



Volume 60 ♦ Number 10 ♦ October 2014 ♦ A monthly newsletter for and by the members of MAGS

# The Mining Cycle

*October Presentation, an Introduction to the October Field Trip*



Cycles—we notice the cycle of the seasons. We appreciated the “A/C Appreciation Day” field trips this summer. Fall is here, and now we can move outdoors.

In last month’s MAGS meeting presentation, MAGS Member Herb Nicholson explained the

rock cycle. And at the October 10 meeting MAGS Member Alan Parks will fill us in on the mining cycle. (We’re fortunate to have Members who are experts in their fields.)

Alan’s presentation will be particularly timely *Continued, P. 3*

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## JOIN THE TEAM

Most MAGSters attend our annual Mineral, Fossil, and Jewelry Show, and you know what it’s like. There’s lots to the Show: dealers, demonstrators, educational exhibits, children’s activities, grab bags, our rock food table, food you can eat, and more.

All this doesn’t just happen. There is a group of people who put all this together: the Showteam. And there are preliminaries, too. For example,

someone updates the mailing list of thousands of people who receive promotional postcards.

If this sounds interesting (or sounds like fun), now is a good time to get involved in putting on the 2015 Show. There is a need for someone to work on marketing and sponsorship, just to mention one thing. Contact Show Chair James Butchko at (901) 743-0058 or [butch513j@yahoo.com](mailto:butch513j@yahoo.com) to join.

# 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

MAGS General Membership Meetings and MAGS Youth Meetings are held at 7:30 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)

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).

### October DMC Field Trip

WHERE: Taylorsville, Spencer County, Kentucky

WHEN: Saturday, October 11,

COLLECTING: Ordovician rocks and fossils

INFORMATION: Charles Oldham, (502) 241-8755 or [charlesoldham@ymail.com](mailto:charlesoldham@ymail.com).

### 2014 Program Competition Winners

... is the title of the lead article in the current *A.M.F.S. Newsletter* (which can be downloaded from the AFMS website). Affiliate clubs and their members will be able to borrow these programs from their Regional Program Library later this year. All will be in DVD format.

### SFMS Annual Meeting

The SFMS annual meeting will be in in Pascagoula, Mississippi, on November 7 and 8. See P. 5 for more details.

### 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)

*The Mining Cycle* because the October field trip, *Continued from P. 1* on the following day, will go to Memphis Stone & Gravel Company's Anderson Plant in Nesbit, Mississippi. The following summary of the mining cycle is based on information on Memphis Stone & Gravel's website, and tailors the explanation to MS&G's operations. There are five stages:

- ▶ Exploration
- ▶ Planning
- ▶ Mining
- ▶ Processing
- ▶ Reclamation



*Exploration:* Memphis Stone & Gravel continuously explores for construction aggregate, primarily found in sand and gravel deposits in areas north and south of Memphis. Following the field work the company's geologist reviews the results, and (if material with the right characteristics is identified) estimates the resource to determine how much material could be mined.

*Planning:* Planning is important because of the very high costs associated with mining. Permits are required from regulatory agencies, including the Tennessee De-

partment of Environment and Conservation, Mississippi Department of Environmental Quality, U. S. Environmental Protection Agency, Mine Safety and Health Administration, and U. S. Army Corps of Engineers. And property owners demand that MS&G know how the land will be put back following the mining activity.

*Mining:* First the overburden must be stripped from the resource. The type of equipment depends on the digging conditions, and could include scrapers, tractors with pans, and excavators and haul trucks. Next MS&G mines the resource using hydraulic excavators or draglines. All the material is unconsolidated and is relatively easy to dig using standard construction equipment. It is also naturally moist and does not generate dust when it is mined or transported. From the pit, the mined material rides on an over-the-land conveyor belt system to a wash plant for processing.

*Processing:* This is where the rock piles we will "mine" during the field trip come from. Some of the mined material (e. g., clay gravel) can be sent directly from the mine to the job. But most of the material is "washed" sand and gravel. Put simply, MS&G separates the sand from the rock and washes out the fine (clay) particles. The sand and rock are placed in piles to drain the water away from the material. The "washed" material is then used to make products such as ready-mix concrete, asphalt concrete, landscape materials, and drainage rock.

*Reclamation:* State law requires any mining company to put back

all the soil that was removed to get the resource. Good reclamation can add value to the land by creating beautiful lakes and land that is conducive to development. MS&G's immediate goal is site stabilization through revegetation using a mixed variety of grasses best suited for that purpose, and the company often returns the land in pasture suitable for livestock or plants trees to create a new forest. MS&G works with property owners to develop a solid reclamation plan that will keep in mind future development goals. The goal is a property owner who not only enjoys the income provided by mining the resource, but is happy with the land when reclamation is finished.

