



Volume 62 ◊ Number 03 ◊ March 2016 ◊ A monthly newsletter for and by the members of MAGS

# Reelfoot Lake Archaeology

*Prehistoric Archaeologist Bill Lawrence to speak in March*



Reelfoot Lake in northwest Tennessee was created by the New Madrid seismic events of 1811-12. However, Native Americans had been living in the area for thousands of years before the lake was formed. During the earthquakes the area that is now underneath

Reelfoot subsided or sunk by as much as 20 feet while adjacent areas were uplifted. This caused land that had been well suited for Native American occupation to be too low and swampy for Euro-American agriculture. As a result hundreds of small *Continued, P. 7*

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## BE INVOLVED—IT'S MORE FUN

Look for email invitations from SignUp Genius. Every Member with email has already gotten an invitation to volunteer for the Memphis Mineral, Fossil, and Jewelry Show. Have you signed up?

We need volunteers for Thursday, Friday, Saturday, and Sunday (April



21-24). The shifts are set up in two-hour blocks; you can sign up for more than one shift.

If you are having a problem signing up, call or email Carol ((901) 757-2144 or [sgcarol@earthlink.net](mailto:sgcarol@earthlink.net)). **We need every Member to support the Show, so please volunteer.**

CAROL LYBANON

# 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

### President's Message

It's 9:00 A. M. on Saturday, April 23. Where are you and all the rockhounds in the Midsouth? Gathering at 7777 Walnut Grove in Memphis, waiting for the doors to open for the 37th annual Memphis Mineral, Fossil, and Jewelry Show. The show, dubbed the "The Earth Wide Open," is the club's premier big event of the year and will feature the following:

*Continued, P. 6*

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, TN.

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

MAGS Show Website: [www.theearthwideopen.com](http://www.theearthwideopen.com)

We aren't kidding when we say this is a newsletter for and by the members of MAGS. If an article has a byline the author is a MAGS Member, unless explicitly stated otherwise (we welcome articles by nonmembers). If there is no byline, the article was written or compiled by the Editor (a MAGS Member). Please contribute articles or pictures (everybody likes 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).

### March DMC Field Trip

WHERE: Clarksville, GA (fee site, \$10)

WHEN: Saturday, March 12, 10:00 A. M.

COLLECTING: Kyanite, mica, graphite

INFORMATION: Charles Carter, (770) 891-5947 or [fieldtrips@gamineral.org](mailto:fieldtrips@gamineral.org)

### 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)

## Crystal Clear



Ice is a mineral—sometimes. In order for something to be a mineral it has to pass five tests:

1. It must be naturally occurring (ice cubes in your freezer don't qualify, but snowflakes do).
2. It must be inorganic.
3. It must be a solid.
4. It must have a definite chemical composition.
5. It must have ordered internal structure (atomic arrangement).

Ice is just frozen water. Liquid water fails test #3. (It passes tests #1, #2, and #4). Solid water—ice—passes all of the first four (as long as it wasn't frozen by humans), but what about #5? Number 5 means, in effect, that it must be crystalline. OK, but what's going on that makes minerals form crystals?

Suppose we look closely at a drop of water. We see nothing but smooth, continuous water. If we magnify it with the best optical microscope, we still see relatively smooth water (we may see parameria swimming in it). If we could magnify it still farther, eventually we would see a kind of teeming something that no longer has a smooth appearance—it looks sort of like a crowd at a football game as seen from a great dis-

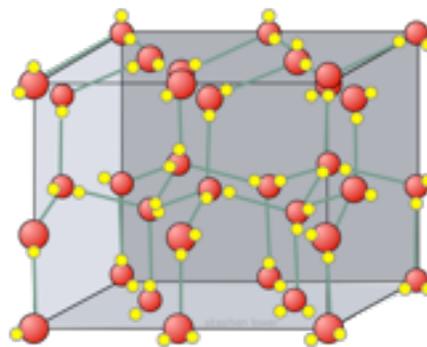
tance. Magnify it some more. We'd see a bunch of objects, moving around in three dimensions. These objects are water molecules ( $H_2O$ ). They are continually jiggling and bouncing, turning and twisting around another.

The water keeps its volume because the molecules are stuck together—there are forces between them. The jiggling motion is what we represent as heat; if we increase the temperature, we increase the motion. If we heat the water, the jiggling increases and the volume between the molecules increases. If we heat it enough the pull between the molecules isn't enough to hold them together and they fly apart. We've made steam.

