



Volume 65 ♦ Number 09 ♦ September 2019 ♦ A monthly newsletter for and by the members of MAGS

September Program

Scyphocrinites loboliths from the early Devonian Ross Formation in Hardin County, Tennessee Dr. Elizabeth Rhenberg, U. Memphis



A tributary of Horse Creek. The lower layers are the Birdsong Shale, where the loboliths are found.

During the Early Devonian, West Tennessee was covered by a shallow sea. While covered, the Ross Formation was deposited on this shallow, marine shelf. The Ross Formation is divided into two members: Rockhouse Limestone Member and Birdsong Shale

Member. The fossils that we are concerned with are found in the Birdsong.

Scyphocrinites is a genus of crinoids that are famously known for their good preservation in Morocco. Rock shops and gem shows often have several *Continued, P. 3*

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OCTOBER DMC FIELD TRIP

MAGS will host the October 2019 DMC Field Trip, to the Memphis Stone & Gravel Co. Perry Plant on Saturday, October 12. We will collect gravel from stockpiles. Expect to find chert gravels with fossils (Mississippian, Devonian, and Silurian), petrified wood, agate, conglomerate, quartz, and other rocks and

minerals associated with regional alluvial terrace deposits of Pleistocene/Pliocene age.



Memphis Archaeological and Geological Society

Members of other clubs from all over the Southeast Region will be there, so let's have a good MAGS turnout. More details will be available in the October issue of *MAGS Rockhound News*.

MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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

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MAGS AND FEDERATION NOTES

Memphis Archaeological and Geological Society,
Memphis, Tennessee

The objectives of this society shall be as set out in the Charter of Incorporation issued by the State of Tennessee on September 29, 1958, as follows: for the purpose of promoting an active interest in the geological finds and data by scientific methods; to offer possible assistance to any archaeologist or geologist in the general area covered by the work and purposes of this society; to discourage commercialization of archaeology and work to its elimination and to assist in the younger members of the society; to publicize and create further public interest in the archaeological and geological field in the general area of the Mid-South and conduct means of displaying, publishing and conducting public forums for scientific and educational purposes.

MAGS General Membership Meetings and MAGS Youth Meetings are held at 7:00 P. M. on the second Friday of every month, year round. The meetings are held in the Fellowship Hall of Shady Grove Presbyterian Church, 5530 Shady Grove Road, Memphis, Tennessee.

MAGS Website: memphisgeology.org

MAGS Show Website: www.theearthwideopen.com

We aren't kidding when we say this is a newsletter for and by the members of MAGS. An article with a byline was written by a MAGS Member, unless explicitly stated otherwise. If there is no byline, the article was written or compiled by the Editor. Please contribute articles or pictures on any subject of interest to rockhounds. If it interests you it probably interests others. The 15th of the month is the deadline for next month's issue. Send material to lybanon@earthlink.net.

September DMC Field Trip

WHERE: Summerville, GA (quarry)

WHEN: Sunday, September 22, 9:00 A. M.

COLLECTING: Lace banded chert/agate

CONTACT: Dori Madden, (706) 767-5759 or Bob Madden, (706) 853-1748

Links to Federation News

- ➔ AFMS: www.amfed.org/afms_news.htm
- ➔ SFMS: www.amfed.org/sfms/
- ➔ DMC: www.amfed.org/sfms/dmc/dmc.htm

September Program for sale. These Continued from P. 1 specimens, however, are only of the crinoid crowns, where all the major functions of life occur. The specimens that are found in Hardin County, Tennessee, are of the loboliths, which are their unique form of holdfast (often thought of as the roots). The lobolith has long been a source of mystery for paleontologists. They have been interpreted a being a variety of things, including other echinoderms, cysts, and brood pouches. They were even given their own genus *Camerocrinus*. Today they are known to be holdfasts but the current mystery is how they were used. The competing hypotheses are: they allow the crinoid to float (the inner chambers would have been hollow in life) or they were just a specialized holdfast to allow for living on more muddy bottoms.



Two loboliths from Horse Creek showing different forms of preservation. The larger is calcite recrystallisation and the smaller has chert nodules and threading.

