

# ROCK CHATTER

Published by West Central Illinois Rock and Mineral  
Club of Macomb, Illinois  
Member of AFMS, MWF, and GESCI

Objective: To promote interest and education in  
Earth Sciences and all related fields.  
Volume 22, Bulletin 9, October 2018

## Annual Auction Monday, October 1, 2018, 6:00 p.m. Trinity Lutheran Church, 123 Campbell, Macomb

### ALLUVIUM -October, 2018

Flying kind of blind here after missing last months meeting- so here we go. I trust everything went well there and I myself have most of my voice back, though it gets scratchy late in the day. Hope it is over entirely by meeting time.

In October we will be doing our annual auction at the meeting. Please plan to be there! Money raised during the auction stays in the club treasury and funds expenses throughout the year. Meeting date is October 1st and we return to "winter" start time and begin at 6pm. We want to have the building open by 5:30 to begin setting up, have a short business meeting and begin the auction as early as possible.

In the past, we have had rocks, minerals, fossils, jewelry, pies, cookies, home- made jellies and many other things go through. Please plan to donate-just about anything-and bid.

The weekend after our meeting will be this year's annual LOESS Rock and Gem Show in Springfield along with the MWF meetings which are held in conjunction with this year's show- so there is a lot of goodies coming up.

Enjoy the beautiful weather and hope the real cold stuff stays away for at least another six months...

See you on the 1st- we begin at 6!

*Rob*

### Minutes from the September Meeting

Those in attendance were Ron and Dee Sharf, Dave and Linda Hess, JC and Donna Moore, Ron Bishop, Pieper Bishop and Jackie Sullivan.

Secretary's report – Jackie moved to accept the minutes. JC seconded, minutes were approved.

Treasurer's report – Beginning balance - \$841.04

Expenses - \$50.00 (stamps)

Receipts - \$0

Ending balance - \$791.04

Dave moved to accept the report as given. Ron seconded, report was approved.

Old Business – The L.O.E.S.S. show will be held Oct. 6

(See Minutes continued, page 3)



### News from the

Sandy Fuller, from Rock Biz, is finishing her term as President of the AFMS. J.C. Moore is serving as 5th Vice President of the AFMS. The presidents and regional vice presidents rotate through the seven federations. The vice presidents are nominated by their federations, then voted on at the AFMS Conventions. The president travels throughout the United States during his/her year of service visiting the various federation conventions. Sandy will be in attendance at our show and meetings in Springfield.



### News from the Midwest Federation

The Executive Committee of the Midwest Federation has several chairmanships that are presently vacant and need to be filled. The positions of Endowment Fund, Environment and Legislation, Club Rockhound of the Year, Bulletin Editors Aids, Merit Awards and Silent Auction will be open next year. If you might be interested in serving the MWF, talk to J.C. or Donna Moore to see what these jobs might involve.



### News from Geodeland Earth Science Clubs, Inc.

The 2018 MWF Convention will be hosted by LOESS in Springfield, Illinois, October 6-7, 2018. Even if you don't plan to attend the meetings, you are encouraged to go to the show. There are quite a few vendors and demonstrators that are different from our GESCI Show, so more and different things to see and do.

If you happen to be on the WIU Campus, stop by and see the Fox Room display of geodes. There are some very interesting specimens there. The theme for our 2019 Geodeland Show is geodes. So, if you have some geodes that others would be interested in seeing, set them aside for the club display or plan to do your own display for the show.

## **2018 SHOW CALENDAR**

### **October 2018**

**6-7: SPRINGFIELD, IL Lincoln Orbit Earth Science Society Annual Show. Sat 10 am - 6 pm; Sun 10 am - 5 pm. Orr Building, Illinois State Fairgrounds, 801 Sangamon Ave, Springfield.**

6-7: JACKSONVILLE, AR Central Arkansas Gem, Mineral & Geology Society Annual Show. 9 am - 5 pm both days. Jacksonville Community Center, 5 Municipal Dr.,

6-7: OMAHA, NE Nebraska Mineral & Gem Club Annual Show. Sat 9 am - 6 pm; Sun 10 am - 5 pm. Westside Middle School, 8601 Arbor Street.