This is just a summary of part of the subject of the October presentation. Come to the meeting to hear Alan Parks tell you more.

### October 11 Field Trip



The October MAGS field trip will go to Memphis Stone & Gravel Company's Anderson Plant in Nesbit, Mississippi, around 30 minutes from Memphis. We will be collecting the gravel from stockpiles. The *Continued, P. 4*

*October 11 Field Trip* meeting time is 8:30 A. M., and we will collect for about four hours. The Field Trip Leader is Alan Parks, (901) 481-9730 (cell).

We will collect chert gravels with fossils (Mississippian, Devonian, Silurian), petrified wood, agate, conglomerate, quartz, and other rocks and minerals associated with Pleistocene/Pliocene regional alluvial terrace deposits.

Participants should bring a bucket or some other container and a rock hammer. No digging is necessary. A spray bottle with water is very helpful.

Though the difficulty level is very low this is an active mine with dangerous areas. All safety rules must be followed (a copy of the safety rules can be obtained from the Field Trip Leader). Safety glasses must be worn any time eye hazards may exist. All young children must be under constant adult supervision. Bring plenty of water and sunscreen.

The site is near Memphis, and as mentioned the difficulty level is low. There are no long walks to collecting areas, no climbing (except up on rock piles), and you don't need wading boots.

You can obtain a field trip bulletin from Field Trip Chair W. C. McDaniel, (901) 274-7706 or [19fossil48@gmail.com](mailto:19fossil48@gmail.com).

## August Board Minutes

*Carol Lybanon*

The MAGS Board of Directors met July 31 at St. Francis Hospital, 5959 Park Avenue. The meeting was called to order at 6:40 P. M. Present were:

Mike Baldwin, Ron Brister, James Butchko, Bob Cooper, Bonnie Cooper, Bill Gilbert, Charles Hill, Carol Lybanon, Matthew Lybanon, W. C. McDaniel, Nannett McDougal-Dykes, Paul Sides.

**Secretary:** Carol thanked Mike for taking the July minutes. The minutes were accepted as presented.

**Treasurer:** Bill reported an NSF dues check. W. C. will call the Member to see if we can get both the dues and the bank fee taken care of. Bill inquired which account he should debit for the funds to cover Junior gifts. He was told that these expenses were part of operations. The proceeds from the amethyst ring raffle should go to the Show account. The next large expenditure will be for three months' rent at the church. Those Board Members with signature rights on the club checking account will meet at the bank on Saturday morning and try to clear up all unresolved matters concerning the account. The Treasurer's Report was approved as submitted, subject to audit.

**Membership:** Bob reported one new Member.

**Field Trips:** W. C. reported that nine Members attended the Discovery Park field trip. On August 9 there will be a field trip to Belz Museum. There is a question about the Vulcan trip; W. C. will look into it. The October field trip will go to Memphis Stone & Gravel. November: Black Rock. December: another rock quarry in Arkansas. Paul suggested that W. C. consider a mine safety class as one of our field trips. The Board thought it was a good idea.

**Adult Programs:** Ron reported that the Discovery Park program was very good; he thanked Matthew and Carol for arranging it. The August program will be the indoor rock swap. September: Herb Nicholson. October: Alan Parks. November: Michael Gibson.

**Junior Programs:** September: Na-

tive Americans. October: fossil dig. November: Cave paintings.

**Show:** Jim thinks it is time to get started on the 2015 Show. Matthew gave a financial summary for the 2014 Show. We have not made any charitable distributions of funds so far. Matthew will make the formal presentation of the Show profits at the indoor rock swap.

**Library:** Ron has two boxes of books that were donated to the library. We can use some of them, and sell the rest. He also has reports from Chucalissa to sell.

**Newsletter:** Matthew says the August newsletter will be sent out tomorrow. He again urged Members to send him material.

**Webmaster:** Mike says the website will be updated tomorrow. He asked for someone else to take over the club website. He has been doing it for 17 years and would like to rest for a while.

**Historian/Rock Swap:** Nannett reported she has great door prizes for the indoor picnic. She asked Board Members to bring canned drinks. She is presently planning an outdoor picnic on October 25, at Shelby Farms.

### Old Business:

▶ Ron thought we should talk to the membership to find out about membership skills. Paul has named Nannett and David McAlister to the Nominating Committee. He is trying to line up one more person for the committee.

