



Volume 67 ♦ Number 05 ♦ May 2021 ♦ A monthly newsletter for and by the members of MAGS

# May Program

Dr. Michael A. Gibson

The University of Tennessee at Martin Coon Creek Science Center



The most famous fossil deposit in West Tennessee is arguably the Cretaceous Coon Creek lagerstätte deposit exposed at what was originally called the “Old Dave Weeks Place”. The deposit is well-known to paleontologists globally and a favorite of fos-

sil collectors. The original site has had a long history that is entering a new phase that was commemorated with a ribbon-cutting ceremony on April 30, 2021, at which time the University of Tennessee at Martin publicly announced its newest role in the

*Continued, P. 3*

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### ROCK SWAP!

The first MAGS Rock Swap in over a year will be on Saturday, May 29, 10:00 A. M. to 2:00 P. M., at the home (driveway, at least) of Lou White, 3805 Melanie June Lane, in Bartlett. Bring all those specimens you’ve been hoarding to Lou’s place—or just come—and spend some time partying with your friends.



You can bring packaged snacks to share if you like. MAGS will supply beverages and ice. We’ll observe the necessary precautions (please wear masks), but otherwise this event will be like the rock swaps we used to have. We’re looking forward to a good crowd, so come early.

See you there.

JANE COOP

# MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

MAGS Rockhound News ◊ A monthly newsletter for and by the members of MAGS

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## MAGS AND FEDERATION NOTES

Memphis Archaeological and Geological Society,  
Memphis, Tennessee

The objectives of this society shall be as set out in the Charter of Incorporation issued by the State of Tennessee on September 29, 1958, as follows: for the purpose of promoting an active interest in the geological finds and data by scientific methods; to offer possible assistance to any archaeologist or geologist in the general area covered by the work and purposes of this society; to discourage commercialization of archaeology and work to its elimination and to assist in the younger members of the society; to publicize and create further public interest in the archaeological and geological field in the general area of the Mid-South and conduct means of displaying, publishing and conducting public forums for scientific and educational purposes.

MAGS General Membership Meetings and MAGS Youth Meetings are held at 7:00 P. M. on the second Friday of every month, year round. The meetings are held in the Fellowship Hall of Shady Grove Presbyterian Church, 5530 Shady Grove Road, Memphis, Tennessee.

MAGS Website: [memphisgeology.org](http://memphisgeology.org)

MAGS Show Website: [www.theearthwideopen.com](http://www.theearthwideopen.com) or <https://earthwideopen.wixsite.com/rocks>

We aren't kidding when we say this is a newsletter for and by the members of MAGS. An article with a byline was written by a MAGS Member, unless explicitly stated otherwise. If there is no byline, the article was written or compiled by the Editor. Please contribute articles or pictures on any subject of interest to rockhounds. If it interests you it probably interests others. The 15th of the month is the deadline for next month's issue. Send material to [lybanon@earthlink.net](mailto:lybanon@earthlink.net).

All 2021 DMC field trips have been cancelled and rescheduled to 2022. The next MAGS-sponsored trip is currently scheduled for October 2024.

### Links to Federation News

- ➔ AFMS: [www.amfed.org/afms\\_news.htm](http://www.amfed.org/afms_news.htm)
- ➔ SFMS: [www.amfed.org/sfms/](http://www.amfed.org/sfms/)
- ➔ DMC: [www.amfed.org/sfms/dmc/dmc.htm](http://www.amfed.org/sfms/dmc/dmc.htm)



*May Program* site for the next  
*Continued from P. 1* forty years or  
more. The jour-  
ney to the ribbon cutting ceremony  
was quite literally 72 million  
years in the making! It represents  
the next step in a long line of  
fierce determination and passion  
to promote and develop geo-  
science education, research, and  
outreach across our region by  
people and institutions that held  
vision. The road to this point be-  
gan over 72 million-years-ago with  
the deposition of the sediments  
and entombment of fossils that  
lived in our region during what  
was the largest global warming  
event in Earth history and the  
highest sea level that Earth has  
ever witnessed. The future Dave  
Weeks Place became important in  
the late 1800s when the Weeks  
family worked the farmland, dis-  
covering that feeding ground-up  
fossils shells to their chickens en-  
hanced eggshell formation. Weeks  
opened his land to scientific study  
to another Tennessee native. The  
site's scientific significance was  
solidified in 1926 when Trenton,  
Tennessee, native, Vanderbilt ge-  
ology graduate, and Johns Hopkins  
University Ph. D. student Bruce  
Wade published the first scientific  
study of the site and brought it to  
the attention of the U. S. Geologi-  
cal Survey, Smithsonian Institu-  
tion, and many other scientists  
globally. In 1953, A. Z. Smith pur-  
chased the site, and recognizing its  
scientific important, guaranteed  
access for intensive study by sci-  
entists from around the world and  
created the region's first Fossil  
Farm available to the general pub-  
lic. The Pink Palace Museum and  
the City of Memphis guaranteed

the fossil site's preservation and  
conservation in 1988 when it ac-  
quired the site and built the Coon  
Creek Science Center. They in-  
vested time and money to build  
the field station that currently ex-  
ists on the property and developed  
extensive educational programing  
for the public.