12-14: WARREN, MI Michigan Mineralogical Society Annual Show. Fri 9 am - 6 pm; Sat 10 am - 7 pm; Sun 11 am - 5 pm. Macomb Sports & Expo Center, 14500 E. 12 Mile Rd.

13-14: COLUMBUS, NE The Loup Valley Gem & Mineral Society Annual Show. Sat 9 am - 5 pm; Sun 10 am - 4 pm. First United Methodist Church, Outreach Center, 3602 - 16th St.

19-21: MASON, MI Central Michigan Lapidary & Mineral Society Annual Show. Fri 6 - 9 pm; Sat 10 am - 6 pm; Sun 11 am - 5 pm. Main Arena Ingham County Fairgrounds, 700 Ash St.

19-21: FORT WAYNE, IN Three Rivers Gem & Mineral Society Annual Show. Fri & Sat 10 am - 6 pm; Sun 11 am - 5 pm. Allen County Fairgrounds, 2726 Carroll Rd.,

20-21: SPRINGFIELD, MO Ozark Mountain Gem & Mineral Society Annual Show. Sat 10 am - 5 pm; Sun 10 am - 4:30 pm. Springfield Expo, 635 St. Louis St.

20-21: CLIO, MI Flint Rock & Gem Club Annual Show. 10 am - 5 pm each day. Carter Middle School, Rogers Lodge Dr.

20-21: DES MOINES, IA Des Moines Lapidary Society Annual Show. Sat 9 am - 5 pm; Sun 10 am - 4 pm. Elwell Family Food Center, IA State Fairgrounds, 3000 E. Grand Ave.

20-21: COTTAGE GROVE, MN Minnesota Mineral Club Annual Show. Sat 10 am - 5 pm; Sun 10 am - 4 pm. Cottage Grove National Guard Training & Community Center, 8180 Belden Blvd.,

20-21: CHICAGO HEIGHTS, IL South Suburban Earth Science Club Annual Show. 10 am - 5 pm both days. Prairie State College, 202 South Halsted St.

27-28: CUYAHOGA FALLS, OH Summit Lapidary Club Semi-Annual Show. Sat 10 am - 6 pm; Sun 10 am - 5 pm. Emidio and Sons Expo Center, 48 East Bath Rd.,

27-28: EVANSVILLE, IN Evansville Lapidary Society Annual Show & Rock Swap. Sat 10 am - 5 pm; Sun 10 am - 4 pm. CK Newsome Community Center, 100 E. Walnut St.

### **November 2018**

3-4: STURTEVANT, WI Racine Geological Society Annual Show. Sat 10 am - 5 pm; Sun 10 am - 4 pm. Fountain Hall, 8505 Durand Ave, Sturtevant.

3-4: MIDLAND, MI Mid-Michigan Rock Club Annual Show. 9 am - 4 pm each day. Chippewa Nature Center, 400 S. Badour Rd.

10: QUINCY, IL Gem City Rock Club Annual Show, 10 am - 5 pm. Community Room in Quincy Mall, 32nd & Broadway

10-11: FREEPORT, IL Northwest Illinois Rock Club Annual Show. Sat 9 am - 5 pm; Sun 10 am - 4 pm. Highland Community College, 2998 West Pearl City Rd.

12: BLOOMFIELD HILLS, MI Michigan Mineralogical Society Annual Auction. Cranbrook Institute of Science, 3922 Woodward Ave.

16-18: FENTON, MO St. Louis Mineral & Gem Society Annual Show. Fri 3 - 7 pm; Sat 10 am - 7 pm; Sun 10 am - 5 pm. Affton White-Rodgers Community Center, 9801 MacKenzie Rd.

