



Volume 61 ♦ Number 10 ♦ October 2015 ♦ A monthly newsletter for and by the members of MAGS

David and Solomon—Myths?

October Meeting Presentation by Dr. James Hardin

NEW MEETING TIME 7:00 PM



The Bible describes events and circumstances for which no, or very few, other written records are known. Literacy was not as widespread then as now, and what few contemporary documents existed may not have survived through the intervening centuries. So when

independent confirmation of any events (Biblical or otherwise) that occurred thousands of years ago is found, it is interesting and valuable to scholars—archaeologists and historians as well as experts on religion.

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TOOLS FOR SAFE ROCKHOUNDING

“Be Prepared” is always the key to success. Rock hunters should try to know what gear will be needed on any field trip, so that their experience will be safe, fun, and productive. The right tool for the job will keep you safe.

First, dressing properly is very important. Hot weather or cold, you should wear



clothes that are brightly colored. You should dress in layers, so you can add or subtract layers of clothing as the temperature changes. Your shoes should give your ankles great support. Walking boots are suggested; they give you better grip on slippery surfaces and keep you dry in wet conditions. Look for an article next month

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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

Change In Meeting Time

At the September Membership Meeting the Members present voted to change the normal meeting time to 7:00 P. M. instead of 7:30 P. M., as recommended by the Board of Directors. The change takes effect with the October 9 meeting.

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

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.

October DMC Field Trip

WHERE: Coon Creek Science Center, McNairy County, TN

WHEN: Saturday, October 3, 10:00 A. M.-2:00 P. M.

COLLECTING: Coon Creek (Upper Cretaceous) fossils

INFORMATION: Mike Mangrum, (615) 587-1733 or Mangrum1972@bellsouth.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

David and Solomon—Myths?
Continued from P. 1

Many modern scholars dismiss Kings David and Solomon as mythological figures and believe no kingdom could have existed in the region at the time the Bible recounted their activities. In a recent journal article, Dr. Hardin and colleagues described six bullae found at Khirbet Summeily, a site east of Gaza in southern Israel, in 2012 and 2014. They said these clay bullae were used to seal official correspondence in much the same way wax seals were used on official documents in later periods. The new finds provide evidence that some type of government activity was conducted there in that period.



The finds contribute significantly to an ongoing debate in the archaeological community about whether governments or states existed in the early Iron Ages. The artifacts hold far-reaching implications for the growing number of scholars who maintain that such political organization occurred much later than biblical texts suggest.

"Some text scholars and archaeologists have dismissed the historic reliability of the biblical text surrounding Kings David and Solomon, such as recorded in the

Bible in the books of Kings and Second Samuel, which scholars often date to the Iron Age IIA or 10th century B. C.," Hardin said.

"The fact that these bullae came off of sealed written documents shows that this site—located out on the periphery of pretty much everything—is integrated at a level far beyond subsistence," he said. "You have either political or administrative activities going on at a level well beyond those typical of a rural farmstead."

"Our preliminary results indicated that this site is integrated into a political entity that is typified by elite activities, suggesting that a state was already being formed in the 10th century B. C.," Hardin said. "We are very positive that these bullae are associated with the Iron Age IIA, which we date to the 10th century B. C., and which lends general support to the historical veracity of David and Solomon as recorded in the Hebrew biblical texts.

"These appear to be the only known examples of bullae from the 10th century, making this discovery unique," he said.

Dr. Hardin is an associate professor in the Mississippi State University Department of Anthropology and Middle Eastern Cultures, and a staff member at MSU's Cobb Institute of Archaeology.

Plastoglomerates from the Anthropocene?

Amber Dunn

You're walking along a beautiful beach in Hawaii and you see this interesting rock, so you pick it

up to take a closer look. It's rock hard and mostly dark in color, with hints of bright yellow, blue, a white sea shell or two and ... wait, is that a green toothbrush? So of course next you're wondering, am I holding a rock or a chunk of plastic? Well, maybe you don't have to choose anymore, maybe it's a Plastiglomerate!



That's right folks, there's a new geological wonder amongst us! Or should it be call an environmentalist's worst nightmare? Scientists have discovered these unusual creations off the shore of Hawaii in alarming numbers. They suspect the clumps are formed when plastics are melted by human campfires, but admit lava flows or forest fires near any source of abundant plastic debris could form them as well.

