



Volume 69 ♦ Number 03 ♦ March 2023 ♦ A monthly newsletter for and by the members of MAGS

Almost Like Magic

March Program

Alan Schaeffer, M.D.



It is always amazing to see mineral specimens light up with a UV (ultraviolet light) lamp! The transformation of a simple rock into an array of colors is like magic, but it is not. There are a number of minerals that fluoresce when exposed to UV energy UV

light is a wavelength of light between 120 and 400 nm. Ultraviolet energy has the potential to excite electrons in minerals causing a release of photons. In fact, it takes a specific wavelength of UV light to excite the mineral's electrons. For our purposes, long *Continued, P. 6*

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FOUND ON EBAY: FLUORESCENT SPECIMEN

This specimen caused me to have to do some research on both Mindat.org and elsewhere! First, my personal efforts. I spotted this piece on eBay at least three weeks ago, and wanted it badly as it displayed a texture which I was most interested in while in university; gosh over 50 years ago! Well, someone outbid me and I figured it was



MICHAEL HOWARD

gone as it had sold. Then a couple of days later I got an email from the seller saying it had been relisted if I was still interested. And the relisted price had dropped a bit, so I put in a bid for what my high bid was before, held my breath for four days, and won it!

About the specimen itself, it is a nearly half inch thick slab of coarse grained *Continued, P. 3*

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

MAGS Show Website: <https://earthwideopen.wixsite.com/rocks>



Please contribute articles or pictures on any subject of interest to rockhounds. The 20th of the month is the deadline for next month's issue. Send material to lybanon@earthlink.net.

Go to <https://www.southeastfed.org/sfms-field-trips/dmc-field-trip-program> for the DMC field trip schedule and other information.

Links to Federation News

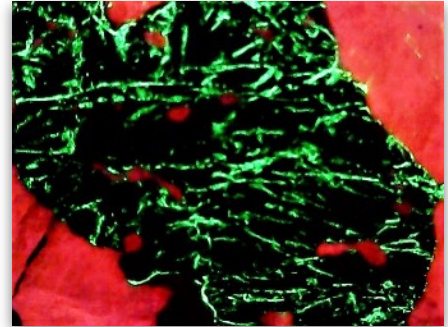
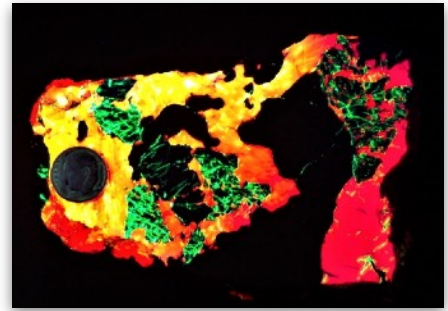
- ➔ AFMS: www.amfed.org/afms_news.htm
- ➔ SFMS: <https://www.southeastfed.org/>

*Found on eBay: Fluorescent Specimen
Continued from P. 1*

calcite, zincite, tephroite, and franklinite, from Franklin Mine, Sussex Co., New Jersey. I was excited to see it fluoresce because I am interested in the texture of the willemite in this specimen, which is mostly confined to the mineral tephroite.

KT refers you to the following article in *American Mineralogist*, V 70, pp. 568-575, 1983 by Carl A. Francis, New Data on the Forsterite-Tephroite Series. Tephroite is the Manganese end member within the Olivine Group. Francis worked on Tephroite from the well known zinc deposits of Sterling Hill and Franklin, New Jersey. He found that zinc-bearing olivines occur in the metamorphosed Zn-Mg-Fe deposits there. Individual crystals of the mineral tephroite contain oriented lamellae of willemite and he considered that strong evidence of exsolution origin for the willemite of that association. He also found that tephroite originally needed to contain ~20 vol. % Zn_2SiO_4 components for exsolution to occur.

Exsolution as defined is a process whereby an initially homogenous solid solution (a crystal separates into two or more distinct crystalline phases (minerals) without change to the bulk composition (chemistry). (Source: AGI, Mindat.org). No addition or deletion of material is necessary. It is a process whereby a mineral that formed at high temperatures will separate mechanically into two distinct minerals, even when it is a solid. Why does this happen? Because at high temperatures, the



lattice structure of the initial mineral is more open and can accommodate variously sized atoms and cations, but as the mineral cools, the structure collapses, and those cations and atoms that are now too large to stay in that structure, separate and form a different mineral. When you look at the overall chemistry, there is no change!