During my talk, I'll explore the overall environment these loboliths are found in. I'll also discuss the merits of each of the hypotheses and which is more accepted currently.



October 19th Fall Picnic at Freeman Smith Pavilion, 11:00-3:00. Map will be in the October issue.

Cleaning Quartz

Danny Baker

On a recent trip to Stafford Springs, Connecticut, Danny Baker was reminded of the importance of good shoes when rock hunting.



A quick way to clean your quartz crystals is to soak in a covered plastic bucket with 100 percent muriatic acid. David McAlister has done it this way up to 2 weeks straight with no damage to the quartz. It only took me a few hours to 24 hours of soaking.



Then, wearing a chemical mask and rubber gloves, spray off with water and put in a bucket with a box of baking soda and water. After a few hours, put in a bucket with water and a squirt of Dawn dish soap for 24 hours to help remove some of the acid yellow color on the rock.



Web Tips

- Tennessee Minerals—Rockhounding for Agates, Calcite, & Fluorite. Where to dig for a variety of Tennessee minerals <http://raregoldnuggets.com/?p=3783>
- Nonconnah Creek Conservancy monitors man-made changes to Nonconnah Creek. https://dailymemphian.com/section/metrocity-of-memphis/article/6173/when-a-creek-becomes-a-river?utm_source=email_edition&utm_medium=email&utm_campaign=morning_2019-08-05&fbclid=IwAR3iVIWuE91-IW1Q_JeJbsQoaNPM1x-iVnnqWg4w3Mkd-tYuQ77mZKB-VMnak
- Digital Atlas of Ancient Life project, to help you identify fossils from particular regions and time periods. <https://www.digitalatlasofancientlife.org>

MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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

We offer sincere condolences to the family of Robert Connolly, who died on August 20. Former MAGS Member Dr. Robert Connolly retired a few years ago from the University of Memphis, where he was Director of the C. H. Nash Museum at Chucalissa and an Associate Professor in the Department of Anthropology and Department of Earth Sciences. Robert was an active MAGS Member who presented several programs at our meetings. We've lost a good friend.

Metal Art Glass

Thanks to Aaron Jones and Kathy Baker for these pictures of the August 10 Metal Art Glass class at the Art Academy.



Are Fossils Minerals?

Matthew Lybanon, Editor

Why should MAGSters and other rockhounds in this part of the country care about a lawsuit in Montana?

In *Murray v. BEJ Minerals, LLC*, No. 1:14-cv-00106-SPW, a panel of the US 9th Circuit Court of Appeals ruled on a fight over fossils of two “dueling dinosaurs”, a 22-foot-long theropod and a 28-foot-long ceratopsian, “engaged in

mortal combat” when “entombed under a pile of sandstone.” The surface owner and mineral owners then became involved in a fight over the ownership of these fossils, as well as several other fossils found on the property. Pointing out that “oil, gas and coal all derive from the remains of plants and animals,” the mineral owner argued that the fossils are “minerals.” The court agreed with the mineral owner, citing a Montana Supreme Court case, which in

turn adopted a definition from a Texas Supreme Court Case.

The lawsuit, now at the Montana Supreme Court, concerns who owns some of the greatest fossil finds in the last century, including the two dueling dinosaurs. They are worth millions, and paleontologists say the 9th Circuit Court of Appeals ruling would have “fundamental and extraordinary impacts upon the conduct of science concerning the history *Continued, P. 5*

Are Fossils Minerals? of life on Earth." *Continued from P. 4*

The case hinges on a seemingly straightforward question: Are fossils considered "minerals" under Montana state law?

In Montana, rights to a property's mineral estate are often severed from its surface rights. Historically, fossils have been considered part of the surface estate. That all seemed to change last November because of the 9th U.S. Circuit Court of Appeals ruling. It would make searching for fossils extremely complicated, said David Polly, a former president of the Society of Vertebrate Paleontology, based in Bethesda, Maryland, because paleontologists would need to navigate both surface ownership—to get to the dig location—and mineral ownership of a parcel. Often, mineral rights are hard to find and frequently change hands between large corporations.