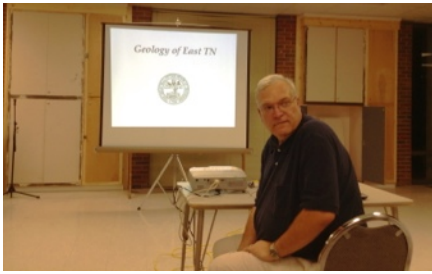
▶ Paul appointed James Butchko to head the Show Committee. Jim accepted and the Board approved his appointment. W. C. will continue to handle the dealer part of the Show. We need to update the Show website with the 2015 dates. The first Show Committee meeting will be on Monday, September 8, pending approval by the Agricenter. Jim will contact Members to serve on the Show *Continued, P. 5*



# MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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

## September Program



Herb Nicholson's "Geology of East Tennessee" program at the September meeting gave MAGS-ers lots of good information. Thanks, Herb.

## October Birthdays



- ★ Michael Baldwin
- ★ Rebecca Barnett
- ★ Gail Bessett
- ★ Robin Brown
- ★ Michala Demo

- ★ John Doherty
- ★ Tootie Fontenot
- ★ Jan Gish
- ★ Charles Hill
- ★ Alan Jacobs
- ★ Katherine Kitzmann
- ★ Marian Klug
- ★ Matthew Lybanon
- ★ Taylor Nichols
- ★ Ricky Odom
- ★ Virginia Pierce
- ★ Linda Plowman
- ★ Keith Riding
- ★ Chris Vaughn

## 2nd Annual Geology Day

### *at The Oren Dunn City Museum*

10 AM-3 PM      Saturday, November 1, 2014

689 Rutherford Road @ Ballard Park, Tupelo, Mississippi 38801

**Admission \$1**

George Phillips, Mississippi Museum of Natural History

Dr. Terry Panhorst and Dr. Louis Zachos, University of Mississippi Department of Geology  
will be on hand to identify your rock and mineral finds

Check out the vendors for that special gift.

Native American artifacts and exhibits

Games for the kids      Geode Cracking      Out of this world displays

**Presented by**

**North Mississippi Gem and Mineral Society**

**and**

**Oren Dunn City Museum**

## Jewelry Bench Tips by

Brad Smith

### SILVER DISCOLORATION

Working with jewelry involves an ever increasing number of skills. Chemistry is one of them that comes into play when dealing with a discoloration on the metal caused by a chemical reaction between it and the environment.

In the case of Sterling silver there are three discolorations we typically encounter: a tarnish, a firescale, and a firestain. Each is different in its cause, in its cure and in its prevention. All three have to do with the metals in the Sterling alloy (92.5% silver and 7.5% copper) and how they react with oxygen and the heat of soldering or with pollutants in the air over the long term.

Tarnish is a grayish coating that builds up slowly on the surface as a result of a reaction of the silver with sulfur-based compounds in the air. Typically these are pollutants from the burning of petroleum fuels, but they can come from other sources as well. I once tarnished all the silver in my display case by putting a pretty specimen of iron pyrite in with the jewelry. Turns out pyrite has sulfur in it! Sulfur combines with the silver to form a grayish silver sulfide film on the surface.

Preventing tarnish involves keeping sulfur away from the metal. Plastic bags will help, and anti-tarnish strips are available from jewelry supply companies to pack near your items. Tarnish is easily removed by hand polishing with a jeweler's cloth or with one of the products sold for cleaning

the good silverware for holiday dinner.

Another way is to remove it chemically. Put a piece of aluminum in the bottom of a dish large enough to contain your piece. Heat enough water to cover the silver. Mix in 2 tablespoons of sodium carbonate per cup of water and pour into the dish. Be sure the silver touches the aluminum. Sodium carbonate is the main ingredient in washing soda. Read the labels in grocery and hardware stores.

The second type of tarnish is called firescale. It is the dark gray to charcoal colored film that forms on Sterling or other copper alloy like copper or bronze when we heat it with a torch. The copper in the alloy reacts with oxygen in the air to form a dark cupric oxide coating on the surface. Luckily, the oxide is easily removed by dissolving it in a mild acid—generally called a pickle. It's important that we not let firescale form on a solder joint because it will block the flow solder over the joint.

Prevention can be done two ways. Most common is to use a flux, a borax-based solution applied to the metal before soldering. When melted, borax forms a thin glassy layer that keeps oxygen away from the metal. A second way is to do your soldering on a charcoal block. Together with the flame, charcoal greatly reduces the amount of oxygen in the area being soldered. In either case oxygen is prevented from reaching the metal, so no cupric oxide firescale is formed.

