Bones, Then and Now

Text and Photo by Jane Coop

February Adult Program

Who were the first humans to recognize the existence of dinosaurs and how do we know?

What were the Bone Wars of the mid-1800s and whose side would you be on?

What was missing from Darwin’s evolutionary theory that dinosaurs helped prove?

Get the answers to these questions and more during the February program next Membership Meeting where you learn about the early paleontologists—the curious, the eccentric, and the obsessed.

February’s program will be a short history of man’s important dinosaur discoveries with emphasis on the adventurous aspects of finding dinosaur bones. Early bone hunters had the U.S. Cavalry.

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HOW ARE MOUNTAINS FORMED?

Mike Baldwin

February Youth Program

Mike Baldwin

February Youth Program

During the February Mags Youth meeting, we will be talking about geological processes like folding, faulting and volcanoes. Mountains are some of the most remarkable geologic features on earth. They tend to define the regions in which they are located. Earth’s tectonic plates are continually moving. As two plates move against each other, the crust is deformed, resulting in the formation of mountains.

We will be looking at four types of mountains:
1. Fold Mountains such as The Rockies.
2. Volcanic Mountains such as Mona Loa and Mona Kea in Hawaii.
3. Block Mountains such as the

Continued, P. 4.
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: www.theearthwideopen.com

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.

February DMC Field Trip

WHERE: Stoney Bluff, Girard, GA
WHEN: Saturday, February 16, 9:00 A.M.
COLLECTING: Savannah River Agate
INFORMATION: Jim Maudsley, (706) 353-1792 or jamesm24@charter.net

Links to Federation News

> AFMS: www.amfed.org/afms_news.htm
> SFMS: www.amfed.org/sfms/
> DMC: www.amfed.org/sfms/_dmc/dmc.htm
escort them to dig sites because of outlaws and bandits. Learn about the challenges of transporting tons of fragile bone by horse, wagon, train, and boat.

The escorts are no longer needed. Dig sites are simply hot, gritty, and infested with cacti, snakes, and scorpions. When you see a bone being field-prepped for transport, you’ll see why it is worth it.

To become a MAGS Member, just go to our website at www.memphisgeology.org and print out an application form. There is a prorated fee schedule for new Members only. Mail the completed application along with the dues payment to the Membership Director shown on the form. If you are unable to print the application, you can pick one up at the sign-in desk at any of our Friday night Membership Meetings, or simply join at the meeting. Visitors are always welcome at our Membership Meetings but membership is required to attend our field trips.

The most important benefit of being a MAGS Member is getting to know and make friends with other members who have similar interest in rocks, minerals, fossils, and archaeology. All new Members will receive a New Member Packet, a MAGS ID card, and a monthly newsletter via email.

Members are entitled to go on our monthly field trips and get free admission to our annual rock and mineral show.

**2019 Show Grand Door Prize**

**2019 Show Update**

- Dealer space is sold out.
- The SignUpGenius will premier in February so get ready to volunteer.
- We are in need of material for the Rockzone and Grab Bags, so start bringing that material to donate.
- If you run across some good buys of nonperishable, still good at show time items for the hospitality and dealer bags please pick them up and save for later date.
- Help advertise and market the Show. We will have a new community focus marketing program.

**Adult Programs**

*February*: Jane Coop, “Bones, Then and Now”

*March*: Mike Howard, “Crater of Diamonds”

*April*: “2019 Show Preview”

**Junior Programs**

*February*: Mike Baldwin, “Mountaint Building and Contour Map Reading”

*March*: Jane Coop, “What Are Fossils and How Do They Form?”

*April*: “2019 Show Preview” with the adults.

**New Members**

Elsie and Jason Bolton
Kelly and Jeremy Bowen
Rosie Crawford
Jennifer and Adam Featherston
Sendi Palmer
Elmer and Mary Katherine Stout

**Want to Be a Member?**

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**February Birthdays**

- 2 Peggy Davis
- 3 Bill Price
- 4 Anne Pinkerton
- 9 Vincent Mayer
- 12 Louis White
- 13 Emrys Carnahan
- 17 Gary Sherman
- 19 David Vaughn
- 20 Kim Hill
- 21 Bella Hill
- 26 Harrison Parks
- 27 Leigh Scott
How Are Mountains Formed?
Continued from P. 1

4. Plateau Mountains such as the Catskills.

The youth will be conducting mountain building experiments during the meeting.