Beginning in the early 1990s,  
UT Martin geoscientists partnered  
with the Pink Palace in a unique  
and successful partnership collab-  
oration that further established  
the site as one of the premier fos-  
sils sites for research and field-  
based STEM education in the re-  
gion. Over the past 10 years, there  
were numerous efforts to evolve  
the relationship between the  
Coon Creek Science Center and  
UT Martin to give UT Martin  
more direct control over the site  
and enhance its research and edu-  
cation potential. We successfully  
signed a long-term lease agree-  
ment with Memphis Museums in  
March 2020, and immediately got  
to work with over \$50,000 worth  
in upgrades. The partnership be-  
tween UT Martin and the Pink  
Palace is thus strengthened and is  
expanding in the future. While the  
Covid-19 pandemic delayed UT  
Martin's opening of the site to the  
public, it has afforded the oppor-  
tunity to conduct repairs, up-  
grades, and expand the resources  
on the site, including construction  
of a complete paleontology lab  
along with climate control to the  
facilities. A ribbon-cutting cere-  
mony was held on April 30, 2021,  
signaling the official opening of  
the UT Martin Coon Creek Sci-  
ence Center. UT Martin's com-  
mitment to the Coon Creek Sci-  
ence Center will provide high-im-

pect educational experiences in  
and out of the classroom and, ad-  
ditionally, will educate responsible  
citizens for careers, professions,  
and service, and impact the area  
economically, while conserving the  
site for future generations. We  
look forward to hosting MAGS at  
the UT Martin Coon Creek Sci-  
ence Center in the near future!

## A Crystal Clovis Point From The Hot Springs Vicinity

*C. Andrew Buchner*



The "Rock Crystal Weapons"  
article in last month's issue de-  
tailed a spectacular find of  
chipped crystal tools from the  
Montelirio Tholos, a megalithic  
mortuary in Spain that dates to ca.  
3000 BCE. The MAGS member-  
ship might be interested in know-  
ing that pre-Columbian crystal  
tools are also occasionally found in  
the Mid-South. The picture above  
is one example.

The existence of quartz crystal  
in the Ouachita Mountains has  
been known since humans first  
occupied the area, during what is  
known as the Paleoindian period  
(Howard 2008:1). As many of you  
know, quartz is the state mineral  
of Arkansas and quartz crystals  
occur in a "quartz belt" that is 48-  
64 km wide and extends a distance  
of about 272 km

*Continued, P. 6*

## Two New Minerals

Matthew Lybanon, Editor

### Editor's Note:

This article is based on "Two New Minerals to Science, Named for Arkansas Geologists," by J. Michael Howard, published in the March 2021 issue of *The Hot Springs Bulletin*, the Hot Springs Geology Club's monthly newsletter, and used here by permission from the author.

Many MAGS Members know Mike Howard. He's led MAGS field trips and presented programs at MAGS meetings, as well as participating in our Show. Mike

worked for the Arkansas Geological Survey (aka Arkansas Geological Commission) for 39 years before retiring in 2013, first as a staff geologist and later as a geology supervisor. Recently he and his friend Don Owens, another Arkansas geologist, were recognized for a special accomplishment.

Mike graduated from the University of Arkansas in 1974, and his M. S. thesis was concerned with the distribution of transition elements within the igneous rocks of the Potash Sulphur Springs (PSS) intrusion of Garland County, located 4 miles west of the well known Magnet Cove intrusion and 10 miles east of Hot Springs National Park.

Vanadium deposits at Potash Sulphur Springs consist of highly altered sedimentary rocks, mainly

the Arkansas Novaculite (Mississippian-Devonian) and altered ig-

tion, a loosely knit group of professional and amateur geologists and mineral collectors.

Don and Mike were members of that group for some 25 years.

When mining ended, reclamation began on the open pit mines at Potash Sulphur Springs, so collecting is now greatly restricted. The two major pits are presently full of water, and the T-orebody is overgrown. So the only minerals available for study are those in private collections.