In a drop of water the molecules are not all moving at the same speed. Some of them move fast enough to escape the surface—water vapor. Some of them move fast enough to escape completely—evaporation. For the most part, as many molecules leave the surface as come back, so a glass of water doesn't empty quickly; evaporation is slow. If we blow the moist air away, the number of molecules coming back is reduced, and evaporation is faster. The molecules that leave are the ones that have higher energy; the ones that are left have lower energy. So the liquid gradually cools as it evaporates. Blowing on water speeds up the evaporation. That's why blowing on your soup cools it.

Now suppose that we decrease the temperature of our drop of water. The jiggling between the molecules is steadily decreasing, so the density increases and the volume decreases as the temperature

is lowered. (Most liquids behave this way. Water is unusual in that the maximum density occurs at  $4^{\circ}C$ , and the density decreases slightly as the temperature is further lowered toward  $0^{\circ}C$ .) At  $0^{\circ}C$  the molecules “lock” into a new pattern, which is ice. The molecules don't suddenly stop moving. They vibrate about their stable positions in the lattice. As they move away from these positions the forces between the molecules act to bring them back (think of a child on a swing, going back and forth through the stable position at the very bottom).



The picture shows the normal structure of ice crystals. To understand some of the details, dig out those old chemistry books and look up “hydrogen bond.” (Using science-speak: “The most energetically favorable configuration of  $H_2O$  molecules is one in which each molecule is hydrogen-bonded to four neighboring molecules. Owing to the thermal motions described above, this ideal is never achieved in the liquid, but when water freezes to ice, the molecules settle into exactly this kind of an arrangement in the ice crystal.”)

The first thing you should notice in the image is how much empty space there is in this crystal lattice. The average *Continued, P. 4*

*Crystal Clear* distance between water molecules in this arrangement is greater than for liquid water. That's why water expands (a bit over 9%) when it freezes, which explains why pipes burst and why icebergs float.

Other solids are crystalline for essentially the same reasons. The details depend on the molecules involved, but the idea is the same. Crystalline solids are three-dimensional collections of individual atoms, ions, or whole molecules organized in repeating patterns. Some solids are crystalline even though they don't appear to be. Instead of forming big crystals such as the (*monocrystalline*) quartz and calcite we love to collect, they contain a very large number of microscopic crystals oriented in all directions. These are *polycrystalline* materials.

There are also *amorphous* solids, which don't have much structural order. Glasses and plastics are examples of amorphous solids. They can't be minerals, of course. And your fine "crystal" glassware is not crystalline. It's referred to as crystal because, years ago, the Italian word "cristallo" was used to refer to Murano glass imitations.

Suppose we have a material in which the "molecule" is a single atom. What kind of orderly arrangement of the atoms could we expect? Imagine taking a large number of identical spheres, such as tennis balls, and arranging them uniformly in a container. The simplest way to do this would be to make layers in which the spheres in one layer are directly above those in the layer below.

This arrangement is called simple cubic structure, and the unit cell is called the simple cubic unit cell or primitive cubic unit cell.

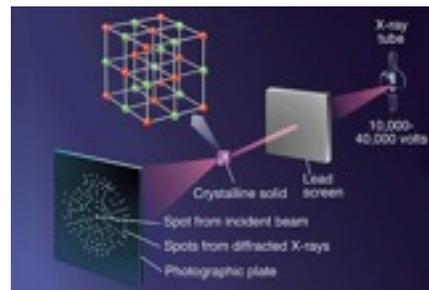
In a simple cubic structure, the spheres are not packed as closely as they could be (each atom contacts only the four nearest neighbors in its layer, one atom directly above it in the layer above and one atom directly below it in the layer below), and they only "fill" about 52% of the volume of the container. This is a relatively inefficient arrangement, and only one metal (polonium, Po) crystallizes in a simple cubic structure.

Some metals crystallize in an arrangement that has a cubic unit cell with atoms at all of the corners and an atom in the center. This is called a body-centered cubic (BCC) solid. Another cubic arrangement is called a face-centered cubic (FCC) array.

In monatomic crystals we can think of the atoms or ions as if they were spheres. This is a simplification, but it's a useful approximation. This leads to comparatively simple crystal lattices. Materials whose molecules consist of several atoms, of different types (such as silicon and oxygen in quartz), can form lattices with different, more interesting shapes. There are seven different lattice systems, some of which have more than one type of lattice, for a total of fourteen different unit cells.

At this point you may wonder how we know all this. Is it just theory or is there some evidence? One of the standard lab experiments in a "modern physics" course uses x-ray diffraction to produce patterns that indicate the

scattering from all of the atoms must be in phase. This, in turn, means that the atoms must be arranged in an orderly fashion. The details of the pattern are related to details of the arrangement.