SFMS Federation Week
William Holland
June 9th, 2019–June 14th, 2019

A brief list of the workshops follows. For more information go to [www.sfmsworkshops.org](http://www.sfmsworkshops.org).

✓ Casting with Bill Harr
✓ Loop 'n Loop with Chuck Bruce
✓ Silver II–Fused with Dale Koebnick
✓ Metal Manipulation/Cold Connections with Debora Mauser
✓ Wire II–Bracelets Only with Gene Sheridan
✓ Silver Wear I and II with Jan and Keith Stephens
✓ Electro Etching/Wood Inlay with Micah Kirby
✓ Silver I with Vickie Prillaman
✓ Cabochons I with Paul Roberts
✓ Opals II–Carving with Cheryl Kasper
✓ Beading with Dot Kasper

The historic Fossil Cabin on U. S. Route 30/287 about five miles east of Medicine Bow, Carbon County, Wyoming, was built in 1932 as a roadside attraction on the Lincoln Highway. The cabin was built as part of a filling station by Thomas Boylan. It is listed in the National Register of Historic Places for being unique and for being directly related to the nation's first transcontinental highway. The cabin is widely recognized as the only building constructed of fossilized dinosaur bones in the United States, according to Nancy Weidel, author of the document nominating the site for the National Register of Historic Places.

Thomas Boylan was born in Humboldt County, California, in 1863. He arrived in Wyoming in 1892, working for sheep ranching operations until 1904, when he switched to cattle. Boylan filed for a homestead near Como Bluff in 1908, where extensive deposits of fossilized dinosaur bones had been discovered in the 1870s.

Boylan died in 1947. Grace continued to operate the gas station until the 1960s, when the construction of I-80 caused a fall off in traffic on Route 30. Grace sold the property in 1974. The cabin has since been offered for sale. One potential buyer has proposed moving the cabin to North Carolina for display.

References:
• Roberts, Phil. "The Builder of the 'World's Oldest Cabin,'" accessed 1/3/12 at [http://uwacadweb.buwyo.edu/roberts/history/worlds_oldest_cabin_fossil.htm](http://uwacadweb.buwyo.edu/roberts/history/worlds_oldest_cabin_fossil.htm)

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MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY
MAGS Rockhound News ◇ A monthly newsletter for and by the members of MAGS

FEBRUARY 2019 PAGE 5

It’s About Time
Matthew Lybanon

Geologists look into the “deep time” of Earth’s early history (billions of years), just as astronomers look into the “deep space” of the outer universe (billions of light years). The geologic time scale organizes “deep time.”

Articles in two recent issues gave a brief description of the geologic time scale and a mnemonic to help you remember all those names. An overview follows.

The geologic time scale divides Earth’s history into intervals marked by distinct sets of fossils, and it places the boundaries of those intervals at times when those sets of fossils changed abruptly. The basic divisions are eras: the Paleozoic, the Mesozoic, and the Cenozoic.

The eras are subdivided into periods, usually named for the locality in which the formations representing them were first or best described, or for some distinguishing characteristic of the formations. The Paleogene and Neogene periods of the Cenozoic are exceptions; these Greek names mean “old origin” and “new origin,” respectively.

Some periods are further subdivided into epochs, such as the Miocene, Pliocene, and Pleistocene epochs of the Neogene period. We live in the Holocene (“completely new”) epoch of the Neogene period in the Cenozoic era.

Many of the major boundaries in the geologic time scale represent mass extinctions: short intervals during which a large proportion of the species simply disappeared from the fossil record, followed by the blossoming of many new species. These abrupt changes in faunal successions (the principle of faunal succession states that the sedimentary strata in an outcrop contain fossils in a definite sequence) were a great mystery to the geologists who discovered them.