Don moved on and, after many years as an instructor in geology

and mineralogy at the University of Arkansas at Little Rock (Earth Science Department), he retired. When he passed away, his son Paul Owens sold portions of Don's collection to two mineral dealers, Tom Loomis and James Zigras. Mike was then able to purchase some of Don's micro-minerals from both mineral dealers. James Zigras had recently moved to Arkansas and located his business near Jessieville, north of Hot Springs National Park. James sent off some specimens from the Owens collection to be photographed and it was recognized that there may be some new minerals to science in Don's collection. A short time later, James contacted Mike and requested to examine his collection of PSS specimens. When he did in early fall of 2020, he purchased

*Continued, P5*



Orange fibers of **Donowensite** and blackish equant crystals of **Mikehowardite**, NWP, PSS, Garland Co., AR, DRO, ARK, 1.68mm FOV. Type photograph furnished by Anthony Kampf.

neous rocks in and adjacent to the contact metamorphic zone. These deposits were mined from open pits.

The PSS intrusion was known as the location of the Wilson Springs vanadium mines, the only mining operation in the United States producing vanadium oxides as the primary product. Don was then the mine geologist for Union Carbide on that site.

Both Don and Mike collected from the East Wilson, North Wilson, and T-orebody locations, and due to efforts by Charles Milton, research mineralogist of George Washington University, several additional new mineral species were added to the list of minerals from Arkansas, including straczekite and malhmoodite. The PSS mines were also annually collected by the Coon Creek Associa-



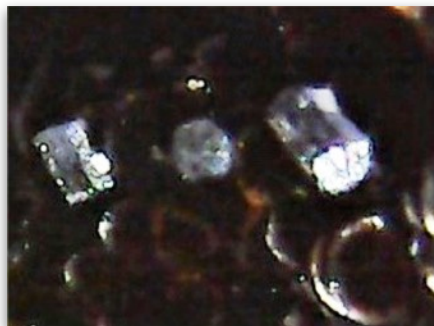
*Two New Minerals* some specimens  
*Continued from P. 4* and hinted that  
there were  
some new species that were being  
worked on from the collection.

In late November of 2020,  
Mike was contacted via email by  
Dr. Anthony Kampf. Dr. Kampf is  
Curator Emeritus, Mineral Sci-  
ences, at the Natural History Mu-  
seum of Los Angeles County, and  
the U. S. delegate to the Commis-  
sion on New Minerals, Nomencla-  
ture, and Classification of the In-  
ternational Mineralogical Associa-  
tion. He requested permission to  
use the name **mikehowardite** for  
one of two new vanadium-bearing  
species, the other mineral to be  
named **donowensite**. Mike gave  
permission.

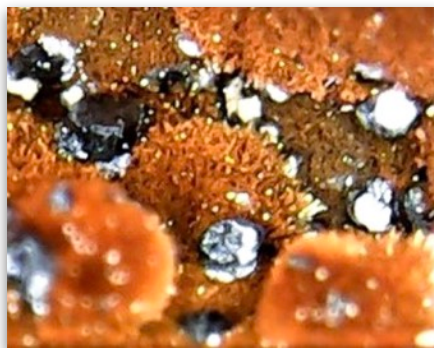
Most of the specimens, recov-  
ered by Owens, are contained  
within what have been called mud  
balls. These mud balls likely  
formed during laterization and  
oxidation of the vanadium ore  
bodies, particularly the North  
Wilson Pit, during the Paleocene,  
as both new species are secondary  
products of alteration. As with a  
couple of other new species,  
malhmoodite and straczekite from  
the same deposit, the distribution  
of these minerals was very re-  
stricted and mined through in a  
few days.

**Mikehowardite** is a true mi-  
cro-mineral, being less than 0.5  
mm, equant, with a high luster and  
appearing as very dark brown to  
black, resplendent crystals at 45X.  
It is triclinic and visually appears  
pseudo-hexagonal. It may be  
formed on or associated with ei-  
ther bokite fibers or mattes, or on  
donowensite fibers within frac-

tures in mud balls.



**Mikehowardite** on bokite,  
North West Pit, Potash Sulfur  
Springs, Garland Co., AR., Don  
Owens collected, J Michael  
Howard Collection, 45X.



**Mikehowardite** with  
**Donowensite**, NWP, PSS, Gar-  
land Co., AR. DRO JMH 45X

**Donowensite** occurs as  
crusts of fine orange to yellow  
needles and mattes of fibers, best  
observed at 40-45X with a micro-  
scope. The mineral coats the walls  
of mud balls and extends out into  
open fractures that look like des-  
iccation cracks, similar to the frac-  
tures seen in septarian nodules,  
though much smaller. Sometimes  
with mikehowardite and some-  
times as small bundles of fibers on  
bokite. Individual fibers may be as  
long as 0.2 mm.