"Wait a minute!", you may say. "I can look at a quartz crystal with light shining through it without seeing this kind of pattern. Aren't visible light and x-rays really the same thing, electromagnetic waves? Why don't I see the pattern?" Good questions. When you work through the math for this problem, you see that the equation for the locations of the bright spots involves both the spacing between planes of atoms in the crystal and the wavelength of the electromagnetic waves. If the spacing is less than half the wavelength, there is no solution. Physically, what this means is that when the wavelength is much bigger than the spacing (as it is for visible light), there's no diffraction pattern. The light goes right through the crystal.

This article has left out a few details—maybe more than a few. To get more into this requires at least some chemistry, and quantum mechanics for calculations. Any interest? The details matter, but if this article leaves you with the idea that minerals "like" to be crystals because

*Continued, P. 5*

*Crystal Clear* that arrangement of the atomic constituents is the most stable, it will have accomplished its purpose. And if you went on the recent MAGS field trip to the Ron Coleman mine, you'll have some good examples.

### Photo credits:

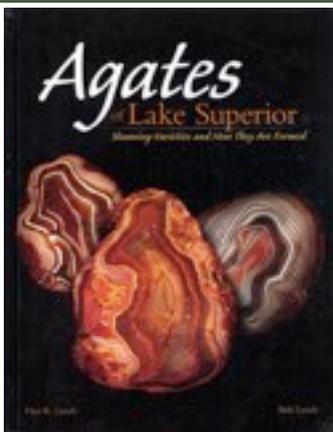
- *Matthew Lybanon took the picture of several crystals*
- *The ice crystal structure image is due to Stephen Lower and came from the University of California-Davis ChemWiki, [chemwiki.ucdavis.edu/Textbook\\_Maps/General\\_Chemistry\\_Textbook\\_Maps/Map%3A\\_Chem1\\_\(Lower\)/07%3A\\_Solids\\_and\\_Liquids/7.3%3A\\_Hydrogen-Bonding\\_and\\_Water](http://chemwiki.ucdavis.edu/Textbook_Maps/General_Chemistry_Textbook_Maps/Map%3A_Chem1_(Lower)/07%3A_Solids_and_Liquids/7.3%3A_Hydrogen-Bonding_and_Water)*
- *The x-ray diffraction diagram came from Mr. Fong's Lowell High School Chemistry, San Francisco, [www.sciencecool.org/solids/www.sciencecool.org/solids/FG11\\_039.gif](http://www.sciencecool.org/solids/www.sciencecool.org/solids/FG11_039.gif)*

*All images are used with permission.*

## **Book Review: *Agates of Lake Superior: Stunning Varieties and How They Are Formed* by Dan R. Lynch and Bob Lynch**

*Mike Baldwin*

If you have been on a MAGS field trip to Richardson's Landing, or Nonconnah Creek, or one of the mines of Memphis Stone and Gravel, then you probably have agates in your rock collection. If you are lucky you have a Lake Su-



perior Agate in your collection. If you are very fortunate you have several. This book is all about Lake Superior Agates. Lake Superiors are some of the most colorful and mysterious of all gemstones. *Agates of Lake Superior* explores agate structure, composition and appearance, with their concentric, ring-like bands and beautiful coloration. The movement of northern glaciers, and the unique weathering of rocks in the Mid-continent Rift are directly responsible for the composition and appearance of Lake Superior Agates. Due to the continued weathering by the lake and the forces of wind, waves, and ice, which break these stones free, visitors to the shores of Lake Superior still find an abundance of these agates. This book takes a look at the theories surrounding the formation of agates, tips on how you can find and identify Lake Superior Agates, and it gives you a view of hundreds of these beautiful stones. As a rock collector you will find this book to be interesting, informative, and fun to look through. As a serious agate collector you will find this to be a very resourceful tool for identifying, classifying and studying these incredibly mysterious stones.

## **CAGMAGS Swap**

The Central Arkansas Gem, Mineral and Geology Society will be having its annual swap meet on Saturday, April 9. It will be from 9:00 A. M. until 4:00 P. M. at the Elder Johnson Pavilion in Burns Park, next to the park visitors center. This is in North Little Rock, just off I-40 on Military Drive. There is no charge to set up. Bring your own tables or tailgate. This is a swap for rock or fossil related items only. Everyone is welcome to attend. Come meet other rockhounds from the area and just have fun. For more information contact Mike Austen at (501) 868-4553 or [Steelpony@aol.com](mailto:Steelpony@aol.com).