Darwin’s theory of evolution explained how new species could evolve, but what had caused the mass extinctions? In some cases mass extinctions can be tied to catastrophic events (a large meteorite impact, for example). In other cases we’re still not sure.

There is a related problem. Perhaps the most remarkable geological event in Earth’s history, aside from the origin of life itself, was the sudden appearance of large animals with shells and skeletons at the end of Precambrian time (the Cambrian period is the first in the Paleozoic era).

This rapid development of new types of organisms from a common ancestor—what biologists call an evolutionary radiation—had such an extraordinary effect on the fossil record that its culmination 542 million years ago is used to mark the most profound boundary of the geologic time scale: the beginning of the Phanerozoic con.

(Yet another of those words: eon. What’s an eon? More below.)

This boundary also coincides with the start of the Paleozoic era and the Cambrian period. The radiation of animals during the early Cambrian, after almost a billion years of very slow evolution, was so fast that it is often called the Cambrian explosion. Every major animal group that exists on Earth today, as well as a few more that have since become extinct, appeared within less than 10 million years.

Back in the days of Charles Darwin, it wasn’t

Congratualtions to Alan Parks for winning the early membership renewal prize, Agates of Lake Superior, written by Bob and Dan R. Lynch.

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Fossil Cabin
Continued from P. 4


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*Continued, P. 6*
Imagine compressing the 4.56 billion years of Earth history into a single year, starting with the formation of Earth on January 1 and ending at midnight on December 31. Within the first week, Earth was organized into core, mantle, and crust. The oldest zircon grain from the Jack Hills [the Australian site where the oldest known mineral grain yet discovered in Earth’s crust was found] crystallized on January 13. The first primitive organisms appeared in mid-March. By mid-June, stable continents had developed, and throughout the summer and early fall, the biological activity of evolving life increased the concentration of oxygen in the atmosphere. On November 18, at the beginning of the Cambrian period, complex organisms, including those with shells, appeared. On December 11, reptiles evolved, and late on Christmas Day, the dinosaurs became extinct.

Modern humans, *Homo sapiens*, did not appear on the scene until 11:42 P.M. on New Year’s Eve, and the most recent ice age did not end until 11:58 P.M. Three and a half seconds before midnight, Columbus landed on a West Indian island, and a couple of tenths of a second ago, you were born!


**Jewelry Bench Tips by Brad Smith**

**PROTECTING FINISHED SURFACES**

I figure that any accidental scratch I make on a piece means about 15 minutes of extra sanding and polishing. So after finishing major surfaces I typically cover them with some masking tape to avoid any scratches when doing final work like cleanups and setting of stones. The blue masking tape...
When we think of a fossil, we are usually thinking of shell, bone, wood, leaves, teeth, or some other “hard part” of an organism that lived, died, was buried, and with luck, endured various types of preservation processes to become fossilized. The definition of fossil is actually a little broader than the actual remains of an organism; it includes molecular fossils (kerogen, oil, blood, DNA, urine, etc.) and a category of fossils paleontologists call “trace fossils”. Trace fossils are the tracks, trails, footprints, bite marks, scratch marks, drill holes, etc. made by ancient organisms. They represent behaviors of organisms. Skeletal features do not have to be present to classify a fossil as a trace fossil. The German word for traces made by organisms is “lebensspuren” (from the German for “live tracks”); German paleontologists were pioneers in the study of trace making. The branch of paleontology that focuses upon traces is called ichnology (from the Greek “ichnion” meaning “tracker”), which includes the study of modern traces (neoichnology) and ancient traces (paleoichnology). When discussing classification of a group of organisms, biologists use the term “taxon” to represent a formalized group. Likewise, an ancient group can be referred to as a “paleotaxon” and traces can be called “ichnotaxa”; both “ichnogenera” and “ichnospecies” exist. There are three important things to always remember about ichno-taxa. First, often, we may never know the actual identity of the organism that makes a trace. They remain useful, though, because they do represent behaviors and response to environmental characteristics, even if we do not know the identity of the trace-maker. That is why specimens that still have the trace-maker associated with the trace are very important discoveries. Secondly, sometimes the same trace can be made by more than one organism. Thirdly, most organisms are capable of making many different types of traces. Both of the above explain why it is good to have a separate naming system for traces. In this FTF, I want to focus on the invertebrate genus Cliona and its trace fossil counterpart Entobia.