Cotype material is deposited  
in the mineralogical collections of  
the Natural History Museum of  
Los Angeles County, 900 Exposi-



**Donowensite**, NWP, PSS, Gar-  
land Co., AR. DRO JMH 45X

tion Boulevard, Los Angeles, CA  
90007, USA, catalog numbers  
75041 and 75042.

The reader may find both  
Mikehowardite and Donowensite  
on the Internet by searching under  
the names using the links provided  
in the reference list.

#### References:

Kampf, A. R., Hughes, J. M., Nash, B. P.  
& Smith, J. B. (2020). Mikehowardite,  
 $Fe^{3+}4(V^{5+}O_4)4(H_2O)_2 \cdot H_2O$ . New  
mineral approved by the Commis-  
sion on New Minerals, Nomencla-  
ture and Classification (CNMNC)  
of the International Mineralogical  
Association (IMA) IMA 2020-068.  
Vol. 32. European Journal of Miner-  
alogy. Accepted, 12/02/2020. Final  
article to be published in The Cana-  
dian Mineralogist, 2021.

Howard, J. Michael and Owens, Don  
R., 1995, Minerals of the Wilson  
Springs Vanadium Mines, Potash Sul-  
phur Springs, Arkansas: Rocks and  
Minerals, Vol. 70, No. 3, May/June, p.  
154-170. Edited by Raymond Lynch.

[https://www.mineralatlas.eu/lexikon/  
index.php/MineralData?  
mineral=Mikehowardite](https://www.mineralatlas.eu/lexikon/index.php/MineralData?mineral=Mikehowardite)

[https://www.mineralatlas.eu/lexikon/  
index.php/MineralData?  
mineral=Donowensite](https://www.mineralatlas.eu/lexikon/index.php/MineralData?mineral=Donowensite)

# MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

MAGS Rockhound News ♦ A monthly newsletter for and by the members of MAGS

*A Crystal Clovis Point Continued from P. 3* west-southwest from Little Rock, Arkansas, across the Ouachita Mountains into eastern Oklahoma. The principal early source of crystal appears to have been the Crystal Mountains Range in Montgomery County, Arkansas. Prehistoric populations utilized quartz “not just as sacred or magic stones, but also as engraving tools (using the faceted crystal tips), sources of flakes for utilization, and even (despite the difficulty of flaking) as finish tools, including arrow points and other bifaces” (Jeter and Scott 2008:49). One of the most impressive quartz artifacts from the Ouachita Mountains is a Paleoindian period Clovis point that was discovered by a local collector many years ago at the base of a deep quarry in the Hot Springs vicinity. I had the oppor-

tunity to examine this specimen in 2016. Ray (2016) dates Clovis points to 9,350 to 8,850 BCE, thus the quartz Clovis illustrated here is nearly twice as old as the Rock Crystal Weapon cache from Spain, and it is one of the oldest and most beautiful archaeological finds in our region.

## References:

- Howard, J.M., 2008, Arkansas Quartz Crystals. Arkansas Geological Survey Brochure Series 001.
- Jeter, M.D., and R.J. Scott, Jr., 2008, Keo, Quartz Crystals, Carets, Etc: Southerly Plum Bayou vs. Northerly Coles Creek Cultural Elements. *The Arkansas Archeologist* 47:43-82).
- Ray, Jack H., 2016, Projectile Point Types in Missouri and Portions of Adjacent States. Published by the Missouri Archaeological Society, Springfield, MO.

## Wildacres Workshops

We are sorry to report that William Holland has canceled their classes for 2021. They will be back better than ever in 2022. You can check out their Facebook page for the explanation. <https://www.facebook.com/williamhollandlapidaryarts>.

We will still offer the workshops at Wildacres. Go to [www.sfmsworkshops.org](http://www.sfmsworkshops.org) to see descriptions and instructor bios.

Below is a list of classes. They're starting to fill up, so don't wait too long.

### **August 23-29, 2021**

Rowan Morgan—Wire Wrap  
Morning Sherrod—Southwest Silver  
Cindy Moore—Metal Mania  
Jeff Sheer—Special Projects  
Bill Harr—Casting  
Jason Hamilton—Silver II/Filigree

### **September 13-19, 2021**

Chuck Bruce—Silver III/Inlay II  
Micah Kirby—Electro-Etching w/ Silver Fabrication

Jerri Heer—Gem Trees  
Tom Slavicek—Leather  
Marilou Hillenbrand—Chain  
Cindy Moore—Metal Mania  
Bill Harr—Casting  
Teresa Polly—Gem ID

## Field Trips

*Jim Butchko*



The rockhounds came out in force for the hunt for selenite Saturday, April 17. There were about a dozen of us and we found some nice pieces and had a great day. Thanks to Melba and the late Doctor Jim Cole for allowing us the privilege of collecting on their property.