## **University of Memphis Egyptology News**

*Dr. Patricia Podzorski*

The Art Museum opening is scheduled for 5:00 P. M. the evening of Friday, April 8th. The opening is for two exhibits: "Do It" and a class exhibit on Asafo flags from Ghana (title pending). For more information about "Do It", please see the link below.

[www.memphis.edu/amum/doit.php](http://www.memphis.edu/amum/doit.php)

The Ancient Egypt Family Day is scheduled for Saturday, April 9th, from 10:00 A. M. to 2:00 P. M. This is an event for families with children 4-10 years old, or so. Activities include learning to write your name in hieroglyphs, coloring, drawing, etc.—all ancient Egyptian themed. The Egyptian Gallery will be open, although will look pretty much the same as before.

# MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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

## President's Message

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- ★ 30 dealers from 16 states will fill about 300 tables with earth treasures from around the world. The Show will have two new dealers this year: First, the Bone Hunters and Beadniks from Summerville, South Carolina, who will have fossils-like lots of shark's teeth they have collected. The second dealer is DB Opals, from Madison, Wisconsin; they will feature opals.
- ★ Distributors, exhibitors, the Rockzone and concessions fill section A.
- ★ So to help the 2016 Show MAGS Members (that is you), there are many ways and things you can and should do to help the Show. They include:

**1. Renew your membership in order to participate (free) in all Show events. Current membership status will be checked at the door.**

**2. Volunteer—sign up as the Show needs a lot of help**

**3. Donations-needed items:**

- Coke products, including water; can, or small bottles, **no 1- or 2-liter bottles**
- Plastic table covers (54 inches x 108 inches) white, red, or black
- Material for Rockzone

**4. Adopt a hospitality bag—help provide a Show benefit**

- For vendors and exhibitors
- Pick up empty bag at March or April meeting

- Pack bag with nonperishable packaged snacks, crackers, nuts, candy. No drinks in bags.
  - Bring bags to Show by Friday
  - Or you bring items for the bags and the Show will pack.
- 5. 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.
  - Member must sign each ticket. One admission per ticket.
  - Ticket holder is admitted free to Show.
  - You are not responsible for tickets that are not used.
  - At the conclusion of the Show each Member must pay—by June 1—the Show \$2.00 for **each redeemed ticket**. After June 1 you must pay \$3.00 for **each redeemed ticket**.

**6. Handouts-market the show**

- Notepads
- Show tickets
- Small poster
- Rockzone

*W. C. McDaniel*

## The Earth Wide Open

*Jim Butchko*

In less than two months MAGS will have "The Earth Wide Open" for you at our 37th annual Memphis Mineral, Fossil, and Jewelry Show. There will be hundreds of tables of specimens and gems to buy or just look at. Grab bags are expected to sell out so buy early

and buy often. Carol has set up the SignUp Genius and sent invitations, so we can all look over the volunteer positions and times and pick the ones we like best. We also depend upon sponsors to donate money or material in the weeks leading up to the Show. Start bringing bottled water, soda and snacks to the March and April meeting or send cash donations to Matthew Lybanon. If you know of a company or individual that would like to sponsor a particular exhibit, call or email Jim Butchko. I am looking forward to seeing you all there.

## March Birthdays

3	Debi Stanford
4	Chris Hill Ragan Medlin
5	Walter Davis
7	Payne Wilson Kristen Erickson
8	Stacy Cowell Barbara Milka
10	Pat Scott Tess Cannito Kathleen A. Eglsaer
11	Nancy Folden
15	Amelia Herrington
16	David Loyd
17	Robert Cooper
18	Lauren Brem
23	Nathaniel Reid
24	Kalissa Bearden
26	Jennifer Craig Stephany Rainwater
27	Della Gitter
28	Hudson Hebert
30	Hisami McNeil
31	Emilia Stockwell Hunter Hill

*Reelfoot Lake Archaeology* mound sites that would have been destroyed by historic agriculture are preserved in the swamps of Reelfoot Lake.



Our group will take a pontoon boat ride from Reelfoot Lake State Park across the lake to visit a group of 21 prehistoric Indian mounds that are seldom visited by the public. In the event of bad weather we will take a bus to visit a similar mound group within Reelfoot National Wildlife Refuge that are accessible by road. In addition to the archaeology we will likely have a great opportunity for wildlife viewing as well. Bald eagles, white pelicans, and a variety of waterfowl are usually abundant at Reelfoot at this time of year.

### Upcoming Programs

- ➔ **March:** Bill Lawrence, Reelfoot Lake Archaeology
- ➔ **April:** W. C. McDaniel, What's Going On With the Show
- ➔ **May:** Dr. Robert Connolly, My Time At Chucalissa

If you have any suggestions for programs, please let Carol Lybanon know at (901) 757-2144 or [sgcarol@earthlink.net](mailto:sgcarol@earthlink.net). We're always looking for new, interesting topics.