More alarmingly, Polly said, it could raise questions about the ownership of fossils currently in museums.

Polly's group convinced the San Francisco-based 9th Circuit to refer the case to the Montana Supreme Court, where it will be taken up later this year. The court predicted that the Montana Supreme Court would hold that the fossils "are rare and exceptional in character" and "possess a peculiar property giving them special value," and are therefore "minerals." In April, Montana enacted a law that states "fossils are not minerals and that fossils belong to the surface estate." The law, however, does not apply to existing

disputes, though the "Dueling Dinosaurs" case is likely the only existing matter of its kind.

Fossil hunters are waiting for the Montana Supreme Court to decide a case that could affect fossil hunting, by both amateurs and professionals, nationwide.



Field Trip Report— Parkin Museum

Kim Hill

The day dawned **hot**. We climbed into our cars cranked up the A/C, and headed to Parkin, Arkansas, to visit The Parkin Archeological Park. A small but enthusiastic group of us met at the Visitor Center and museum.

We started our tour with a short movie about the different lives of the park, from when the Mississippian Indians lived there—a culture that lived 500 years ago—to the time it was a sawmill and was studied to learn more about the site's history.

Being the rockhounds we are there were lots of questions, and our guide, Ryan Smith, Park Interpreter answered them all and



filled us in on many aspects of the site. He is full of all kinds of information about the park and ways the Mississippians lived.

The museum is small but well laid out, with lots of artifacts to see and plenty of additional information.

After touring the museum we took the trail around the site. It's about 3/4 of a mile. There were placards placed around explaining a particular spot and Ryan explained things further, even showing us plants growing in the park that were used as dyes by the people that lived there.

This is where you use the information from the movie, Ryan, the museum and your imagination to see the site as it was when the Mississippians lived there.

About halfway around the trail we were asked if we wanted to see the restored school house that was used in the forties. The actual question was, "Would you like to see the 'air conditioned' school house?"

To which we all quickly agreed it would be fun, informative, 😊... and cool! Again, Ryan had plenty of information and answers to our questions.

We finished up at the gift shop back at the museum *Continued, P. 6*

Field Trip Report , several of us finding something we liked. My husband even found some polished agates
Continued from P. 5 he liked; that's another story. I bought a Lake Superior agate necklace and a couple other items ... 'cause you know, I needed them. I need them for my September Juniors program.



While paying for our selections some of us decided to go to lunch and we drove into Marion to eat. We enjoyed a good lunch and the camaraderie of fellow rock hounders topping off another fun MAGS field trip.

If you aren't going on our field trips you are missing out on adventure , learning ,or being able to actually collect your own specimens.

So come join us!

Get Up, Get Out, Hunt Rocks

Kim Hill

Field Trip Director

Fabulous Tennessee Fossils

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

FTF 56

Dalmanites retusus



What groups remain in our centennial tour of Carl Dunbar's 1919-1920 publications of new species of fossils from the Lower Devonian of West Tennessee? So far, we have looked at the corals and echinoderms that he named. Now we arrive at those groups that are much more abundant and diverse in the Ross Formation fauna, so the number of new species described goes up several fold. Three groups remain: brachiopods, gastropods, and arthropods, for a total of 36 new species! At this point, I will have to make some choices on which to discuss, otherwise, it will be 36 more essays to finish this centennial. Dunbar recognized two new trilobite taxa, and because trilobites are favorites of collectors, and extinct, let's look at these taxa.

Trilobites are relatively common to find in the Ross Formation, although rarely are they found complete and articulated.

Usually we find the "tail", or pygidium, separated from the other two skeletal parts, the thorax (body with legs) and cephalon (head). This is because trilobites belong to the arthropods ("jointed foot") invertebrates and, like the modern crab, periodically shed their external shells, so that they could grow larger in a spurt of growth, and then secrete a new skeleton. This process is cold molting or ecdysis. In the "softshell" form, the animal could add new segments as it grew. So, collectors generally find these discarded skeletal segments. In a side note, many people think that the trilobite gets its name from the three parts I named above (cephalon, thorax, pygidium), but this is not so. The three part in the "tri-lobite" are vertically oriented with a right, left, and middle lobes within each of the molted segments (Figure 1).