Basically the weakened plastic collects rock fragments, shells, coral, sand, or other plastics as it melts or even fills in cracks and holes on larger rocks conjoining the two into one solid lump. Sometimes the plastic's former recognizable shapes can even be seen, such as a tooth brush, bottle cap, fork, etc.

So do we really have a new rock on our hands? Scientists aren't really sure. *Continued, P. 4*

Plastoglomerates With the plastic molding into heavier things such as rock or coral, it has the potential to sink to the ocean bottom and over time be covered in sediment. You can imagine years from now scientists will be digging into the earth to date an artifact left from today and stumble across one. They will likely explain that it formed in the Anthropocene, or what some scientists are trying to name our new epoch in earth's history.



Of course this debate did not begin with the discovery of the *Plastoglomerates*. Scientists have given this name to the period where we humans have begun to reflect a dominant effect on the climate and the environment, basically our current geological age.

How long the plastic will remain and if it will in fact show up in our geological record is up for debate, truly. One scientist points out that with plastic normally melting at relatively low temperatures and given the processes most rocks have to go through within the earth to form, it is highly unlikely they will persist. While another argues they may revert back

to oil (one of plastic's key components).

Still other scientists believe that conclusion isn't true for all plastics. Some may be preserved as a thin carbon film just like a plant fossil forms, except in this case you might be left with the imprint of a plastic bottle.

So is it true, have we really altered the planet THAT much? Yes, but to what degree is still and may forever be up for debate. But this entire subject does make you wonder, so hopefully you'll delve into it more on your own. I just skimmed the surface!



Fabulous Tennessee Fossils

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

Pelmatozoans—Crinoids and Their Cousins

A few weekends ago I took my paleontology students to Mouse-tail Landing State Park in Perry County, just across the river from Parsons, Tennessee. Their task for the weekend was to scour the north ridge of the park looking for rock outcroppings and fossils, with the goal of being able to identify the fossil groups, determine the geologic formations in which the fossils were preserved, in what mode the fossils were preserved, and hopefully later in the course, identify the geologic ages of each of the strata. Trust me this is a tall order! Well, they do have the entire semester to finish the task. Three rattlesnake sightings, two scorpion sightings, one

grumpy opossum sighting, and an unimaginable number of spider-webs-in-the-face. Later, at the end of a hot day, the students returned to the campsite with the bountiful fossil booty (all collected with the permission of the park ranger... thanks Ranger John Bowen). Now it was time to identify the fossils. Textbooks and handouts soon covered the picnic tables all around our assigned sites on Sparks Ridge. Several trilobites (actually molts rather than the entire skeleton) were on display, along with two very well-preserved cephalopods and dozens of *Astraeospongia meniscus* (see "Fabulous Tennessee Fossils" in the *MAGS Rockhound News* 61(4) from this year).

As I wandered among the working groups listening to their discussions and debates over identification and mode of preservation, and recounting their "near death" experiences with the snakes and spiders, I kept hearing the phrase "crinoid stem" being used. "Dr. Gibson the educator" switched into gear as I realized this was time to correct a common identification issue with students and collectors regarding the stems of these particular fossil echinoderms, which are so abundant in Tennessee.

Crinoids, or sea lilies, are popular with collectors, especially when they are complete specimens, or at least preserve the "head" region (called a calyx). Crinoid parts are abundant in the limestones of Tennessee, especially in the Valley and Ridge and Central Basin regions. They belong to the Phylum Echi-

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Fabulous Tennessee Fossils
Continued from P. 4

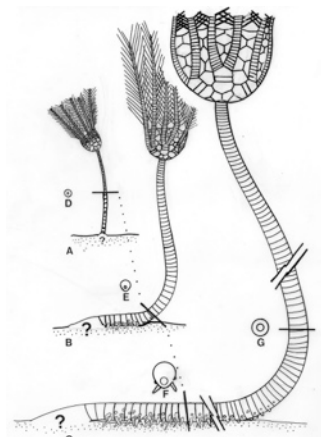


Figure 1. Cartoon of a typical stalked echinoderm (drawn by Michael Gibson, 1986). Notice the stem is composed of individual “Life Saver” shaped disks (called “ossicles”) and that segments would resemble macaroni. Upon decay these stems disarticulate to produce sediment made up of the individual ossicles.

