with excessive force; although no hammerhead shattered or chipped, high-speed footage showed particle dust flying in all directions, which presents an eye hazard."

(This myth was revisited in [episode 75](#) and it was re-busted.)

There is a tendency for people to get Urban Legends embedded in their minds and never question the origin, or circumstances under which there might be an element of truth. One rarely, if ever, sees a carpenter's hammer with a mushroomed face. From my reading, it is apparent that things like claw-hammers have differential heat-treating to make the face of the hammer and the V-groove harder than the body in between. That is probably why there is concern about hitting a hammer on a hammer. The face is very hard to keep it from getting indented. Most people only have experience with the kinds of hammers that carpenter's or machinists use. Rules of Thumb can be useful, but one should know when they can be broken safely.

I know someone, a man I used to work with, who's daughter and neighbor girl were breaking geodes with a carpenter's hammer. A metal splinter flew off the hammer and lodged in the neighbor girl's eye! While I have not heard of, or observed such things happening with geologist's hammers, it points out the necessity of always wearing eye protection.

I'm concerned about getting this issue right, so I spent some more time looking for information on the internet. The other side of the argument is addressed pretty well here: <http://www.finewoodworking.com/item/17562/reader-says-mythbusters-missed-on-hammer-strikes> However, other than a lot of anecdotal stories about Murphy's Law in the comment section, I think that the best summary is the following:

"I am a retired metallurgical engineer with a lot of failure analysis experience. Those are my credentials for adding the following comment.

There are a lot of valid comments about chips flying off the faces of hammers (and other heat-treated tools) in this string of postings. The technical reason for this is that high impact can cause some of the steel in the tool to transform to "martensite", which is the hardest and most brittle form of steel. When you heat treat a tool to make it hard, you first quench it from an elevated temperature to transform all

(or most) of the steel to martensite. In that condition it is hard, but it is too brittle to be useful. The next step is to heat the tool to a moderately high temperature to transform the martensite into something called "tempered martensite." The higher the tempering temperature, the lower the hardness and the less brittle the steel. OK, that's the end of the lecture - but I'll be happy to answer questions about steel heat treatment from interested folks.

The key is that hitting a hammer can transform some of the head to brittle martensite, and that is where the danger lies. The next time you hit that spot a chip can break off - as was well attested in precious comments. Probably the most common occurrence is with wood-splitting wedges. They get pounded hard all the time, and they often produce flying chips. Always check your wedge heads before use and grind off any split or cracked areas.

Having said all that, I really doubt that hitting a ball-peen hammer to dimple a miter bar is going to cause a flying chip UNLESS the hammer head already has some martensite from previous abuse. It is just not a hard enough blow. Just be sure to check your hammer heads frequently for chipping and cracking and grind off the chipped area or get a new hammer."

Another poster wrote,

"Steel is Steel. If you look up what the hardness is on a typical claw hammer, you'll find it to be Rockwell 50-60. A ball peen hammer may be hardened to 57R. Brick chisels are hardened to 60-61R. What do you hit a brick chisel with? A driving or mash hammer (also hardened to 57R). So what is the difference? I saw the Mythbusters program and they went far beyond the typical tapping. (typical, but that's what Mythbusters does.) You should always wear safety goggles when hitting steel, but unless the hammer is defective, I don't see any difference in using the hammer instead of a drift, but my preference would be to use the correct tool. (the drift)"

This may be getting to the essence of the problem:

"**Case hardened** claw hammer heads are very wear resistant against relatively soft nails. BUT the process leaves a brittle layer that is prone to fracture by impact with a thoroughly hardened surface."

A couple of points to be made is that, again, these remarks are largely about claw-hammers and ball-peen hammers that probably start out a lot harder than a rock hammer. However, bear in mind that splitting wedges are **intended** to be struck by a mallet or sledge hammer. I'm reasonably sure that star drills are pretty hard or they wouldn't work. Although, they may be differentially heat-treated. There is always some risk when hitting something with great force, and that ranges from glancing blows that can hit the person swinging the hammer, to failure of the steel head even when hitting a rock. If we want to be totally safe, we should stay home and watch TV.

I wrote to Estwing for their official position. The following is what I received back:

"Thank you for your email. The general safety rule is that you should never hit another object that is as hard as (or harder than) the steel tool itself. Some types of rock are softer than others. Nail hammers are engineered and designed specifically for hitting common, unhardened nails. Any other use could cause the steel to break which could result in injury. Rock picks are engineered a bit differently as you

can tell by the solid rectangular structure. All of our tools use the same steel (1055 Special Bar Quality) and are heat treated to ASME Safety requirements of 45-60 Rockwell C Standard.

The drilling hammers are much sturdier due to their size and weight, but should still not be used to strike hardened objects directly. The safe way to use these hammers would be in combination with a chisel or punch that has a **struck face that is no more than half the diameter of the striking face of the drilling hammer** [emphasis added: CHS] (such as our rock chisels). Rock picks are best used for prying rock from the ground. The hammer end can be used for light duty work, but again should not be used to strike any object that is harder than the steel itself.”