17-18: TOLEDO, OH Toledo Gem & Rockhound Club Rock/Jewelry Open House. Sat 9:30 am - 4:30 pm; Sun noon - 4 pm. St. James Lutheran Church Gym, 4727 West Sylvania Ave, Toledo.

17-18: CRYSTAL, MN Anoka County Gem & Mineral Club Annual Show. Sat 10 am - 5 pm; Sun 10 am - 4 pm. Crystal Community Center, 4800 Douglas Dr., Crystal.

17-18: MADISON, WI Madison Gem & Mineral Club Annual Show. Sat 9:30 am - 5 pm; Sun 10 am - 5 pm. Alliant Energy Center, 1919 Alliant Energy Ctr Way,

## **2019 Conventions**

The combined MWF and AFMS Convention will be hosted by the Cedar Valley Rocks and Minerals Society, Cedar Rapids, Iowa, on March 23-24, 2019.

(Minutes, continued from page 1)

If anyone has a chance to attend, I am sure Donna and Deb would love some extra help in the concessions area. The MWF convention will be held along with the Springfield show. Ron and Dee Sharf will be our club's delegate and alternate for the annual meeting.

There will be a Gem City Rock & Mineral Show held in the Quincy Mall in Quincy, Illinois on Nov.10.

We still have 2 T-shirts left (1 XL and 1 2XL) Get in touch with Donna or JC if you are interested in purchasing one. The group would like to consider taking an extended field trip. Some locations mentioned were Arkansas for diamonds and quartz, North Carolina for a variety of materials and Missouri for drusy quartz and lace agate. If you have any other suggestions, please let the club know so plans can be started. We want to be sure to go either early or late in the year to avoid excessive heat and of course SNAKES!

JC is still taking orders for the Gem Shop agate calendars we have been ordering the past few years. When we order as a group there is a significant savings.

October 1 at 6 pm we will be holding the club's annual auction. We are later this year due to multiple conflicts with the usual April date. Please bring hobby related or edible donations and come prepared to bid. This is always a fun event and usually our only fundraiser. Although the meeting begins at 6, Rob has requested we try to arrive by 5:30 so we can be ready to go by 6.

New Business –MWF officer election ballot was discussed. Though most offices were unopposed, the group did vote on the nominating committee which had 4 candidates. JC moved that we accept the vote and Dee seconded. Rob will complete the ballot and handle getting it mailed. Jackie moved to adjourn the meeting. JC seconded, and meeting was adjourned. Our program for the evening was about rock and mineral identification.

Next Meeting – October 1, 2018 in the basement of the Trinity Lutheran Church, 123 S. Campbell St., Macomb, IL. at 6 pm –

Respectfully submitted,  
Jackie Sullivan

**Having Fun: Junior Activities**  
By Jim Brace-Thompson, Juniors Program Chair  
**Classic American Fossil Sites  
for Earth Science Education**  
(From October 2018 AFMS Newsletter)

In this column several years ago (November 2013, to be exact), I reported on a book by Albert B. Dickas entitled *101 American Geo-Sites You've Gotta See* (Mountain Press, 2012). I noted how Dickas helps you take kids to sites that tell unique geological stories; for instance, dramatic evidence of an ancient meteorite strike in Alabama, a view of the Pacific plate sliding

by the North American plate along California's San Andreas Fault, fossil-bearing ash beds in Nebraska that tell of an unimaginably immense volcanic eruption in ancient Idaho 12 million years ago, or evidence of a tropical sea as well as massive glaciation in Ohio. With 101 sites included across all 50 U.S. states, you should be able to find a locality within reasonable distance for a day- or weekend trip for your club's pebble pups and juniors.