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nodermata, so are related in basic body form to sand dollars, sea biscuits, and starfish. Crinoids are also related to several other extinct echinoderm groups, such as blastoids, like *Pentremites* (see “Fabulous Tennessee Fossils” in *MAGS Rockhound News*, 61(6) from this year). What makes crinoids and blastoids unique from other echinoderms? The primary feature visible to collecting, with implications to paleoecology, is that crinoids and blastoids are “stalked echinoderms” (Figure 1). Rather than being mobile like the crawling starfish or the burrowing sand dollar, stalked echinoderms have a root system to anchor the sediment, and a stem of circular plates, that acts much like the trunk of a tree, that supports a crown or



Figure 2. Examples of individual stalked echinoderm ossicles and segments that compose the stems. Termed “pelmatozoans”, these skeletal features are single crystals of calcite, but are usually more difficult to determine as belonging to specific groups such as crinoid, blastoid, or another group of echinoderm when the identification is based upon the stem piece alone (Photo by Michael Gibson using specimens from UT Martin Vanderbilt Fossil Collection).

.....
head (calyx) with arms for gathering food. Consequently this group of echinoderms evolutionarily sacrificed mobility for stability and the ability to rise above the seafloor. What these groups share is their gregarious nature (“gardens”) and the stalked stem, which can disintegrate upon death in to individual plates that resemble little “Life Savers” candy or short lengths of stem that look like macaroni. This is also what some folks call “Indian money”. Paleontologists have a special word for the stalked members of the echinoderm phylum...we call them “***pelmatozoans***”, from “*pelma-*”, meaning “stalk”, and “*-zoan*” referring to being an animal. Now for the important science lesson of the day ... once the pelmatozoan echinoderms (crinoids and blastoids especially) die and disintegrate, it is usually not possible to easily and readily identify which

stalked group contributed the stems pieces without extensive study of the fauna and matching stems to their crowns. Consequently it is better to call disarticulated stem-bearing organisms, represented by only parts, by their anatomical name of “pelmatozoans”, rather than a possible (hopeful?) taxonomic name when the necessary identifying features are not present. So, those little “macaroni Life Saver” fossils *might* be crinoid, *might* be blastoid, or *might* be other stalked echinoderm, but they are certainly ***pelmatozoans!***

Jewelry Bench Tips by
Brad Smith

DEBURRING A HOLE

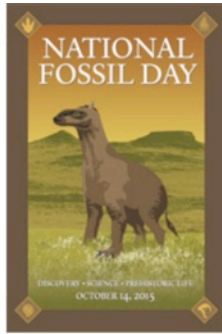
When you drill a hole, there's usually a burr produced on the underside of the metal. Typically, burrs are removed by filing or sanding the area smooth, but doing it this way will put scratches on your piece that will have to be polished off.



A quick way to remove the burr is to grab a drill that's two or three times larger than your hole. Simply twist it in the hole to cut off the burr. I usually do this twisting by hand, but if you have many holes to do, it's easier on your fingers to put the drill into a holder like a pin vise.

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National Fossil Day Events



National Fossil Day at the Gray Fossil Site
October 10, 2015
10:00 a.m. to 3:00 p.m.

Visitors are invited to interact with paleontologists and participate in all-ages activities at the East Tennessee State University and General Shale Natural History Museum at the Gray Fossil Site on Saturday, October 10th for National Fossil Day.

From 10:00 a.m. - 3:00 p.m., the museum will offer a variety of activities for all ages. Visitors can learn about different types of fossils found at the Gray Fossil Site and learn how fossils are processed.

Dr. Mick Whitelaw will present his talk
"Trilobites: Sovereigns of the Seas"
October 10, 2015
3:00 p.m. to 4:00 p.m.

Dr. Whitelaw will talk about trilobite evolution, classification and ecology. Trilobites are an amazing and highly successful group of marine animals. Over 22,000 species are currently recognized from pin-head sized forms to two foot long monsters.

Thanks to Teresa Polly, SFMS Second Vice President, for providing this information.

Tools for Safe Rockboulding Continued from P. 1

about safety eyewear.



Make sure you have sufficient water even in cold weather. You need to keep hydrated. Snacks are a good idea, too. Most of these things are just common sense, but sometimes people don't plan ahead.

Next, what type of tools do I need to bring? Of course, that depends on where you are going and what you plan to collect. Most amateur rockhounds own a "rock hammer." But the two tools that are recommended most often are an Estwing



prybar and a crack hammer. You might also like to have a chisel. Again, the size of the chisel will depend on the type of matrix you are trying to remove.