A second oxide can also be formed when soldering copper or

a high copper content alloy like bronze or brass. It's called cuprous oxide and is reddish in color. That's why a black looking piece you put in the pickle sometimes comes out red. Problem is that while the black cupric oxide is dissolved by a pickle, the red cuprous oxide is not. The discoloration can be sanded or polished off, but an easier way is to use a "super pickle". This is a mixture of fresh pickle with a healthy shot of hydrogen peroxide from the local store.

I've saved the worst form of discoloration, firestain, for last. Think of firescale (above) as like getting dirt on your shirt that you have to wash off. Firestain is like getting ink on it. The discoloration is not just on the surface, it seeps down and stains the material. Firestain happens when we heat a piece of silver too hot, too long, and/or too many times.

Firestain occurs when the oxides start to build up below the surface of the metal. You generally don't notice it until after polishing. It appears as a darker area of the surface and is easy to spot when viewed under light bounced off a piece of white paper. Because firestain is below the surface, there's no easy bench tip solution. Depletion gilding may work for some pieces. Otherwise, removing it calls for sandpaper and aggressive polishing.

A much better approach for a piece that will require a large number of solderings is to protect the metal from developing firestain by applying liberal coats of a firecoat. Regular soldering flux will provide

*Continued, P. 8*

*Jewelry Bench Tips* some protection but will not be as effective as preparations made specifically for the task.

SOLVENT DISPENSER

Frequently I need to fill a small bottle with alcohol, like an alcohol lamp or one of the nail polish bottles that I use for the yellow ochre anti-flux. Often I can't find a small funnel and end up spilling almost as much as I get into the bottle. It's wasteful, and the fumes can't be too good for you either.

A neat and inexpensive solution is to use a lab dispensing bottle to store small quantities of the solvents you frequently use. It has a wide mouth for filling and a fine tip for dispensing. You can get a small stream or just a drop or two. With the bottle's fine tip I don't spill a drop.



There are many suppliers on Google. One I've used is Carolina Biological Supply Company at [www.carolina.com](http://www.carolina.com). The bottle is Catalog # 716580 Unitary Wash Bottle, Low-Density Polyethylene, 125 mL, US\$ 5.35.

Get all 101 of Brad's bench tips in "Bench Tips for Jewelry Making" on [Amazon](http://Amazon.com).

Dinosaur Chase

Trace fossils are different from other types of fossils in that they give some (limited) information about the activity of living prehistoric beings. They include any impression or other preserved sign of activity (for example, feeding, scratching, burrowing, walking, or resting). MAGS has visited the former Union Chapel Mine near Jasper, Alabama (now the Steven C. Minkin Paleozoic Footprint Site), one of the most important vertebrate trackways sites.

The Minkin site was preserved, and people can visit it today. Recent news reports concerned another site that no longer exists, but that paleontologists can still study due to the use of modern analytical techniques.

On a river bed in Bexar County, Texas, near San Antonio, one dinosaur was chasing another. Not recently, but 110 million years ago. The tracks they left behind were preserved. The tracks are from a large, herbivorous sauropod and a carnivorous theropod—the group of top predators to which *Tyrannosaurus rex* belonged.

"In some places the theropod tracks are in the sauropod tracks," said Dr. Peter Falkingham, the lead researcher in the work described here. "[This means] the

theropod came after. So the interpretation is a theropod chasing a sauropod."

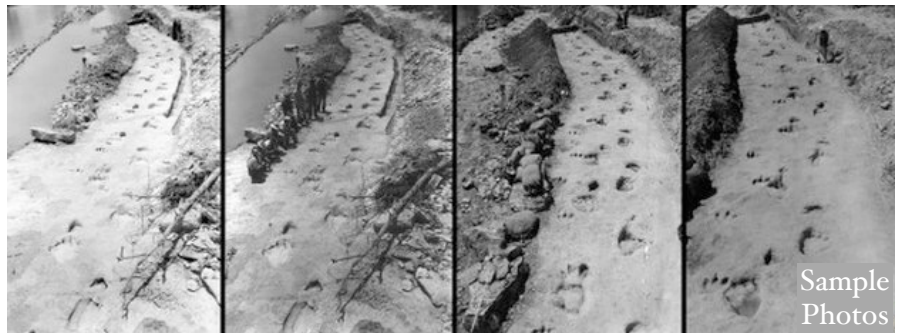
Seventy years ago, the whole trackway was removed from the river bed and divided into blocks, which were moved to different locations for study. Since then some of the blocks have been lost.

But American paleontologist Roland T. Bird, who first excavated the site in 1940, took photographs. Bird also drew maps of the whole site. Falkingham's team used a technique known as photogrammetry—scanning and combining the photographs—to build a digital model of the site. Photogrammetry finds the 3-dimensional coordinates of points in the photographs, building a mathematical model of the scene.