Well, Dickas has done it again! He has just published *101 American Fossil Sites You've Gotta See* (Mountain Press, 2018). The book opens with a quick romp through the history of paleontology as a science, provides the basics of fossils and fossilization, and explores the history of life on Earth, eon-by-eon, period-by-period. Then comes the real meat of the book: the 101 sites from Alabama to Wyoming (including Alaska and Hawaii). Each site entry consists of a two-page spread. The opening page provides GPS coordinates, a one-sentence overview of the significance of the site, and an overall description and paleontological history. The second page provides colorful supporting illustrations, maps, and photos. Printed on high-quality glossy paper, the photos make it a wonderful coffee-table book in addition to an informative read. Additional helpful info is provided in an end-of-book glossary and a reference section supplying four additional suggested readings for each site.

The sites include those where viewing-only is allowed (for instance, Arizona's Petrified Forest or Oregon's John Day Fossil Beds National Monument) but also a wonderful assortment where hands-on collecting is not only allowed but encouraged. I've been to 22 of the 101 sites from California to New Jersey and points between, and from first-hand knowledge of those sites, I can assure you that Dickas has chosen wisely. All are worth considering as field trip destinations for your club's kids—and are sure to provide a whole lot of fun!

## **AFMS Land Use Policy**

1. Adherence to the AFMS Code of Ethics assures compliance with most statutes and regulations governing collecting on public lands and encourages respect for private property rights and the environment. Clubs are urged to read the AFMS Code of Ethics in at least one meeting every year, to publish the Code frequently in the club newsletter, and to compel compliance on club field trips.
2. Individuals and clubs are urged to write their elected representatives and land use management agency supervisors regarding issues of rule making, legislation and enforcement affecting field collecting of minerals and fossils.
3. Individuals and clubs are urged to join and support activities of the American Lands Access Association (ALAA), a sister organization with responsibility for advancing the interests of earth science amateurs with legislatures and land use management agencies. (Continued page 6)

## THE HARDNESS OF ROCKS AND MINERALS

Dr. Bill Cordua  
University of Wisconsin-River Falls

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Hardness tests of minerals are among the easiest and most useful tests to perform. What rockhounds speak of as hardness is more accurately described as resistance to abrasion. We are testing how easily one substance will scratch another. As an example, copper is relatively easy to scratch, but would you bet on diamond or copper standing up better to blows from a hammer? Hammer blows measure the ease with which something fractures or its tenacity. There are other hardness scales than are based on ease of indentation, resistance to twisting and so forth. For the sake of simplicity and standard usage, in these articles, hardness will refer to the resistance to abrasion as given by Mohs' Scale.

The classic scale for hardness was published in 1822 by Frederick Mohs, an Austrian mineralogist who got the basic concept from scratch tests performed routinely by miners. Since Mohs published the scale, it bears his name rather than that of the unknown genius who thought of it. The scale selects 10 minerals as standards, arranging in order of increasing hardness. These are, as most of you probably know:

- 1 = Talc
- 2 = Gypsum
- 3 = Calcite
- 4 = Fluorite
- 5 = Apatite (fluorapatite)
- 6 = Orthoclase
- 7 = Quartz
- 8 = Topaz
- 9 = Corundum
- 10 = Diamond

These minerals were selected for their abundance, as well as their differing hardness. The scale is uneven. For example, diamond at 10 is much harder than corundum at 9, while fluorite at 4 is only slightly higher than calcite at 3.

A more limited but practical scale can be easily and cheaply obtained by observing your fingernail has a hardness of 2.5, a penny has a hardness of about 3.5, glass and a steel nail have nearly equal hardnesses of 5.5 and a streak plate has a hardness of 6.5. If I carry a nail and streak plate with me and can scrounge up a penny, I've got a handy, light weight mineral testing lab in my pocket.

More expensive sets can be bought. A set with small samples of all of Mohs' minerals allows a bit more precision

in testing. The specimens do lose their usefulness the more they are scratched up in various tests. As an alternative, one can custom build their own Mohs set through collecting or purchasing small fragments of the needed minerals. Other vendors provide sets of hardness pencils with tips of two natural or artificial substances of measured hardness. These are handy in that they are very precise and allow one to test a small surface easily.