My response to her was, “How is one supposed to know if a rock might be harder than the steel hammer before hitting it? If rock hammers can only be used for ‘light duty work,’ they would be practically useless for what a mineral or rock collector needs to break a rock. I’m a graduate geologist and I have been using Estwing (and Plumb) rock hammers since the 1960s and have never encountered a problem with a hammer despite hitting rocks with as much force as my six-foot frame will allow me. Yet, there numerous horror stories about people being seriously injured from nail hammers. You suggest that a nail hammer is engineered differently, but you don’t provide specifics. As to being ‘best used for prying rock from the ground,’ it is obvious you have never personally used a geology hammer or observed the typical user of a geology hammer. The typical use by a geologist is to break off a sample from a large boulder or cliff face with multiple blows from the hammer face, and perhaps use the curved-pick end to widen a crack in an exposed outcrop.”

I got a call from the Estwing VP of Engineering and we talked for about a half hour. He himself carries a piece of steel in his hand – from a claw hammer!

He assured me that all Estwing hammers are heat-treated and tempered the same, to ASME standards. What that means is that the bodies and shanks (if steel) are tempered to <40 HRC (Rockwell hardness, C-scale); the striking faces to low-50s HRC. Gad-pry bars, and typical chisels, such as mineral collectors might commonly use, are tempered to about 45 HRC on the striking surface. A brick-chisel cutting-edge is tempered in the range of 35-55 HRC

Metal-cutting chisels, what are commonly called ‘cold chisels,’ are heat-treated and tempered to 48-60 HRC on the cutting edges, while the struck heads are tempered to <45 HRC. However, I own a Chinese-made cold chisel that I bought at Harbor Freight and Tools that I am certain is of the same hardness throughout! So, one has to take into consideration that not all chisels may be as safe as the Estwing products.

Lastly, after the conversation with the Estwing VP of Engineering, I took a file to my Plumb nail hammer and could hardly touch the face! However, I was more successful in removing some of the burrs on my long-handled Estwing rock hammer. That may be in part because I have never dressed the face of the nail hammer after 30 years; however, I have dressed the face of my rock hammer on a grinding wheel several times and may have gotten down through a harder surface layer. Indeed, throughout my life, I have worn out several rock hammers; usually the pick end has become so short as to no longer be useful.

We want to be safe, but we have to be practical in that our objectives are to turn big rocks into small rocks and no amount of chisel work is as effective as hitting a rock with a rock hammer! Being unnecessarily conservative or cautious defeats our purpose.

I’m at a loss to explain why nail hammers seem to be the implement commonly responsible for serious injuries from shrapnel, while I’ve never experienced the problem with a rock hammer, and don’t know anyone who has experienced it. Perhaps it’s just that there are far more people using (and misusing) nail hammers than rock hammers. Another

consideration is that, except for quartz veins and chert boulders, there are very few rocks that are truly harder than heat-treated tool steel. Some rocks can be unbelievably tough and difficult to break even with a large sledgehammer, but are not actually harder as measured by resistance to indentation. Also, polymineralic rocks and even monomineralic rocks with a 'felted' texture (like jade) are less likely to fail by brittle breakage than are monomineralic rocks like quartz and chert.

Apparently, the key to safe use is to use a hammer and chisel combination where the chisel is much smaller than the striking face of the hammer. (Although, this isn't possible when hitting a gad-pry bar unless one uses a drilling or engineers hammer. And, we don't always want to carry the extra weight when working our way over a blast pile.) This minimizes the chance of a flake coming off the edge of the hammer face and flying in the direction of the user if the blow is off-center. That is, it minimizes the chance of a glancing blow similar to what flint knappers try to achieve to make flint tools. From what I have read, I would strongly advise against using a nail hammer for mineral collecting!

While at the recent Denver mineral show, I noticed a new Estwing rock hammer that one of the dealers had on display. To my surprise, there was a warning in yellow letters, on the side of the head, not to strike anything with the pick end of the hammer. That is interesting because the recent Ward's Science catalog I received contains the following description of the long-handled Estwing rock hammer: "Pointed tip for hard-rock geology work."

Obviously, a corporation has to be careful as to what it publicly recommends out of concern that the kind of person who sues McDonalds for spilling hot coffee on themselves might sue them for not telling them to use caution in the use of hand tools. I think that the message in our safety classes should be to use common sense and try to use tools in the manner recommended by the manufacturer, which are probably conservative rules. Note that striking a nail hammer with another nail hammer violates the rule of having the striking head twice as large as the object being struck. [Note that in the photo above, the striking hammer has a face larger than the hammer I'm hitting.] Unfortunately, if the boulders we are commonly trying to reduce in size were smaller than the striking face of the hammer, we wouldn't need to hit them! So, sometimes we have to 'live on the edge.'

Quarry Travel / Event Guide

Month	Event Details	Field Trip or Other Details
NOVEMBER	<p>TITLE: Micro-mineral Symposium</p> <p>DATE/TIME: November 4-6</p> <p>LOCATION: Cleveland Museum of Natural History, Cleveland, OH</p> <p>HOST/COORDINATOR: David Saja (dsaja@cmnh.org)</p> <p>ACTIVITY: General membership meeting and elections on Saturday Nov 5 at 3:00 PM</p>	<p>This is our November Chapter meeting with Elections</p>
	<p>TITLE: OAIMA Trade Show</p> <p>DATE/TIME: November 17-18</p> <p>LOCATION: Hilton Columbus Hotel, Easton Town Center, Columbus, OH</p> <p>HOST/COORDINATOR: Pat Jacomet (patj@oaima.org)</p> <p>ACTIVITY: Booth</p>	<p>Have Not Confirmed Participation Yet</p>