## Fabulous Tennessee Fossils

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

### *Stigmaria*: The "Root" of the Problem

Last month's "Fabulous Tennessee Fossils" was written about an east and middle Tennessee brachiopod called *Dinorthis*, so while your minds are still on that part of Tennessee, allow me to introduce you to Tennessee's paleobotanical record. While I was a graduate student at Auburn University in the early 1980s, my major professor was Dr. Robert A. Gastaldo, who is a paleobotanist. He often commented on the domination that invertebrates, vertebrates (especially dinosaurs), and microfossils had over paleobotany in the professional world of paleontology. After all, the eras of the geologic time scale used was mostly based upon, and wholly named, for animals (e. g., Paleozoic ("ancient animals"), Mesozoic ("middle animals"), and Cenozoic ("new animals"), and even our current eon is Phanerozoic ("visible animals").

Under Bob Gastaldo's watchful mentorship I completed my M. S. degree on the fossil invertebrates with the Upper Cliff Coal deposits (Pennsylvanian age Pottsville Formation equivalent) which can be traced up the Appalachians from Alabama to New York. While I focused on the invertebrate fossils, Bob made sure that I was well-grounded in the paleobotany of the associated plant fossils as well. Those Alabama strata trace through the Cumberland



Kingdom Plantae  
Phylum Tracheophyta  
Class Lycopsidea  
Order Lepidodendrales  
Family Lepidodendraceae  
Form Genus *Stigmaria* (Brongniart, 1822)  
Form Species *ficoides* (Sternberg)

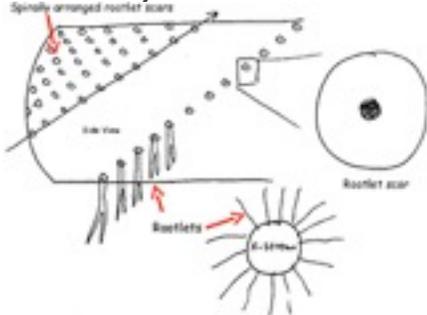


**Figure 1.** *Stigmaria ficoides* specimens from the UT Martin collection. Note the tubular shape and pits for rootlet attachment in each specimen. The upper specimen from Campbell County still retains the black coal coating, but the lower tan specimen is preserved as a sandstone "duripartic cast" in the shape of *Stigmaria* (Photo by MAG, Scale marked in cm).

Plateau of Tennessee and contain a rich fossil plant record studied by many paleontologists. One of the more conspicuous and often collected Pennsylvanian plant fossils is *Stigmaria ficoides* (Figure 1), which is readily identifiable by its distinct linear or dichotomous branching shape and a surface covered with nail-head sized pits. Highlighting *Stigmaria* in this article not only allows

*Continued, P. 8*

*Fabulous Tennessee Fossils* me to bring plant fossils into the FTF mix for the first time, as well as honor my old advisor's wish not to slight paleobotany for the masses, but I also can introduce you to the concept of "form genera" as a necessary evil in taxonomy.



**Figure 2.** Diagram illustrating morphology associated with *Stigmaria ficooides* and how the pattern of rootlets is used in naming the form species (drawing by MAG).

*Stigmaria ficooides* usually is encountered as a slightly flattened cylindrical sandstone cast surrounded by a paper-thin black coal covering with pit indentations. The sandstone core gives the appearance that *Stigmaria* may have been a hollow plant (like a horsetail), rather than having dense wood interior, and this is largely a correct surmise. *Stigmaria* is the fossilized cast of a rhizome (not a true root as it is often labeled, but similar in function) belonging to a variety of species of extinct club moss trees (yes, the word "moss" and "tree" together does seem odd, but during the Carboniferous, lycopods were tree-formers). These tropical plants were without dense woody tissue and their "pithy" interiors decayed faster than the more dense outer surface

of the rhizome "root". Sand and sandy-mud would infill the hollowed centers, thus entombing the rhizome both inside and out as a "duripartic cast" with minimal compaction and no exposure to the surface. It's typical to find *Stigmaria* preserved in their original position upon death-in-situ-marking the root zone of a clastic swamp. It is common to trace individual *Stigmaria* rhizomes laterally for meters along a coal mine highwall until it connects with a vertically-oriented base of a tree trunk belonging to the lycopod genus *Lepidodendron* (among other genera). The small pits that make *Stigmaria* so easy to identify served as attachment points for thinner "rootlets" that radiated outward in a 360° circle around the *Stigmaria* rhizome serving as additional anchorage as well as more tissue surface for more water and nutrient uptake.