We see this most commonly in the Feldspar Group, particularly the plagioclases (perthites and antiperthites) and in microcline (as tartan patterns in said minerals), but it is also known to occur in high temperature ilmenite where the final two minerals are magnetite and hematite. Also, well known from the change of high temperature Leucite to a mixture of nepheline and k-feldspar. This is for me the first time I have seen it in tephroite as that mineral is pretty scarce worldwide. This specimen is from the type locality (TL) for tephroite.

Anyway, here are a series of

photographs, the first two with a US dime for size comparison. The gray matrix is calcite, the black opaque is franklinite (TL), the orangish red is zincite, and the brown blebs are tephroite (TL) in the first image. The second picture shows the specimens response to SW 245nm light...calcite varies from orange to yellowish, and willemite is green.

The second pair of images was taken at 10X with a USB Chinese LED "toy" microscope. The first picture is in natural light and shows a homogenous appearing coarse grain of tephroite set in calcite. But the second picture of this set shows linear streaks and sets of fluorescent green willemite within the same grain. Again the lamp is SW 245nm. The willemite is either as thin streaks or veinlets and as apparent fracture fillings within the tephroite grain. Very little of the willemite is within or cutting through the other minerals present...as revealed in the second image of the set. *Continued, P. 4*

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*Found on eBay: Fluorescent Specimen
Continued from P. 3*

Hope you find this info and specimen as interesting as I do!

President's Message

SHOW23

The 2023 edition of the Memphis Mineral Fossil Jewelry Show is approaching. We want Members to get ready and get involved.

Show features

- Over 300 tables (about ½ mile) packed with rocks, minerals, fossils, gems, jewelry, and beads.
- RockZone for kids with Rocks around the Clock, Fossil and Gem Dig, 901 Rocks.
- Displays and Demonstrations
- The Memphis Rock Food Table makes its annual appearance.
- Grab Bags.
- Hourly and Grand Door Prizes.

Schedule

Thursday, April 20

1. Table vendors move in—help needed late morning.
2. MAGS moves from storage shed—help needed late morning.

Friday, April 21

1. Vendors move in.
2. RockZone/exhibition area organized.
3. **Note: No Show dinner on Friday night.**

Saturday, April 22

1. Show opens to the public 9:00 am, closes at 6:00 pm.

2. Lots of volunteers are needed so be sure to sign up.

Sunday, April 23

1. Show opens to the public 10:00 am, closes at 5:00 pm.
2. Lots of volunteers are needed so be sure to sign up.
3. Show breakdown and clean; need lots of help.

Monday, April 24

1. Items back to the shed.

So, what and how can every MAGS Member help?

Promote the Show

1. Post it all social media.
2. Email your friends.
3. Distribute postcards/Show announcements.
4. Club Show Tickets
 - Provides MAGS Members the opportunity to promote the Show by distributing tickets to the general public. Ticket procedures:
 - Available for use by current MAGS Members. No exceptions.
 - Members must sign each ticket. One admission per ticket.
 - Ticket holder is admitted free to Show.
 - At the conclusion of the Show each Member must pay. Through June 1 the cost is **\$3.00** for each redeemed ticket. After June 1 you must pay **\$4.00** for each redeemed ticket.
 - You are not responsible for tickets that are not used.

Donations

1. Drinks and snacks. Please bring to the Show Each and

every day.

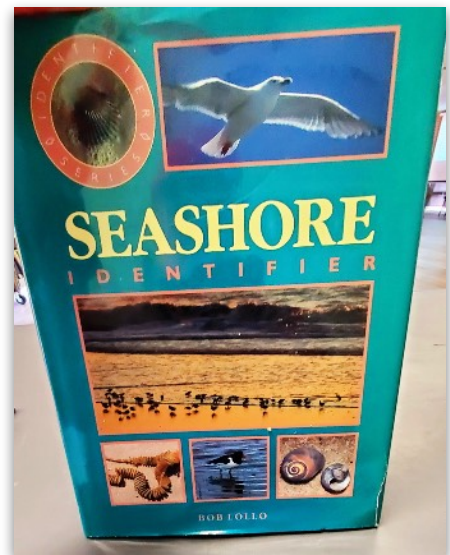
Volunteer

1. The Show depends on you helping by volunteering.
2. Volunteer schedule is available.

W. C.

New Book in the Library

Nannett McDougal-Dykes, Librarian



This book has lavish color photographs that show every aspect of the seashore, from rocky coves to mangrove swamps, and detailed line drawings illustrate a range of ideas.