On May 15th we will meet at the Blue Springs fossil site to collect exogyra shells and other fos-

sils from the Mesozoic and Cretaceous Eras. In June (19th) we will head out to Hot Springs, Arkansas, to dig some quartz crystals.

For information call, text, or email Jim Butchko: [j.butchko@yahoo.com](mailto:j.butchko@yahoo.com), (901) 921-3096—cell.

## Upcoming Programs

*Dave Clarke*

Details of the May program are on P. 1 of this issue. Here's what's coming up in the next few months.

- June: Julie Morrow, Pleistocene megafauna fossils
- July: Paul Edson-Lahm, Geology of the Portland Basin (Zoom)
- August: Indoor rock swap (tentative)
- September: Paul Brinkman, T-Rex Sue (at Field Museum)

Later programs are in the works. MAGS Rockhound News will publish the details when they become available.

## Fabulous Tennessee Fossils

Dr. Michael A. Gibson,  
University of Tennessee at Martin

### FTF 76

Xenomorphism, Bioimmuration, and Carrier Shells



Sometimes, biotic interactions in the marine world are not about two organisms directly interacting for a food resource, space, or a mate. Sometimes, apparent biotic interactions are not really an interaction, but merely an association. What is the difference and why make the distinction between interaction and association? Being associated with another organism does not imply any actual purpose to the association and does not even have to have an interaction between the two associated organisms. For example, two seashells may end up buried in the same crab burrow, and may be touching one another, after being washed in. They could have been placed together in a patterned way by the crab. The shells are associated with one another and share a history of transportation and deposition, but other than that, there is no interaction between them. Situations like this are obvious to work out in the modern world where we can observe the process taking place in real time; however, associations from millions of years ago need more definitive evidence to distinguish a seemingly random and fortuitous association from a true interaction with cost and benefits. Remember that for any association to be a true biotic interaction, the two organisms involved need to both be alive at the same time and capable of responding to stimuli from the other organism.

So, when is an association of fossils not a true interaction between the fossil organisms? One such association results from a process called “*xenomorphism*”, which translates into “unusual or changed shape”. Xenomorphism in marine bivalves occurs when the microscopic larvae of the bivalve, such as an oyster, settles onto a substrate to begin metamorphosing into an adult oyster. The substrate can be any hard object (another shell, live or dead, a rock, etc.). As it grows, the oyster shell will conform to the shape of the substrate upon which it is attached. There is clearly an association between the growing oyster and the substrate upon which it is growing, which can be another oyster shell. Oysters are gregarious, so often they are found in groups with members attached to one another to the point that crowding occurs, thus deforming the shells. Generally, no two oyster shells in a gregarious clumping are alike in shell shape, at least not as regular as solitary clams for example. Xenomorphism can occur between two or more live animals (and would then also be a form of symbiosis referred to as commensalism of no other cost or benefit can be discerned) or it can occur between a living shell that settles onto a dead shell and grows according to the shape of the dead shell. In the later case, there is no actual biotic interaction. Instead, this is a taphonomic (post-

mortem) association that could mimic an interaction.

Sometimes the encrusting organism grows larger than its original substrate organism. When this occurs, the original substrate (live or dead) can become incorporated into the shell of the growing organism, sometimes to the point of being completely engulfed into the larger animal’s shell. In the case of *Exogyra* oysters from the Coon Creek Formation, it is usually possible to see part or all of the original hard substrate that the *Exogyra* larva used to begin its growth by looking at the inner whirl near the umbo on the larger, lower valve. That portion of the *Exogyra* will have taken-on the general shape of the substrate shell (Figure 1).

Xenomorphism is a special case of another phenomenon referred to as *bioimmuration*. In bioimmuration, a growing shell engulfs another substrate (shelly or non-shelly) as it grows, thus forming an impression of the engulfed organism in its shell. If both organisms are shelly, then usually the bioimmured shell will be present, but if the engulfed organism is soft bodied or more easily dissolved, then it may be removed later by decay or dissolution and only in imprint remains.

All of the above are considered “biotic associations” for sure, but how about “biotic interactions”? The difficult task for the paleon-

*Continued, P. 8*



*Fabulous Tennessee Fossils* tologist, *Continued from P. 7* who does not get to witness the progress of the association in real time, is to find evidence that the bioimmured (xenomorphic) organism was (1) alive at the time of the encrustation (at least for part of that time) and (2) demonstrated some response to the encruster (at least at some point in the association). This is difficult in many cases.