If you are collecting crystals you will want to bring a long screwdriver, a long chisel, and an ice pick. Make sure your steel tools go through the handle so you can hammer without breaking the handle.

If you are digging in a quarry you might need a hard hat and steel toed shoes. The right type of bag or bucket for carrying your supplies and trophies should also be considered. Do you want a backpack or a bucket? What is

Trilobite Treasures: Arthropods of the Ancient Seas
July 25th thru November 11th
Admission for Adults is \$5.00 and Children are Free



East Tennessee State University and General Shale Natural History Museum and Gray Fossil Site will present Trilobite Treasures: Arthropods of the Ancient Seas, an exhibition featuring more than 200 actual Trilobite specimens and Trilobite artifacts. The exhibit will open on Saturday, July 25th and run through Wednesday, November 11th.

The featured Trilobites range in age from 550 million years ago to about 320 million years ago. These ancient sea creatures lived, thrived and became extinct – long before the age of Dinosaurs. The Trilobites are actual specimens from the ancient Paleozoic period.

Trilobite Treasures: Arthropods of the Ancient Seas will present prepared specimens, original artworks, items of trilobite jewelry and assorted artifacts highlighting the fascination of these fossils in the United States and around the world. Trilobite Treasures: Arthropods of the Ancient Seas is arranged in a way to tell the story of Trilobite discovery, history, research and preparation of these ancient fossils.

The exhibit contains fossils from the Middle Cambrian period some 530 Million years ago to the Mississippian Period of about 320 Million years ago. The exhibit discusses by way of actual specimens, text panels and hands on discovery the trilobite fossils of the world and the United States. Once these creatures actually crawled along the large inland sea that once covered what is now the state of Michigan. Actual preparation tools and techniques will be on display along with various unique artifacts from around the world.

The museum is located 1.8 miles off Exit 13 on Interstate 26. For more information, call (866) 202-6223 or visit the museum at www.etsu.edu/naturalhistorymuseum.

#ETSU Fossil
Contact Information:
Name: ETSU Natural History Museum
Phone: (423) 439-3659
Email: grayfossilmuseum@etsu.edu



easiest for you is a personal choice. Just make sure that whatever you use, it needs to be strong enough to carry all your stuff.

Normally, your field trip leader will give you all the info on any special tools or supplies you might need. But you are responsible for everything you carry—your tools and everything you collect. Think safety first.

Jewelry Bench Tips
Continued from P. 5

CLEANING STEEL SHOT

Steel shot in a vibratory or rotary tumbler works great to burnish and shine your finished silver pieces. But a common problem is how keep the shot clean. Carbon steel shot can get rusty if exposed to the air, and even stainless steel shot can sometimes develop a blackish coating that's hard to remove.

My solution of choice to clean the shot is Classic Coke. Just pour an ounce or two over the shot and let the tumbler run for an hour or so. A bad case might require a second cleaning. Some folks like to let the bubbles in the Coke dissipate before using it so that gas pressure doesn't build up in the tumbler barrel. I've heard that it's the phosphoric acid in Coke that does the trick.

While you're waiting for the shot to clean up, just settle back and enjoy the rest of the Coke.

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

Upcoming Field Trips

Charles Hill

Well, the trip to Halle Stadium was a great success. We had members from two clubs and lots of them. I believe everyone found goodies. I was busy, and I found a few things. Some are cuttable, some will polish well, and some will be yard rock. I put others in the grab bag bucket, which isn't getting enough attention, by the way. Thank you all for coming; I

love it when we have great turnouts. See pictures on P. 9.

Now, what's next? The schedule I last posted in the newsletter has been torpedoed and sunk by more recent events. Two field trips popped up in October. One is a Dixie Mineral Council trip to Coon Creek, and the other is a North Mississippi Gem and Mineral Society trip to Parsons. So here is the new schedule. I hope nothing else changes.

Saturday, October 3, 2015, from 10 A. M. to 2 P. M. CST, Coon Creek Science Center, McNairy County, Tennessee, FEE \$15—Limited to 35 participants. As announced at the last Membership Meeting, the Coon Creek trip is close to being full; so if you have not registered, you need to do so quickly.

Saturday October 24th, 6 A. M. to 12 P. M. CST, Vulcan Material Quarry-Parsons Tennessee, Fee None—Limited to 25 participants. The Vulcan Quarry field trip is well over-full; we have people on standby.