There is an amazing chapter on Protected Areas and what you need to know and who to contact if you're taking a trip.

This is a great book. It will be in the Juniors section of the Library.

COMING SOON

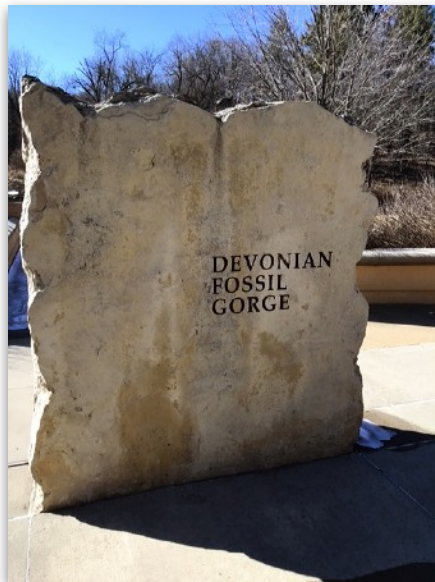
Memphis Mineral, Fossil, Jewelry Show, April 22 and 23.

Living In A Fossil Town

James Kee

When my wife and I moved to Coralville, Iowa, we had no idea the name was based on fossils. The “coral” refers to the abundant Devonian coral fossils found in the numerous limestone outcrops in and around the city. In fact, we even have a special park where people can observe fossil-bearing rocks and read informative plaques about them.

It’s called “Devonian Fossil Gorge.”



In a very real sense, the gorge was born in a catastrophe. In 1993, record rainfall caused Coralville Lake, a flood control reservoir, to overflow. The excess water went over an emergency spillway and gouged the land down to the bedrock. The exposed area revealed numerous Middle Devonian fossils—crinoids, mollusks, brachiopods, sponges, bryozoans, and—of course—a rich variety of corals. Iowa, and much of the Midwest, was at that time covered by a tropical ocean. The age is es-

timated to be 375 million years.

A subsequent flood in 2008 exposed even more fossil-bearing limestone.

This is one of the explanatory signs at the site.



The gorge, and the dam’s emergency spillway, can be seen in the next picture.

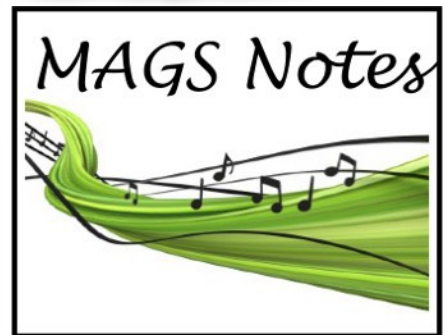


Two people in the picture were pounding away with geology picks, which is a definite no-no. However, it is perfectly fine to hunt for specimens in the abundant gravel beds which extend downstream for many miles! Here are some of my stream gravel find-

ings.



If your travels ever take you to Iowa, the Devonian Fossil Gorge should be on your list of places to see!



Adult Programs

The March meeting will be on Friday night, so that there can be darkness for better viewing of fluorescent minerals. The April meeting will be on Saturday morning. In May we return to Friday night meetings.

Do you have program ideas? Email Program Chair Christine McManus with your suggestions or requests.

March 10: Alan Schaeffer, M.D., “Fluorescent Minerals.”

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Get Ready!



It is almost time to sign up for our Show in April. This year's dates are Saturday, April 22, and Sunday, April 23. We are using SignUpGenius again. In the next couple of weeks, you will get an email from SignUpGenius, asking you to sign up to help. The slots are two hours each and we ask that you sign up for multiple slots. We need help at the front desk, RockZone (kids area), setup, breakdown, and cleanup.

Looking forward to hearing from you all. We need your support to have another successful show. If you need additional information, call or email Carol Lybanon.

The Magic Of UV wave is 320-400 nm, short wave 280-320 nm, and midwave in the 310-330 range. Minerals that fluoresce with long wave UV light include fluorite, wernerite, rubies, and sodalite. Minerals that fluoresce with short wave UV light include aragonite, calcite, and willemite. With energy, an electron can be excited to a higher energy or orbital level. When the electron returns to its normal orbital energy is released. This can be either heat or in this case, photon energy. The wavelength of the released photons determines the color of the fluorescence. For instance, rubies emit photons in the red spectrum while sodalite is orange and wernerite is yellow.