Most mineralogy texts give tables of mineral hardness. Particularly complete and useful tables appear in John Sinkankas' "Gemstone and Mineral Data Book."

Doing hardness tests requires some technique. You need to find a good surface or edge on your unknown to test. Take care to make sure you are testing the right grain - not the bit of quartz right next to it. In some case it is easier to scratch the unknown across the standard. (the point of a unknown mineral grain across a calcite cleavage). In other cases it is easier to test the standard across the unknown ( tip of a nail across cleavage surface of the unknown grain). In an ideal case, you should try to do both, to double check your findings. You need to press hard enough to good effect, but not so hard as to fracture either sample. Practice will help you get the proper level of stress to exert.

As a result of your test, you will look for a scratch. Rub aside any powder to see if a distinct scratch has been left. Calcite will leave a trail of powder across quartz. Rub away the powder and you'll see the quartz is unharmed. A hand lens will help you see the scratch. In this way you can bracket the hardness of your unknown between two of your standards (harder than a fingernail, softer than a penny). The ease with which one substance scratches another is also useful. Quartz easily scratches calcite, telling you of a large hardness difference. Quartz will scratch feldspar with much more difficulty. When testing a standard against an unknown that is of equal hardness, both substances will leave shallow scratches on each other.

The hardness of a particular mineral may vary with direction within the same grain. Kyanite is a good example. Kyanite generally occurs in long bladed crystals. The hardness taken the short way across the blade has a hardness of 7 the hardness taken the long way along the same grain will be 4.0. Muscovite is another good example of this. Its hardness is 2.5 when taken across a the flat surface of a cleavage sheet, but 4 when taken across the grain of a book.

The reason hardness varies in this way is that the phenomenon depends on the strength of the bonds holding the mineral together. The bond strength can be significantly different in different directions in the mineral, giving the different hardness. In most minerals this difference with direction is minor and doesn't affect the test. In the case of kyanite, this difference in hardness is a confirming test by itself.

Some minerals' hardness may vary from sample to sample

Hardness, continued from page 4

depending on that mineral's exact chemical composition. Hornblende's hardness can vary from 5 to 6, meaning some hornblende is softer than glass, some harder. This reflects the fact that hornblende can accommodate varying amounts of sodium, calcium, iron and magnesium in its structure, which affect the details of its chemical bonding, hence its hardness.

Testing the hardness of rocks is less effective than testing the hardness of minerals. A rock is basically a mixture of various minerals, although it can contain non-mineral materials such as natural glass and fossils. (Fossils aren't minerals because they are organic, while glass isn't a mineral because it lacks an internal crystalline structure). Let's take a granite pegmatite for example. This might contain grains of topaz (H= 8), quartz (H=7), feldspars (H=6) and muscovite mica (H= 2.5). You could thus get a range of hardness depending on which grain you tested. In a coarse grained rock, identifying the individual minerals allows you to identify the rock. If the rock is fine-grained, it's harder to interpret the results.

The hardness of fine-grained rocks tends to reflect the average hardness of the minerals in them. Shales are made mostly of clay and tend to be soft. Limestones and dolostones are also soft, with a hardness of 3-4. Just watch out if quartz sand is present mixed with the carbonates! Quartzite and chert being made mostly of quartz are both very hard. The hardness of sandstone may be difficult to test. If the sand grains have not been cemented well or have been cemented by calcite, the sandstone will seem softer. The individual quartz sand grains will still have a hardness of 7, but the rock may crumble or disaggregate in your hand, making it look soft. If you think it is really soft, trying dragging the disaggregated sand grains across a piece of glass and you'll readily see the effects. Most igneous and metamorphic rocks contain much feldspar, quartz, pyroxenes and amphiboles. Their hardness is thus going to be between 6 and 7. This means hardness is not a good way to distinguish one of these rocks from another. Volcanic glass will typically have a hardness of 5.5 - 6.0 depending on its particular chemical composition.