Many of you are wondering why, in the previous paragraph, I write that the genus *Stigmaria* connects to the genus *Lepidodendron* (among other genera); an especially curious statement because the Linnaean system of taxonomy uses a single binomial genus and species name for each unique species. So is the plant *Stigmaria* or *Lepidodendron*? Well, yes! Plants are composed of many very different looking parts that disarticulate seasonally and upon death of the plant. Even individual leaves can vary along the same branch. In the early days of paleobotany, "whole plant" paleobotany was complicated by plant fossils accumulating in a jumbled mix of parts and different species, so much so that many "new species" of plant

were named based upon differences being formally described using different parts of the same plant, resulting in a single fossil tree species with a dozen or more genus and species names that actually refer to plant parts on the same or similar taxa. Names like *Stigmaria* convey morphology and easy recognition of these fossils, so they proved useful for identification and communication, even if they have no real basis in genetic identity. Such taxonomic names are referred to as "form genera" (see taxonomic box at the beginning of this article). We recognize the form genus *Stigmaria* as a rhizome for lycopod tree *Lepidodendron*, which also has leaves called *Cyperites* and sporangia called *Lepidostrobus*. *Stigmaria ficooides* adds the species epithet and adds more clarification of the morphology of the pits on *Stigmaria*, thus the term *ficooides* ("fig tree like") in this instance identifies a specific variety of the form genus *Stigmaria*. Now that I have gotten to the "root" of the *Stigmaria* name problem, I promise we will delve more into the world of paleobotany later, but for now I hope you are "well-rooted" in the basic idea (yeah, I know...pretty bad pun).



Please donate soda and water to be used at our Show.

Bring them to the March and April meetings.

These drinks will be used by MAGS volunteers as well as vendors. The Show is thirsty work!

## New Members

- Vicki Sanders
- Danny Crumbliss
- Karen Joseph

## Junior Programs

*Jim Butchko*

At the February meeting, the Juniors learned about the different states of matter and did a little water filtration experiment. At the March meeting we will be working with mosaic art, with stones and other material.

## January Board Minutes

*Mike Baldwin*

The meeting was conducted via email reports, because the meeting date would have been New Year's Eve.

**Secretary:** December minutes were distributed to the Board via email.

The January 2016 newsletter was printed and mailed on December 28 to the 23 members on our USPS mailing list. A Request for Payment for November and December newsletter postage was emailed to the treasurer on December 28.

**Treasurer:** Bonnie distributed the December checking register and checking summary report, monthly budget figures for 2015, and the 2015 year budget totals via email to the Board for review. Bonnie sent the church two checks, one for rent and one for our share of the screen. She also reimbursed Mike for newsletter printing and mailing expenses. The 2016 SFMS dues check has been written and will be mailed this weekend. Bonnie requested information for the 2016 budget.

**Adult Programs:** The January program will be "Reelfoot Lake Geology", by MAGS member, Alan Parks. The February program will be "Semi-precious Stones", by Dr. Podzorski. In March Bill Lawrence will talk about

archaeology at Reelfoot Lake, followed by a field trip to Reelfoot Lake the following day. The April program will be devoted to preparations for and information about the upcoming Earth Wide Open Show.

**Membership:** Since our last Board Meeting, we have 16 renewals and 2 new Members. So far we have a total of 35 renewals for 2016. These and any other Members who renew by the end of the January Membership Meeting will be entered into the drawing for the Mexican Geode that will be presented at the January meeting. Also anyone who mails in a renewal on time will be included in the drawing.

**Newsletter:** Matthew published and distributed the first 2016 issue on December 26. The issue included a listing of all the MAGS newsletter awards received from SFMS and AFMS for 2015. Those awards are also listed in the December Membership Meeting Minutes. Articles and reports for the February newsletter should be emailed to Matthew on or before January 15.

**Webmaster:** Domain registration for the MAGS website has been renewed for 2 years, effective January 1, 2016. The home page and newsletter pages have been updated to reflect January calendar and newsletter information. Web analytics for 2015 are: 20,361 page impressions; 8501 visitors; most page impressions in one month was April 2015 with 2444; and most visitors in one month was September 2015 with 1238.

No reports from Field Trips, Junior Programs, Librarian, Show, Rock Swaps/Historian.

### Old Business:

- Plan for Hospitality at Membership: Mike stated his opinion about assigning members to provide hospitality on Membership Meeting nights. We can't depend on Members fulfilling assigned duties to be there before and after meetings and

do all that is required. We have to aggressively seek a person [or persons] to fulfill those duties in an official capacity. We currently only have 40 or so adult members attending the meetings and another 20 or so that are occasional attendees. If we can't find a permanent hospitality coordinator, an alternative plan would be to drop the refreshments portion of our monthly meetings.