What makes a mineral fluorescent? In many cases there are "impurities" or activators in the

mineral which donate electrons to be stimulated and allow the mineral to fluoresce. In the case of fluorite, CaF_2 , europium replaces some of the calcium atoms. In Terlingua calcite, CaCO_3 , there are two impurities allowing the calcite to fluoresce pink with long wave and blue with short wave.

There are also medical uses for

UV light. In high school, I used forms of tetracycline to measure rat bone growth. The tetracycline fluoresced in the bones and allowed me to measure the growth. UV light is used to neutralize microorganisms in hospitals. LASIK eye surgery uses a UV laser to reshape the cornea. Another use of UV light is for collagen cross-linking. In this case, UV light activates riboflavin (vitamin B2) electrons allowing some of the electrons to escape. These free electrons interact with oxygen (O_2) molecules causing them to dissociate into O^- free radicals. The oxygen free radical can then bind to the corneal collagen and strengthen the cornea.

While the magic of fluorescence is fun to visualize, the science behind glowing rocks is fascinating and applications in medicine are growing.



Fabulous Tennessee Fossils

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

FTF 97

Favorite Fossils Books from Our Youth



I have written in the FTF more than once about how serendipity always catches my attention and influences what I decide to write about. While I was preparing to introduce you to another Tennessee paleontologist (Professor Emeritus Leonard Alberstadt from Vanderbilt University—that will happen next month), I was struck no less than six times by references to a couple of books that were near and dear to me growing up and I am betting they were to you as well. As I was researching several people or reading other items involving paleontologists I know, each person specifically drew attention to these books as being highly influential to their budding careers. The first book I will discuss was my very first fossil book, *A Golden Nature Guide* series book entitled *Fossils: A Guide to Prehistoric Life*, by Frank H.T. Rhodes, Herbert S. Zim, and Paul R. Shaffer, illustrated by Raymond Perlman. My copy was the 1962 1st edition printing (Figure 1), which I still have along with the 1964 3rd printing and the 2001 printing. My fossil collecting began when I was a tender age of six years old when I found fossil shells while playing in a ditch on the back of our Williamsburg, Virginia, property. That Fall when I had started first grade at Matthew Whaley Elementary school, my teacher Mrs. Lindsey put on display a large collection of modern seashells for us to see and touch. I

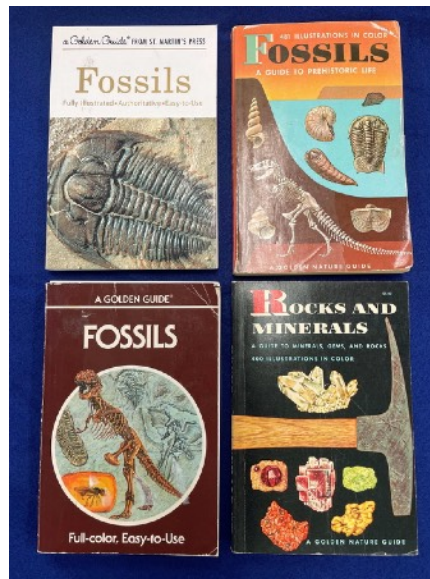


Figure 1. Three editions of the Golden Nature Guide *Fossils: A Guide to Prehistoric Life and Rocks and Minerals* from the author's library. 2001 Edition (upper left), 1964 Third Edition (upper right), 1962 First Edition (lower left), and 1957 First Edition of *Rocks and Minerals* (lower right).

immediately recognized some of my fossils among these modern shells, only these had color. Of course, I didn't know that my shells were fossils at this point and were Pliocene in age (7-10 million years old), but I did understand that my house was once the ocean. I had fallen in love with digging and finding things in the ground, but seeing that labeled and organized collection of shells turned me into a collector (some would say "fossil-hoarder"). My parents always supported anything involving learning, so the 1962 edition of

the *Fossils* book was one of my Christmas gifts that year, along with my first digging tools.