The hardness of rocks and minerals is also dependent on the degree of weathering. Weathering may convert feldspars (H=6) to clay minerals (H =2 -3) Even corundum (H=9) can alter and have rims of softer minerals such as margarite (H= 3.5-4.5 ) around it. This is why it is important to test as fresh or unweathered a surface as you can while doing hardness tests.

Mohs' scale has stood the test of centuries as a useful tool for mineral identification. Its simplicity and effectiveness will likely assure its relevance well into the future.

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## AFMS Code of Ethics

I will respect both private and public property and will do no collecting on privately owned land without the owner's permission.

I will keep informed on all laws, regulations of rules governing collecting on public lands and will observe them.

I will to the best of my ability, ascertain the boundary lines of property on which I plan to collect.

I will use no firearms or blasting material in collecting areas.

I will cause no willful damage to property of any kind - fences, signs, buildings.

I will leave all gates as found.

I will build fires in designated or safe places only and will be certain they are completely extinguished before leaving the area.

I will discard no burning material - matches, cigarettes, etc.

I will fill all excavation holes which may be dangerous to livestock.

I will not contaminate wells, creeks or other water supply.

I will cause no willful damage to collecting material and will take home only what I can reasonably use.

I will practice conservation and undertake to utilize fully and well the materials I have collected and will recycle my surplus for the pleasure and benefit of others.

I will support the rockhound project H.E.L.P. (Help Eliminate Litter Please) and Will leave all collecting areas devoid of litter, regardless of how found.

I will cooperate with field trip leaders and those in designated authority in all collecting areas.

I will report to my club or Federation officers, Bureau of Land management or other authorities, any deposit of petrified wood or other materials on public lands which should be protected for the enjoyment of future generations for public educational and scientific purposes.

I will appreciate and protect our heritage of natural resources.

I will observe the "Golden Rule", will use "Good Outdoor Manners" and will at all times conduct myself in a manner which will add to the stature and Public "image" of rockhounds everywhere.

(Editor's Note: It doesn't hurt to review these periodically so we are reminded how to respect property when we go on collecting trips.)

(Continued from page 3)

4. The AFMS will receive a report from ALAA at its annual meeting.
5. The AFMS endorses the principle of multiple use of public lands as a guarantee of continuing recreational opportunities.
6. Wilderness and monument designations are inconsistent with the principle of multiple use. In view of the vast amount of public land already designated as wilderness and monuments, future such designations should be minimal, taking into account the increased demand for recreational opportunities, including rockhounding, created by a growing population.
7. In furtherance of the principle of multiple use, the AFMS believes that laws, regulations and rules established by relevant governmental authorities should be designed to allow freest possible access to all public lands, coupled with minimal restrictions on the recreational collection of minerals, fossils, gemstone materials and other naturally occurring materials.
8. A right to collect minerals and fossils on public lands should be protected by statute.
9. The AFMS urges its members to work with any or all government authorities to achieve a good working relationship in order to improve the "Public Image" of recreational collectors.

## WCIR&MC Officers

President	Rob Heath 772-2729
Vice-President	Donna Moore 789-6501
Secretary	Jackie Sullivan 313-2826
Assistant Secretary	Dee Sharf 253-7300
Treasurer	J.C. Moore 789-6501
Newsletter Editor	Donna Moore 789-6501
GESCI Board Representatives	J.C. Moore 789-6501 Dee Sharf 253-7300 Donna Moore 789-6501

All numbers are in 309 area code.

### Meetings

The first Monday of each month (except September, which is the second Monday) at the Trinity Lutheran Church, 123 S. Campbell St., Macomb at 6:00 p.m. (Oct. - March). April through September meetings at 7:00 p.m. May meeting is usually held at Western Illinois University. Call Rob or Donna if you are concerned about weather related cancellations or have other questions about meetings.

### Dues (per year)

Individual	\$10.00
Family or individual sponsoring juniors	\$15.00

### ROCK CHATTER PUBLICATION

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