Cliona is a genus of sponge in the Phylum Porifera that is very common in modern oceans, but it has an unusual life habit for what we normally think of as a marine sponge. Most marine sponges we picture occur on reefs and are cup-shaped baskets or sheets with large holes for current exchange (ostia and osculum). The type species for this genus is the modern yellow encrusting sponge Cliona celata. The geologic range of the genus Cliona is from Late Mississippian to the modern. Living Cliona occur in two habits, large, encrusting, massive masses and as a cryptic borer into calcareous substrates (mostly other shells made of calcite, but also limestone rock); the later growth form is commonly found in both fossilized and living shells along the Atlantic and Gulf coasts. It is this latter form that is of interest to us at this time. Living Cliona celata that bore are nearly hidden from the surface as the main body of the sponge is inside the substrate. Often the only indication the sponge is present in a living shell are tiny (< 1mm) yellow bumps extending a very short distance above the shell substrate. These are “ostia and oscula” and are the incumbent and excurrent openings respectively for the sponge, which is a filter feeder. In fossilized shells, the soft sponge tissue is long gone, but the shell will show a patch of tiny pinholes. As the excavations of Cliona weaken the shell substrate, fossilized shells with Cliona are often broken and in worse shape than most of the shells that were not infested by...
Cliona. Since many collectors look for very well-preserved specimens, these more corroded specimens are overlooked as "defective", when in fact they are preserving traces of an entire different, and hidden, organism AND a behavioral interaction between the two organisms. *Cliona* can infest the shell of a living organism, like a clam, which would make it a symbiont, or it can infest shells of dead organisms, in which the association is postmortem and not interactive. At this point, another term that needs introducing is "sclerobiont" for any organism that attaches to or bores into another skeletal substrate, with no implications about the relationships between organisms implied (e.g., parasite, commensal, etc.). This is a fairly new scientific term that has become common in research in the last 20 years.

Now I am going to complicate these concepts a bit, so read carefully. So far we have been discussing the sponge genus *Cliona* ... the organism itself. But the tiny holes that *Cliona* excavates are not the organism itself, rather it is a result of destructive boring behavior (careful how you read that as you can change the meaning to be “a boring topic”, ha!) made by clionid sponges (Figure 1A). Do we use the same name, *Cliona*, for both the sponge and its bored galleries of traces? Well, yes; and no. A search of the literature will reveal that the holes are indeed very often given Linnaean binomial names and referred to as *Cliona*; and the holes are even given species names such as *Cliona cretacea* (we find this one in our famous Coon Creek Formation; Figure 1A). But, technically this is incorrect usage (although convenient for the researcher focusing on biodiversity [who was there] over paleoecology). The gallery of holes is the trace, not the organism itself, and the trace has its own genus name, *Entobia*, coined in 1970 by paleontologist Richard Bromley (a paleoichnologist). So our Coon Creek specimens are best called *Entobia cretacea* Portlock, 1843. The genus refers to the genus of traces borings, the species relates this particular trace to the species of sponge that made it, and the person’s name and date referring to who named the sponge species and when. Sometimes the species name for a trace does not match the species or organisms who made it, rather is chosen for some other feature of the trace that makes it distinct.

Can the shape of the original sponge be preserved? Yes. If we infill the gallery made by a boring *Cliona* with sediment (usually mud) that hardens and then erode or dissolve away the shell, we are left with a cast of the *Cliona* sponge (Figure 1B).