Golden Press *Fossils* is still in print and is part of a series of nearly two dozen books devoted to nature and aimed at young audiences. They have changed little since their inception in 1949 (I refer you to Wikipedia's website for a full history of the Golden Press line of books—https://en.wikipedia.org/wiki/Golden_Guide). Each book is 160 pages long exactly and begins with an overview of the basics to the science being highlighted in the book. Illustrations are beautiful and in watercolor. I still use many of them in my paleontology courses, partly for nostalgia, but partly because they are just that good (their labeled color trilobite on page 64 is my favorite). Illustrator Raymond Perlman (1923-2015) painted the fossils in watercolor. He also did illustrator work for the *Childcraft* encyclopedia set from the 1960s (another favorite of mine). Many of the panoramas of prehistorical seascapes or landscapes were modified from classic artists like Charles Knight. While no specific fossil or fossil site in Tennessee is listed in the guides, many of the fossils that the guides focus on are common Tennessee fossils that I have featured in past FTF, such as the sponge *Astraeospongia*; brachiopods *Dinorthis*, *Platystrophia*, *Atry-*

Continued, P. 8

Fabulous Tennessee Fossils *pa*, and *Continued from P. 7* *Letpaena*; the trilobite *Dalmanites*; the gastropod *Maclurites*; and the bivalve *Exogyra* (although their images of *Exogyra* does not resemble our Cretaceous specimens). I know I read my *Fossils* books over and over, dozens if not hundreds of times when I was very young. Most of the pages are now coming loose from the glue binding. Although I outgrew these books aimed at the young, I kept them as old friends. I was just at MAGster Ron Brister's "man-cave" and admired his collection of Golden Nature guides; at least 20 different guides.

The second book that seems to be a common thread in the early career interest of many paleontologists and amateurs is *The Fossil Book: A Record of Prehistoric Life* by Carrol L. and Mildred A. Fenton, published in 1958. I did not get my copy of this one until the early 1970s when I was in middle school (but I constantly checked this book out of the Williamsburg Public Library). This 482-page tome was my "go-to" book for real information on fossils. *The Fossil Book* was my primary resource for my first fossil-related school project while I was taking Earth science in 9th grade under Mrs. Garrington, which is when I talked my mother into buying me that book. *The Fossil Book* is not written as an identification guide, but rather it is more of a layman's textbook to fossils and their meaning. It is part of an extensive array of books by the husband-and-wife team that are related to Earth science and the history of geology, all of which are partially

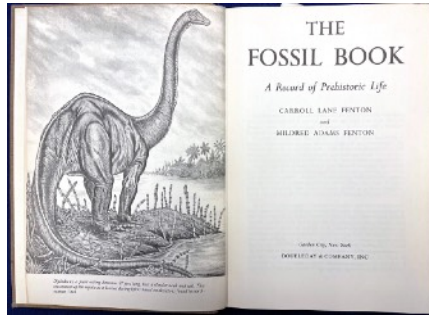


Figure 2. Author's copy of the frontispiece pages from the First Edition of *The Fossil Book*, by Carroll and Mildred Fenton, published in 1958.

aimed at the public.

Carroll Fenton (1900-1969) was a New Jersey-born paleontologist who earned his PhD from the University of Iowa, along with his wife Mildred Adams Fenton (1899-1995) who also received her PhD from University of Iowa. They met in college at the University of Illinois and both had a keen interest in paleontology, as well as the history of geology (they wrote one of the classic books on the history of geology), and were well-known for writing popularized books about paleontology. *The Fossil Book* underwent a revision in 1989, after Carroll Fenton had passed. For the updated edition, Mildred Fenton relied on another family writing team, Patricia V. Rich and Thomas H. Rich, to update and expand the text. The illustrations largely remained the same. As with the Golden Press *Fossils*, the illustrations in *The Fossil Book* are so good that I still use many of them in my lecture presentations for paleontology. This book is still in print and very popular with libraries.

The Fossil Book does illustrate

many fossils from specifically named places, including Tennessee. Notable Tennessee fossil illustrations or photographs in the 1st edition of the book include: the sponges *Astylospongia praemorsa* (p. 65) and *Astraeospongia meniscus* (p. 64); the rugosan coral *Breviphyllyllum cliftonense* (p. 76); the brachiopods *Rhynchotretra americana*, *Triplesia ortonii*, *Plethorhynchba speciosa*, *Zygospira modesta*, *Elytha fimbriata*, and *Homeospira evax*; the crinoids *Troostocrinus reinwardti*, *Lampterocrinus tennesseensis*, *Sagenocrinus clarki*; the gastropod *Busycon cretaceum* Wade (from our Coon Creek Formation); and the cephalopod *Actinoceras glenni*. While the above list has those illustrated species based upon a Tennessee specimen in collection, a significant portion of the other illustrations in the book are Tennessee taxa, but listed as being from a region larger than Tennessee (e.g., Mississippi Valley, etc.). No vertebrates, plants, or trace fossils were listed specifically from Tennessee.