One particular group of gastropods, the Xenophoridae, routinely demonstrate xenomorphism (Figure 2). Xenophoridae are known as “carrier shells” because of their propensity to collect other objects and shells and glue them into their own whorls as a form of armature. Coon Creek Formation fossilized *Xenophora* (Figure 3), the only carrier shells found as fossils in Tennessee, are usually found as internal molds of the shell (steinkerns) that have the impressions of the carried shells (demonstrating that the carried shell wasn’t just imbedded into the host shell, but extended all the way to the inside of the host’s shell). Modern xenophora are known to glue turritellid shells such that the turritellids act like stilts (Figure 2). These shells can also provide protrusions that allow the snail to rest above the seafloor in finer-grained sediments, analogous to stilts on a house near the ocean. Carrier shells can be very selective as to the type, shape, orientation, and even species of objects and shells it selects to incorporate into its own shell. How do we categorize this association? Many malacologists have postulated on the nature of this behavior. Interpretations

include that the association represents defensive camouflage behavior (visual camouflage, tactile camouflage, and olfactory masking) and defensive armoring. Others argue that the nature of the behavior is purely for functional support (snowshoe effect, increasing shell stability on the substrate, or providing an enhanced feeding posture). To be a true biotic interaction, at least some of the carried shells would have to be demonstrated to be living, which has been demonstrated with living *Xenophora* (they seem to like coral colonies). The determination of a true biotic interaction, as opposed to a biotic association, can be difficult at times. With fossils, often the relationship will be equivocal and rely on persuasive argument more than obvious facts. Regardless, as noted in earlier essays, every fossil has a story to tell and each fossil has the potential to provide incredible insight into the working of past ecosystems.



Figure 1. *Exogyra* oysters from Coon Creek Fm. showing shell attachments and change in shell shape to match those attachment substrates (xenomorphism). Left shell shows bivalve substrate; right shell shows *Turritella* substrate (UTM Coon Creek Fossil Collections; Photo by MAG, centimeter scale).



Figure 2. Modern *Xenophora* shell with oriented shells and rock fragments incorporated into its whorls. (MAG personal shell collection; Photo by MAG, centimeter scale).



Figure 3. Coon Creek Fm. *Xenophora* steinkerns collected by James Safford. The *Xenophora* shell has dissolved away, leaving only the sediment infill. Indentations in the steinkerns show positions of carried shells, which is an example of bioimmuration (UTM Coon Creek Fossil Collections; Photo by MAG, centimeter scale).

### Web Tip: UMORF

<https://umorf.ummp.lsa.umich.edu/wp/> is the University of Michigan Online Repository of Fossils. It’s a project of the University’s Museum of Paleontology, to increase the accessibility of fossil specimens through online 3D and 2D representations.



## Call It A Beautiful Blue

Stephanie Blandin

Llanite is a hypabyssal rhyolite containing phenocrysts of reddish microcline feldspar and blue quartz. The blue quartz phenocrysts are usually euhedral with color zoning from light blue cores to dark blue edges. Quartz phenocrysts retain beta quartz dipyrimal shapes and are up to 5 mm in diameter.



The quartz and microcline phenocrysts are enclosed in a microcrystalline matrix of quartz—34.6%, microcline—27.8%, plagioclase—27.9% biotite—8.6%, minor fluorite—1.0%, magnetite—trace, apatite—0.13%, zircon and ilmenite—trace. To put it more plainly, this igneous rock is a fine-grained granitic rock with phenocrysts of blue quartz and pink-reddish feldspar scattered in a dark brown background.

It is sometimes called llanoite or llanolite. It is named after Llano County, Texas, which—according to locals—is the only location where it is found. However, geologists have identified other locations where this rock may be found, according to Robert Reed (**Editor's note:** Dr. Robert M. Reed,

the University of Texas at Austin Jackson School of Geosciences).

If you want to take a road trip from Llano, Texas, take Highway 16 north for about 8.6 miles and you'll reach the outcropping in a roadcut (**Editor's note:** *Rockhound Times* says the roadcut is near *Baby Head Cemetery*). The GPS coordinates are 30° 44.119' N and 98° 22.147' W. If you pass the rest stop on the west side you've gone too far, according to the Texas Roadrunner website.

They also suggest strong chisels and a sledge hammer. The rock is tough but takes a polish well! It takes 8:17 (536 miles) to get to Llano, Texas, from Little Rock, Arkansas.

The cause of the blue colored quartz is up for debate. Iddings (1904) suggests it was due to "reflection of blue light-waves from the minute colorless prisms, whose width is a fraction of the length of the light waves." He compares this to Rayleigh scattering in the atmosphere.