So, next time you find a somewhat ratty-looking shell (fossil or on a modern beach) full of small pin-head sized holes, think of it as a “threefer”: the host sclerobiont, its fossilized sponge neighbor, and a possible trace fossil representing the behavioral relationship between them. Also, one last tidbit of knowledge – *Cliona* etches the...
holes into its host shell by using a weak acid. As it etches the holes, very tiny silt-sized particles of carbonate are removed from the shell to become part of the surrounding sediment of the seafloor itself. Yep, Cliona is what we call a “sediment-producer”. Look at that! A “fourfer”!

Jewelry Bench Tips used by painters
Continued from P.6 works particularly well because it doesn’t leave a sticky residue.

PICKLE PRECAUTIONS

A hot pickle pot gives off fumes that bother me in my home workshop. I get around that by using my pickle cold. I mix it a little stronger than for a hot pot so that it works almost as quickly. I keep it in a large-mouth plastic bottle and cap it off whenever I’m done using it.

Be More Productive With Brad’s "How To Do It" Books

amazon.com/author/bradfordsmith

February’s Field Trip

Kim Hill

We will meet on February 16, 10 o’clock, at the Millington Walmart parking lot next to the Popeyes, and will convoy to the site. There will be directions and a signup sheet at the February Membership Meeting.

For the February 16 field trip we will have two choices in case one doesn’t work. The planned trip is to Richardson’s Landing, but Richardson’s always comes with a question. That question is … How high is the river?

Right now the answer is … very high. So in case the Mississippi doesn’t cooperate we have our second choice: Sugar Creek. The creek is just down the road from Richardson’s. Generally, even when the river is high, Sugar Creek is usually low enough to hunt. I will be watching the water levels before the trip.

Both places can be a treasure trove of finds. You can find agates, corals, Lake Superior agates, even ice age fossils and awesome pieces of driftwood at Richardson’s. Pretty much the same at Sugar Creek, which also has some great petrified wood.

Shhhhh ... I am also told there might be outlaw treasure buried out there somewhere.

For Richardson’s comfortable shoes or boots are a must (there is a lot of walking to reach the gravel beds), buckets or backpack to carry your finds, water, snacks. There are no facilities at either place.

If we go to Sugar Creek there is a fee. I will need to check what it is now. You will definitely need boots to help cross the creek to get to the gravel beds. It will be surface collecting at both sites, and please, no digging in the banks of the creek.

Hope to see you there. Happy collecting.

Just 85 days to the Show! We need volunteers. Look for an email from SignUpGenius and sign up.
December Board Minutes

*Mike Baldwin*

Called to order 6:30. Present: Charles Hill, Mike Baldwin, Kim Hill, Matthew Lybanon, Carol Lybanon, Bonnie Cooper, Bob Cooper, James Butchko, Nannett McDougal-Dykes, Mike Coulson, Jane Coop.

**Secretary:** Mike Baldwin: Electronic copies of the November minutes distributed to Board Members earlier this week, hard copies distributed this evening. Minutes approved with no changes. Hard copies of newsletter will be printed and mailed on Monday.

**Web:** The home page, calendar, and newsletter pages have been updated.

**Treasurer:** Bonnie passed the current checking summary around for review. Next month the rent and domain registration fee will be paid. Bonnie will take responsibility to print and mail the USPS newsletter.

**Membership:** We’ve had a small number of renewals and one request for membership information this month. The drawing will be held at the end of the January meeting. Charles suggested that we schedule the Sugar Creek for December.

**Field Trips:** The Pickwick trip went very well, with a good crowd. Everyone found good specimens. James suggested that we schedule Sugar Creek for December.

**Show:** Waiting on 5-6 dealers to register. James will follow up in January. The Coopers may not be able to attend the show so we might not have their dinosaur display. James asked for suggestions. A MAGS display area was suggested. We need grab bag material.

**Adult Programs:** No report.

**Library:** About 45 books are still delinquent. Nannett noted the policy which states that only MAGS Members can check out books. The Board discussed establishing rules of library usage, including issuing library cards. Mike will print library cards before next Friday’s night’s meeting, and memorial labels for donated books.