"We now have the whole trackway in context in a single piece," said Dr Falkingham. "Here we're showing that you can do this to lost or damaged specimens or even entire sites if you have photographs taken at the time.

"And that means we can reconstruct digitally, and 3D print, objects that no longer exist."

The reference below gives more detailed information. You can actually see a video of the model at Movie St. Fly through of the *Continued, P. 9*



Sample Photos



## UPCOMING MAGS FIELD TRIPS

Please note change in schedule for November 8 and 9. Let Field Trip Chair W. C. McDaniel know if you are interested in attending the November trip.

| Dates        | Location   | Trip status                             |
|--------------|--|---|
| October 11   | Memphis Stone & Gravel Co.<br>Anderson Mine  | Trip bulletin published and distributed |
| November 8/9 | <b>CHANGE IN SCHEDULE</b><br>two trips near Magnet Cove, Arkansas, both to private property <ul style="list-style-type: none"> <li>11/8—collect Novaculite and other minerals, fee \$0.55 per pound</li> <li>11/9—mineral site with large assortment including smoky quartz and brookite, fee \$20 for day, 9:00-4:00</li> </ul> | Trip bulletin to be published           |

*Dinosaur Chase* reconstructed  
*Continued from P. 8* trackway.

doi:10.1371/journal.pone.0093247.s001 (AVI)

**Ref:** Falkingham PL, Bates KT, Farlow JO (2014) Historical Photogrammetry: Bird's Paluxy River Dinosaur Chase Sequence Digitally Reconstructed as It Was prior to Excavation 70 Years Ago. PLoS ONE 9(4): e93247. doi:10.1371/journal.pone.0093247

### Big Scoop James Butchko



On Saturday, September 27, 2014, MAGS was invited to show off our Rock Food Table at the Big Scoop Ice Cream Festival at Autozone Park. This is a fundraising event for The Ronald McDonald House Charities of Memphis. There were all kinds of fun and games, free samples of ice cream and other treats. The MAGS Rocks Around the Clock game is always a favorite. Every player wins a polished rock. We snuck in some educational stuff too, like our hands on "touch me" display. The Rocks Around the Clock game's next appearance is at the October picnic at Shelby Farms.

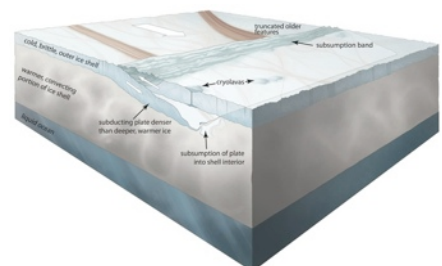
### Europa Tectonic Activity

Scientists have found evidence of plate tectonics on Jupiter's

moon Europa. This indicates the first sign of this type of surface-shifting geological activity on a world other than Earth. The NASA photo illustrates the subduction process taking place on Europa.

You can get more information from the NASA website at the link below.

[www.nasa.gov/press/2014/september/scientists-find-evidence-of-diving-tectonic-plates-on-jupiter-s-moon-europa/](http://www.nasa.gov/press/2014/september/scientists-find-evidence-of-diving-tectonic-plates-on-jupiter-s-moon-europa/)



## 2014 MAGS Show Benefits



The annual Memphis Mineral, Fossil, and Jewelry Show is our biggest fundraiser. The proceeds from the Show help to fund the club's operations. Also, a portion of the proceeds goes towards gifts to other worthwhile organizations.

The Board voted to contribute to the Ronald McDonald House

Charities of Memphis from the 2014 Show proceeds. The photo shows (MAGS President) Paul Sides and Nannett McDougal-Dykes presenting the check to a Ronald McDonald House representative.

The Board also voted to make a contribution this year to the C. H. Nash Museum at Chucalissa. In the past, we have also made contributions to educational organizations such as the Tennessee Earth Science Teachers (T. E. S. T), an organization for all K-12 teachers who have an interest in the Earth.

### Calendar

**October 2, 2014**

Board Meeting, St. Francis Hospital, 6:30 P. M.

**October 10, 2014**

Membership Meeting, Shady Grove Presbyterian Church, 7:30 P. M.

**October 11, 2014**

MAGS Field Trip, Memphis Stone & Gravel Co. Anderson Mine

**October 11, 2014**

DMC Field Trip, Taylorsville, Spencer County, Kentucky

**October 25, 2014**

MAGS Picnic/Rock Swap, Shelby Farms Park, 8:00 A. M.-1:00 P. M.

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Memphis Archaeological and Geological Society  
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