Burmester and Barker (1970) found zircon in the sample. Based on that, they agreed that inclusions were the cause of the blue color—but with dispersion in the zircon, not Rayleigh scattering.

Frazier and Gobel (1982) suggested submicroscopic rutile inclusions might cause the scattering. The most recent studies (Coblieg and others, 1986; Zolensky and others, 1988) suggested that the blue color was caused by submicrometer-sized ilmenite inclusions.

**Editor's note:** A more recent study (Seifert et al, 2011) concludes

"Rayleigh scattering of light by nanoparticulate inclusions best explains the origin of the blue colour."

No matter what the cause, it's a beautiful blue!

### References:

- Iddings, J. P. (1904) Quartz-feldspar porphyry (graphiphyro liparose-alaskose) from Llano, Texas. *Journal of Geology*, 12, p. 225-231.
- Barker, D. S., and R. F. Burmester, 1970, LM unpublished M.A. thesis, University of Texas, Austin, Texas. 73 pp.
- Frazier, A. S. and Gobel, V.W. (1982) Rutile as cause of blue color of quartz from llanite, Llano County, Texas. *Geological Society of America, Abstracts with Programs*, 14, 111.
- Coblieg, T., M. E. Zolensky, and P. J. Sylvester, 1986, Why is blue quartz blue? *Abstracts with Programs - Geological Society of America*. vol. 18, no. 6, pp. 567.
- Zolensky, M.E., Sylvester, P.J., and Paces, J.B. (1988) Origin and significance of blue coloration in quartz from Llano rhyolite (llanite), north-central Llano County, Texas. *Am. Min.* v. 73, p. 313-323.
- Seifert, W. & Rhede, Dieter & Thomas, Rainer & Förster, H.-J & Lucassen, F. & Dulski, P. & Wirth, R., (2011). Distinctive properties of rock-forming blue quartz: Inferences from a multi-analytical study of submicron mineral inclusions. *Mineralogical Magazine*. 75. 2519-2534. 10.1180/minmag.2011.075.4.2519.

### March Board Minutes

Mike Coulson

Zoom meeting called to order 6:30. Present: W. C. McDaniel, Mike Baldwin, Carol Lybanon, Matthew Lybanon, Bonnie

*Continued, P. 10*

# MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

MAGS Rockhound News ◊ A monthly newsletter for and by the members of MAGS

**March Board Minutes** Cooper, Bob  
*Continued from P. 9* Cooper, Dave  
Clarke, James  
Butchko, Nannett McDougal-Dykes,  
Melissa Koontz, Jane Coop.

**Old Business:** None.

**New Business:** 2021 MAGS Direc-  
tory updated and distributed. The  
2021 Show has been cancelled but if  
the Covid status changes we may have  
a smaller show later in the year. Check  
out the new Show website.

**Secretary:** Copies of the February  
minutes were distributed via email.  
Approved by the Board.

**Treasurer:** Club finance report ap-  
proved by the Board. Two checks  
written in February (SFMS 2021  
Membership Renewal and SFMS Li-  
ability Insurance—club only). Received  
moderate interest on one of our CDs.  
Balance reported to the Board.

**UPCOMING EXPENSES:** Bonnie  
will pay church rent for storage room  
for April by the end of March and

bills for our website & domain name  
once they are turned in.

**THINGS TO DO:** Club taxes to be  
filed. Follow up to receive partial re-  
fund of SFMS Show Insurance that  
we paid for in 2020 but didn't use due  
to cancellation of Show.

**Membership:** No new Members.  
March newsletter sent out.

**Field Trips:** Discussed several op-  
tions for local field trips beginning in  
March. Saturday March 20—Blue  
Springs. April—Melba Cole's place.  
May—Frankstown. W. C. suggested a  
tour of the Pink Palace and collection.

**Adult Programs:** Membership  
meeting on Zoom. Dave has estab-  
lished a link for the Zoom Board  
Meetings that can be used multiple  
times throughout the year. He will  
establish one for the Membership  
Meetings as well. Upcoming: March—  
Mike Baldwin, Zoom, Native Ameri-  
can Anthropology. April—Mike Gib-  
son, Zoom, Coon Creek. Dave will

contact Luke Ramsey from Pink  
Palace about a talk.

**Junior Programs:** On hold until  
further notice.

**Library:** No report

**Rock Swaps:** None planned.

**Editor:** February newsletter is out.  
Everything comes to Matthew by  
email so send him photos, reports, or  
stories.

**Web:** Web site updated for February/  
March.

Adjourned 7:15.