**Newsletter:** Send articles. December 15 deadline for the January newsletter.

**Historian:** Carol Lybanon will transition to Jane Coop.

**Youth Programs:** All the 2019 monthly programs for the youth have been determined,
December Board Minutes
Continued from P. 10

but can shift some programs to
2020 if someone else would like to
present. Here’s the list for next year.
January 11: “The Colors of Mars” with
Mike Baldwin. February 8: “Mountain
Building and Contour Map Reading”
with Mike Baldwin. March 8: “The
Last Ice Age” with Mike Baldwin.
April 12: “Show Preparations” with
the adults. May 10: “Earth’s Treasures”
with Jane Coop. June 14: “Viewing
Micro-Minerals with a Binocular Mi-
croscope” with Mike Baldwin. July 12:
“Caves: How They Form and What’s
Inside Them” with Mike Baldwin.
August 9: “Indoor Picnic and Rock
Swap” with the adults. September 13:
“Native American Lore and Artifacts”
with Kim Hill. October 11: “Inside
Geology” with W. C. McDaniel. No-
Vember 8: “Native Americans: Who
Are They and Where Did They Come
From” with Mike Baldwin. November
13: “Holiday Party” with the adults.
Mike needs to work on the specimen-
of-the-month. He has Tennessee
agate for January. California white
howlite for February, and Utah
snowflake obsidian for March. He
hopes to find enough Douglas Lake
Diamonds in January to give each
youth that attends the April meeting.
Mike plans to purchase specimen cas-
es for the January meeting.
The Board discussed Holiday Party
plans; planning for at least 150 peo-
ple. The DMC Field Trip for January
2019 will be to Davidson Lake (30
miles east of Knoxville) to surface
collect Davidson Lake Diamonds,
which are similar to Herkimer Dia-
monds. Mike hopes to plan a “youth
and youth families only” visit to
Cumberland Caverns or Mammoth
Cave during July. He would also like
to begin working through the Junior
Rockhound Program with the MAGS
youth in January, keeping records of
youth attendance and rewarding those
that are loyal to the program with a
new specimen for their collection
each month. Please contact Mike
Baldwin or James Butchko if you want
to help or find out more about the
youth program.

December Meeting
Minutes
Mike Baldwin
Called to order 6:30. 80+ Members
and at least 7 visitors attended the
annual Holiday Party. A few Members
worked to set up the room. Members
brought a variety of food to share. W.
C. McDaniel and Nannett McDougal-
Dykes shared the emcee responsibili-
ties. There were several rounds of
Rockhound Bingo, background music,
MAGS provided a gift for everyone.
Table centerpieces were given away
during the closing drawing. Several
Members pitched in to return the
fellowship hall to its original appear-
ance after the party. Happy Holidays
to everyone.

The MAGS Quarry
Displays
W. C. McDaniel
Displays
The MAGS quarry will be the area-
during membership meetings- for
members to display material from
any or all of the listed areas:
1. My Fines—Display material
field collected on club, federa-
tion, or individual trips.
2. My Collection—Display
items that are part of your col-
lection—field collected, pur-
chases, gifts, themed, or any
items that is part of your col-
lection and you want to show
off with a display.
3. My Projects—Display items
that you have created through
lapidary type activities.

Sales
All proceeds go to the club.

Main Things Come ...
from news reports

The picture shows a mastodon
bone, one of 200 found in Vir-
ginia. In 1983 a bricklayer wander-
ing through the woods in York
County saw something sticking
out of the stream. The landowner
at the time didn’t allow him to ex-
cavate, so he had to wait 35 years.
The Virginia Living Museum now
has the bones, and will put them
on display.
MAGS At A Glance
February 2019

- January 27: Board Meeting, 6:30 pm, St. Francis Hospital (February Meeting)
- January 30: Membership Meeting, 7:00 pm, "Bones, Then and Now"
- February 2: MAGS field trip, Richardson's Landing or Sugar Creek/DMC Field Trip, Stoney Bluff
- February 3: Presidents' Day
- February 10: Show Committee Meeting, 6:30 pm, Agricenter
- February 17: Board Meeting, 6:30 pm, St. Francis Hospital (March Meeting)

Memphis Archaeological and Geological Society
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