Saturday, November 14th, 10 A. M. to 5 P. M. CST, Richardson Landing, Drummonds Tennessee, Fee None—Limits on participants: None.

The trip coming up in November will be led by Assistant Field Trip Director Kim Hill. We will be going someplace close—Richardson Landing. The water should have receded by then. At Richardson Landing you can find almost anything in the way of minerals. The Mississippi is a powerful river. It churns up and

washes down all manner of material from the northern part of this country. The mighty river is also fed by other great rivers from the northwest and the northeast. Rocks and minerals from many states wash up along the Mississippi, so you can find almost anything. When we last went, we found a good piece of Lake Superior Agate.

When I get to a stopping place I will make the calls and do the leg work for December and the first few months of 2016. Thanks for your patience and understanding concerning the juggling of trips around. We will be going to Jonesboro, Arkansas; Potosi, Missouri; the Ledbetter Farm in Middle Tennessee; a secret place in Arkansas; and, of course, Coleman's Crystal Mine for quartz. I hope to see you out there!

Charles

August Board Minutes

Mike Baldwin

Meeting called to order at 6:34 pm. Present: Paul Sides, Charles Hill, Nannett McDougal-Dykes, Marc Mueller, Mike Baldwin, W. C. McDaniel, Kim Hill, Carol Lybanon, Matthew Lybanon, Bob Cooper, and Bonnie Cooper. W. C. will not be at the August Membership Meeting. Junior assistant and field trip assistant positions are vacant.

Secretary Report: July minutes distributed via email before the meeting by Mike. Board approved minutes with one minor correction.

Treasurer Report: May and June checking and savings summaries were distributed by Bonnie. Board approved financial report subject to audit.

Continued, P. 8

MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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

August Board Minutes *Continued from P; 7*

Membership: Bob received application [with payment] for one new member. Paul asked if we need to adjust the way we accept dues. Discussion followed with unanimous opinion that our current dues and payment structure is fine.

Field Trips: Charles received a letter from North Mississippi Gem and Mineral Society [NMGMS] inviting MAGS to consider a joint field trip sponsored by Memphis Stone and Gravel. Field trips through April are set [except February]: Jonesboro in October; DMC trip to Memphis Stone and Gravel quarry; Ledbetter Farm in November; Missouri in December; and Crowley's Ridge in March. W. C. stated that we will be doing a trip to a Memphis Stone and Gravel location in 2016.

Adult Programs: Lori Carter will be here in September with a program on sand. Jimmy Hardin in October. November fluorescent program will be by Mike Baldwin, Bob Cooper, and Alan Schaeffer. \$100 each will be awarded to Lori and Jimmy as a stipend for travel expenses.

Junior Programs: November will be a good opportunity for the juniors to join the adults for the fluorescent program.

Rock Swaps: August rock swap and picnic is all set. Door prizes have been collected. Everything is covered. Matthew will be sending another blurb out to the members on Wednesday reminding them of the picnic and what they need to bring. Setup will include a silent auction table or a live auction if Lou White or Alan Parks are coming to the picnic. The fall rock swap will be a cement pour at W. C.'s house on October 24 beginning at 9:00 am.

Library: W. C. welcomed Marc Mueller as the new librarian. *Under-*

standing Earth book has been added to the library.

Web: Newsletters have been printed and are ready to mail.

Newsletter: Bob Williams sent in an article about free online courses. Matthew found free online MIT "Geology 101" course. Matthew would like someone to read the textbook and write a review. Send safety articles and other materials for the next newsletter.

Show: Currently MAGS has \$13,500.00 in the show account. We could talk to the Agricenter about paying the 2017 down payment at current rent prices to lock in fees. A discussion about the eventual rise in rent and expenses followed. A motion was made that we keep \$9500 in show fund and present \$4036 to the club. A motion was made that MAGS donate \$500 to Ronald McDonald House from the club account. A discussion about donations to Chucalissa Indian Village and Tennessee Earth Science Teachers [TEST] followed. A motion to donate \$1500 to Chucalissa failed. A motion to donate \$1000 to Chucalissa carried.

Old Business: Secretary read the proposed bylaws changes. A motion that we leave the original wording in Section III: A carried. A motion to accept the bylaws changes with the above change to Section III: A carried.