## March Meeting Minutes

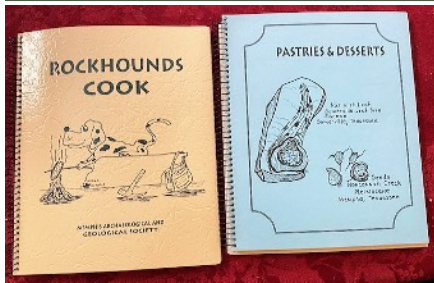
*Mike Coulson*

Zoom meeting. Mike Baldwin gave a  
presentation on Native American An-  
thropology. Upcoming event at the  
Pink Palace Museum: "Fossil Fest"  
Saturday March 27-28, 12-4. Contact  
W. C. if interested in volunteering at  
the MAGS table—(901) 490-3575. Ad-  
journed 8:20.

## April Meeting Pictures







**Mississippi Mud Cake**  
(Carol Lybanon)

**INGREDIENTS**

- any chocolate cake baked in a 9x13 in pan
- 10.5 oz mini marshmallows

**Frosting**

- 1/3 cup butter
- 1/3 cup milk
- 1/3 cup cocoa powder
- 1 tsp vanilla extract
- 3 cups powdered sugar

**INSTRUCTIONS**

Bake chocolate cake according to instructions. Remove cake from oven and sprinkle marshmallows all over the cake, completely covering it.

**Frosting**

1. Melt butter in a small saucepan over medium-high heat. Add milk and cocoa powder and whisk well. Cook for about 2-3 more minutes, stirring constantly, until mixture has thickened slightly. Remove from heat and stir in vanilla and powdered sugar. Use an electric mixer to make the frosting smooth.
2. Drizzle warm frosting immediately over cake. Refrigerate cake for for about 30 minutes or until frosting has set. Store at room temperature.

**Chicken Spectacular**  
(Stephanie Blandin)

**INGREDIENTS**

- 3 cups chicken (cooked & sliced)
- 1 pkg Uncle Ben's wild rice (cooked)
- 1 can cream of celery soup
- 1 medium jar pimento
- 1 medium chopped onion (cooked)
- 1 cup mayonnaise
- 1 cup diced water chestnuts

**INSTRUCTIONS**

Mix all ingredients in baking pan and bake at 350°F for 30 minutes to 1 hour AFTER topping is added.

**Topping**

- 1 pkg sliced almonds
- 1 1/2 cups cornflakes
- 1/2 cup melted butter

Mix well and spread over top of casserole.

**Armadillo Eggs**  
(Stephanie Blandin)

**INGREDIENTS**

- jalapeño peppers
- cheese (Jack, hot pepper)
- sausage (hot is good)
- Shake 'n Bake (hot and spicy is good)

**INSTRUCTIONS**

Slice peppers down won side and deseed. Stuff with cheese and wrap with sausage. Roll in Shake 'n Bake. Bake at 325°-350°F for 30-45 minutes.



*Enjoy this column? Share your recipes.*



**Meetings**

Zoom or "mixed" meetings.

*May 14:* Michael Gibson, "Coon Creek". See P. 1.

*June 11:* Julie Morrow, "Pleistocene megafauna fossils"

*July 9:* Paul Edson-Lahm, "Geology of the Portland Basin"

**Field Trips**

*May 15:* Blue Springs

*June 19:* Hot Springs (quartz mine)

*July:* TBD

**Rock Swaps**

May 29, 10:00 A. M.-2:00 P. M., Lou White residence

**May Birthdays**

- 2 Amber Dunn
- Aniyah Thomas
- 4 Sunny Finch
- 9 Carol Lybanon
- 10 Julie Lybanon
- 11 Theresa Childress
- Mary Elliott
- 12 Pam Crumpton
- Trace Hartman
- 13 James Butchko
- 16 Robert Duncan
- 17 Dave Kitkowski
- 20 Michele Robbins
- 23 Zoe Sams
- 25 Amber Shields
- 27 Kelly Brown
- 28 Colby Wrasse
- 30 Herb Nicholson

# MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

MAGS Rockhound News ♦ A monthly newsletter for and by the members of MAGS

## MAGS At A Glance May 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
25	26	27	28	29	30	1
2	3	4	5	6 Zoom Board Meeting, 6:30 pm	7	8
9 	10	11	12	13	14 Zoom Membership Meeting, Dr. Michael Gibson, "Coon Creek"	15 MAGS Field Trip, Blue Springs, Mesozoic & Cretaceous Fossils
16	17	18	19	20	21	22
23	24	25	26	27	28	29 MAGS Rock Swap, 10 am-2 pm, Lou White Residence
30	31 	1	2	3	4	5

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