In addition to the individual fossil illustrations, the Fentons included dioramas in the book, two of which were based upon Tennessee fossils sites. On page 175 of the first edition, they include a line-drawing diorama illustrating the Cretaceous seafloor with the oysters *Exogyra costata* and *Gryphaea mutabilis* "shown as they lived on the sea bottom in what is now McNairy County (p. 175)." They used the Coon Creek type locality as the basis for this illustration. The second illustration is a color plate of the Cretaceous seafloor. It is a photograph of a *Continued, P. 9*

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Fabulous Tennessee Fossils three-dimensional reconstruction diorama with models of snails, clams, ammonoids, and plants as they lived on the sea floor. This diorama looks very much like the “Life in the Cretaceous Seas” diorama in the American Museum of Natural History, which is based upon the McNairy Coon Creek site, however, the book illustration is not a perfect match. Although the acknowledgements of the book indicate that most illustrations were from the Smithsonian, this one does not match any of the current dioramas on display at the Smithsonian either. I searched for this seafloor diorama on the Internet, but so far, I have not found any images that match the display depicted in *The Fossil Book*. I suspect that this particular seafloor diorama was redesigned during a museum upgrade at some point, possibly the Smithsonian’s Natural History Museum. I also believe that the original diorama was probably based upon the Coon Creek site. Also, it is possible that this photograph is an earlier version of the AMNH diorama.

These two books played a significant role in the lives and careers of many amateur and professional paleontologists since their publications in the late 1950s and early 1960s. Like the fossils we find, they have stood the test of time and beautiful connections to the past. Although I have read both many times, especially before I went to college, they continue to educate me and to bring me pleasure. Books from our past are all old friends that offer memories and comfort. As C.S. Lewis said, “No book is really worth reading at the age of ten which is not equally—and often far more—worth reading at the age of fifty and beyond.”

MAGS Notes April 15: Dr. Ryan Parish, “Archaeological Treasures of Nonconnah Creek.”

May 12: Carol & Matthew Lybanon, “Shark Teeth & Other Fossil Hunting in Florida.”

Junior Programs

March-May: TBD.

Field Trips

March 18: Crow Creek, Forrest

City, AR
April & May: TBD

March Birthdays

- 5 Walter Davis
- 8 Stacy Cowell
- 10 Vyte Jonkus
- Eric Leppanner
- 13 Anneliese Conner
- 20 Stevie Kennedy
- 22 Ruth Barnes
- 31 Hunter Hill

New Members

Gus & Racheal Mitchell, son Dominic, niece Aniyah Thomas (former Members, welcome back)

Memphis Mineral, Fossil and Jewelry Show 2023
THE EARTH WIDE OPEN Sat. April 22, 9-6 | Sun. April 23, 10-5
 Rocks, Fossils, Minerals, Gems, Lapidary Equipment, Jewelry and Beads
 AgCenter International
 7777 Walnut Grove Rd., Memphis, TN
 Presented by the Memphis Archaeological and Geological Society
 Adults - \$6, 2 day pass - \$8 | 12 & under - \$2 | Scouts in Uniform - Free
<https://earthwideopen.wixsite.com/rocks> 901-921-3096 / 901-490-3575

February Meeting

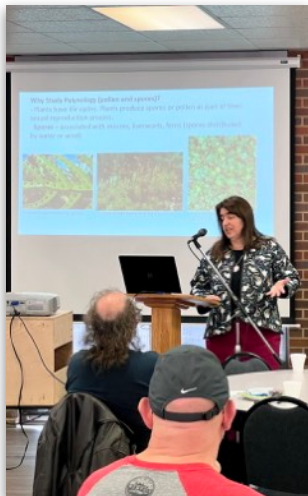
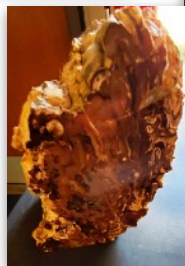


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Christine McManus
Nannett McDougal-Dykes



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MAGS At A Glance

March 2023

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
26	27	28	1	2 Zoom Board Meeting, 6:30 pm	3	4
5	6	7	8	9	10 Membership Meeting, 7:00 pm, "Fluorescent Minerals"	11
12 	13	14	15	16	17 	18 MAGS Field Trip, Crow Creek, Forrest City, AR
19 DMC Field Trip, Mid-Georgia Gem and Mineral Society	20 	21	22	23	24	25
26	27	28	29	30	31	1

Memphis Archaeological and Geological Society
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 Memphis, TN 38016