New Business: [01] Melba Cole suggested that we move our meeting time from 7:30 pm to 6:30 pm. A motion that the board recommend we start meeting at 7:00 pm instead of 7:30 pm carried. [02] W. C. would like to develop a more structured way of presenting programs to the community. [03] The Girl Scouts have requested that MAGS be involved in their spring camporee. A broader discussion about MAGS' future involvement with Girl Scouts and Boy Scouts followed. [04] James Johnson has do-

nated several buckets of material to the club. [05] Ron Brister would like to create a display case for pottery sherds. [06] Are we eligible for federal grants? According to the notebook put together by Neville Mayfield after he attended a grant seminar several years ago, we are.

Meeting adjourned at 8:01 pm.

August Meeting Minutes

Mike Baldwin

Meeting called to order by Charles Hill, First Vice President, at 7:30 pm. Bob Cooper introduced 11 visitors. 33 members present.

Charles recapped upcoming field trips, including 20-Mile Creek trip set for August 15. Mike Baldwin distributed copies of the proposed bylaws changes to all Members present. Mike deferred reading of the proposed changes, asked Members to review the changes, and informed the membership that the final reading and vote will take place at the September membership meeting.

Carol Lybanon announced that Kim Hill will be moving from Director-Assistant Programs to Director-Assistant

Field Trips. Carol also announced the appointment of Marc Mueller as Librarian.

Charles adjourned the business portion of tonight's meeting at 7:40pm, followed by potluck dinner and fellowship. During dinner, raffle tickets were issued to those members interested in the "Singing Bowl".

October Birthdays

- 1 Dave Shiffman
Wayne Gitter
- 2 Christina Lagerson
- 4 Patsy Black
Katherine Kitzmann
- 5 Michala Demo

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MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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

October Birthdays

Continued from P. 8

- Matthew Lybanon
- 7 Alan Jacobs
- Chris Vaughn
- 8 James Fair
- 9 Charles Hill
- 10 Jan Gish
- 11 John Erickson
- 13 Michael Baldwin
- 20 Beto Ortiz
- 21 Tabitha Lambert
- 24 Cheryl Abel
- Ann Austin
- 29 Bill Dean
- 30 Marian Klug

Earthquakes In Unusual Places

It has long been a mystery why some earthquakes strike towns in seemingly earthquake-proof regions. Memphis is in the New Madrid Seismic Zone, which is not

at a boundary between two plates. Yet four of the largest North American earthquakes in recorded history occurred there in 1811-1812. Understanding the causes of intraplate earthquakes is challenging, as it requires extending plate tectonic theory to the dynamics of continental deformation.

A recent article published online in *Nature* offers a potential explanation: active mantle flow. Researchers found that intraplate earthquakes are influenced by convection of the molten mantle beneath the Earth's cold, solid crust. For their study, the researchers specifically looked at intraplate seismicity along the Intermountain Region, which runs north to south in the western United States. The Intermountain Region covers nearly 137,000 square kilometers of federal land and includes 13 National Forests. It also encompasses four major geographic provinces: the Great

Basin, the Colorado Plateau, the Middle Rocky Mountains, and the Northern Rocky Mountains.

The researchers compared seismicity along the Intermountain Region to data collected by seismometers across the North American Plate, to see how the Earth's surface deforms when earthquakes occur at plate boundaries and when temblors strike within plates. They found that earthquakes away from plate boundaries appear to occur when the mantle pushes up or down on the surface from below. Changes in the Earth's surface generated by mantle convection—specifically, mantle upwelling—contributed to intraplate earthquakes, according to the study.

Ref: Thorsten W. Becker et al, Western US intermountain seismicity caused by changes in upper mantle flow, *Nature* 524, 458-461 (27 August 2015) doi:10.1038/nature14867

NEW MEETING TIME 7:00 PM

September 12 Nonconnah Creek Field Trip Pictures



Big gravel bars



Great weather




Cooling off in the shade



Photo credits: Fred Solang and Matthew Lybanon

MAGS At A Glance

October 2015

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
27	28	29	30	1	2	3
				Board Meeting, 6:30 pm, St. Francis Hospital		DMC Field Trip, Coon Creek Science Center, 10:00 am
4	5	6	7	8	9	10
					Membership Meeting, 7:00 pm, "David and Solomon – Myths?"	National Fossil Day
11	12	13	14	15	16	17
NEW MEETING TIME 7:00 PM						
			21	22	23	24
						MAGS Field Trip, Vulcan Quarry, 6:00 am-noon
25	26	27	28	29	30	31
						

Memphis Archaeological and Geological Society
 2019 Littlemore Drive
 Memphis, TN 38016