- Follow-up on volunteer program. W. C. will send out a written proposal for review. Discussion of the volunteer program will be part of the February Board Meeting.

### New Business:

- Effective in early 2016, there will need to be a new plan for printing paper copies of the newsletter. Mike has a printer that could be used, and asked the Board to approve paying for ink for that printer.
- Mike would also ask the Membership Director to query the 23 Members on our USPS mailing list to see if any have an email address. If so, they should not be receiving paper copies of the newsletter.
- Printing our newsletter requires about 150 sheets of paper every month. A ream of copy paper costs approximately \$5.50 and will last about 3.34 months, so we need about 4 reams of paper per year. Postage costs \$.49 per newsletter. A year's worth of newsletter ink would be about \$70.00. Even without factoring the paper costs into the total, that's \$8.90 per recipient per year. Mike would like to propose that we add a hardcopy newsletter fee to our membership dues for those who want a mailed copy. We can discuss this at the February Board Meeting and how much that fee should be.

## January Meeting Minutes

*Mike Baldwin*

*Continued, P. 10*

*January Meeting Minutes* Meeting called to order at 6:09. 3 visitors, 3 new Members, and 38 Members attending. W. C. passed around a volunteer sign-up sheet and asked Members to help with hospital-ity duties. Federation dues have gone up this year. We have 327 members and we pay Federation dues based on that number.

**Field Trips:** January–next weekend to Ron Coleman's quartz mine in Jes-sieville, Arkansas. Sign-up and waiver forms are on the back table. Trip to Pickwick on February 13, the day after the club meeting. We will visit 4 sites.

**Show:** We need help to select food vendor. Dealer space is sold out. There are Show notepads on the back table to take and pass around.

**Library:** New book, *Agates*, which is about Lake Superior Agates.

**Newsletter:** Latest issue had a list of the winners of the federation article categories. None of those winners are professional writers. You could win next year.

There were 3 displays. Juniors were dismissed to their program. Carol introduced Alan Parks, who has been a MAGS Member since 1994, and has been President and Show Chair. Alan gave an interesting program on Reel-foot Lake, which included both his personal history with Reelfoot and information on its geology.

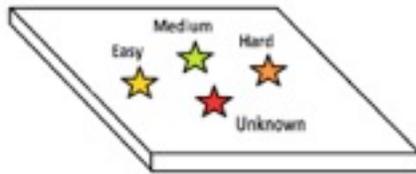
Leigh Scott won the geode, in the drawing open to Members who have renewed for 2016.. New Member Leah Gloyd, won the display contest. Meet-ing adjourned at 8:24.

**Jewelry Bench Tips** by Brad Smith

IDENTIFYING UNMARKED SOLDERS

There are plenty of ways to mark your sheet or wire solders,

but suppose you forgot to mark them and have a couple that you can't identify. The answer is to compare the melting temperature of the unknowns with that of a known solder. What I do is take a thick scrap of copper or nickel and arrange several solders on it. Ideally, I would have a sample of easy, medium, and hard known solders surrounding the unknown solder. Then I heat the plate from the bottom and watch the order in which the solders melt.



INEXPENSIVE ELECTRIC WAX PEN

You can make your own wax pen from a small soldering iron plugged into a light dimmer switch for heat control. Both compo-nents are easily found at Radio Shack, a big hardware store, or at Harbor Freight. As an example of the components, see [www.harborfreight.com](http://www.harborfreight.com) items #43060 and #47887.

File the tip of the soldering iron into the shape you prefer, or even better get a soldering iron with replaceable tips. Then you can make several tip shapes for different tasks. Set the dimmer control just hot enough to melt the wax without producing any smoke.

A tip design that I find ideal for some work is a length of small gauge wire that lets me reach in around the model to melt some wax. The wire is about 15 mm long

and 18 or 20 gauge. To conduct heat all the way to the tip, I use Sterling wire and silver solder it into a hole on the end of a copper or brass rod that will fit into the soldering iron.

*Bench Tips for Jewelry Making and Broom Casting for Creative Jewelry* are available on Amazon. text

**Area Show Corner**

The Georgia Mineral Society's 48th Annual Mother's Day Week-end Gem, Mineral, Jewelry, and Fossil Show will take place two weeks after the MAGS Show. The dates are May 6, 7, and 8. Look for more details in the April and May issues of *MAGS Rockhound News*.

The Harrison County Gem and Mineral Society will hold its show on May 28 and 29. The 37th Annual Harrison County Gem, Mineral, Fossil and Jewelry Show will be in Biloxi, Mississippi, on Memorial Day Weekend. Look for reminders in future issues.

**Missouri Field Trip**

W. C. McDaniel

Save these dates for our annual trip to Missouri, April 2-3. Trip highlights include:

- ✓ Collecting druse quartz (abundant), barite, calcite, and dolomite
- ✓ Visiting at least three sites
- ✓ Easy collecting and usually abundant
- ✓ Specific trip details by early March



## Oldest Volcanic Eruption Picture?



Is this cave painting the oldest depiction of a volcanic eruption? What are the patterns that look like something spraying out of a nozzle?

Previously, the oldest-known recording of a volcanic eruption was a Neolithic mural discovered in the ruins of Çatalhöyük, an ancient city in southwestern Turkey. The picture above shows a painting on the wall of the Chauvet-Pont D'Arc cave in France. This cave is one of the most famous underground caverns in the world, housing one of the oldest and best-preserved collections of prehistoric cave paintings ever discovered. Now, researchers believe that some of the most mysterious, abstract designs found in the cave may be among the earliest paintings of volcanic eruptions.

A few drawings in the Megaloceros Gallery, deep within the interior of the cave, have puzzled archaeologists since the cave was discovered in 1994. According to a new study published in the journal *PLOS One*, researchers believe the images could depict volcanic eruptions nearly 37,000 years ago.

The closest volcano to the Chauvet cave that was active

around the time the paintings were made would have been about 35 km northwest of the caverns, in the Bas-Viverais region. While volcanic eruptions can take many different forms, geologists believe that the Bas-Viverais range may have had “strombolian” eruptions, which look similar to the firework-like spray depicted on Chauvet’s walls. The area around the Chauvet cave was likely populated around this time and far enough away that any inhabitants would have been safe from the eruptions but still have a good view of the action from the hills above the cave entrance.

Despite the large number of caves studied since the early 19th century, no painting, petroglyphs, or engravings depicting natural scenery or geological phenomena from the Upper Paleolithic period had been found in Europe. Radiocarbon dates have now robustly constrained the oldest occupations and drawings in the Chauvet cave to between 37 and 34 ka (thousands of years ago). The volcanic eruptions were dated, using  $^{40}\text{Ar}/^{39}\text{Ar}$ , between  $29 \pm 10$  ka and  $35 \pm 8$  ka.

The dates overlap, and the researchers propose that humans are likely to have witnessed one or several eruptions and depicted them using these complex signs. If this hypothesis is correct, these depictions predate over 34 millennia the observation by Pliny the Younger of the AD 79 Vesuvius eruption and by 28 ka the Çatalhöyük mural (Turkey), currently considered the oldest eruption painted by a human hand.

The journal article has more

details.

**Ref:** Nomade S, Genty D, Sascó R, Scaou V, Féruaglio V, Baffier D, et al. (2016) A 36,000-Year-Old Volcanic Eruption Depicted in the Chauvet-Pont d’Arc Cave (Ardèche, France)? *PLoS ONE* 11(1): e0146621. doi:10.1371/journal.pone.0146621

**Editor’s Note: More ancient art follows.**

## Oldest Campsite Picture?



An engraved object recently found at the site of Moli del Salt in Spain and dated to the end of the Upper Paleolithic may show a hunter-gatherer campsite. The figure shows a closeup of one part of the engraving.

The Paleolithic art object in question is an engraved schist slab found at the rockshelter site of Moli del Salt in Northeastern Iberia during the 2013 field season. The slab displays seven semicircular motifs. Because of its shape and proportions, the scientists interpreted these motifs as huts.

For more details see:

**Ref:** Garcia-Diez M. & Vaquero M. 2015. Looking at the Camp: Paleolithic Depiction of a Hunter-Gatherer Campsite. *PLoS ONE* 10 (12): e0143002; doi: 10.1371/journal.pone.0143002

# MAGS At A Glance

## March 2016

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
28	29	1	2	3 Board Meeting, 6:30 pm, St. Francis Hospital	4	5
6	7	8	9	10	11 Membership Meeting, 7:00 pm, "Reelfoot Lake Archaeology"	12 MAGS field trip, Reelfoot Lake/ DMC field trip, Clarkville, GA
13	14	15	16	17 	18	19
20	21	22	23	24	25	26
<b>Time to volunteer for the MAGS Show</b>						
27 	28 Show Committee Meeting, 6:30 pm, Agricenter	29	30	31 April Board Meeting, 6:30 pm, St. Francis Hospital	1	2

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