Dunbar listed two new species of trilobite in his 1919 Bulletin

that were new to paleontology: *Dalmanites retusus* and *Dalmanites purduei*. He also listed these species in a paper in the 1918 46th volume of the *American Journal of Science*. As with the previous taxa, he did not publish official taxonomic descriptions until the following year in the Connecticut Academy of Sciences. One of the most common trilobite remains to find in the Ross occurs in the upper Birdsong Shale—Dunbar's *Dalmanites retusus* (Figure 2), which is only known from molts of the pygidia. The species epithet "*retusus*" refers to the overall shape of the pygidium, which is well-rounded, or "blunt", to the point of being semi-elliptical, and lacks a terminal spine. The pygidium has 13-15 fused segments, which make this trilobite part resistant to breakage, so one reason we only see pygidia is due to a combination of growth dynamics and taphonomy. There *Continued, P. 7*

Fabulous Tennessee Fossils is some controversy surrounding this taxon for paleontologists.

First, most of the more important defining characteristics of trilobite species are associated with the cephalon, which is unknown for this species. No one has found a complete specimen of *D. retusus* in the past 100 years. Yes, cephalons are found in the Birdsong, but as they are molts, it is uncertain whether or not they belong to *D. retusus* or to the other species (which we will look at in the next article).

The second issue surrounding this taxon is the same issue that we have seen with Dunbar's earlier taxa, namely, that he did not formally describe them until after he published their existence in his earlier papers. What this means is that *Dalmanites retusus*, and technically the previously discussed taxa, are considered "nomen nudum", or "naked name". A *nomen nudum* occurs when a the binomial name that was coined looks to be a valid scientific name, and usually was published with the intent that it was to be the official scientific name, but fails to be valid because it was not properly published with an adequate description prior to the name being listing in the literature. Remember that scientific names for organisms must follow the rules set forth by Carl von Linnaeus in the International Code of Zoological Nomenclature published in 1758. Hence, until formally described following the rules, the name is considered "bare" or "naked", and should not be accepted as it stands. The name *Dalmanites retusus*, remained in the literature without much comment until 1998, when Tim White at Yale and Bruce Lieberman at Harvard published an article on type specimens at Yale in which they point out the issue. *D. retusus* does not actually appear in any other taxonomic descriptions (although it does appear in listings of taxa in surrounding states up until the 1970s). So, if the name is considered "invalid", why does it remain in use? Primarily it is because Dunbar did actually publish a description, even though it was after the fact, and because nobody has found another taxon that the pygidium could belong to.

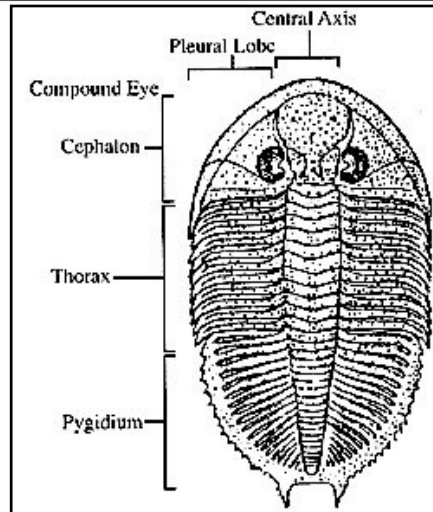


Figure 1. Sketch of a trilobite showing the three lobes that give the group its name (one central axis sandwiched between two pleural lobes) and the three basic parts of a molt (cephalon, thorax, pygidium).



Figure 2. Inner surfaces of two pygidia of *Dalmanites retusus* from the UT Martin collection. Each black & white block 1 cm in length (photo by Michael Gibson).

Jewelry Bench Tips by Brad Smith

FOREDOM STAND

A quick and easy way to suspend a flexshaft over your jewelry bench is to use some steel pipe components from the hardware store. You can buy it today, attaches with a couple screws, and only costs about \$10.

I use 1/2 inch galvanized pipe and fittings. To build a stand that attaches to the top of your bench, all you'll need is a flange and a thirty inch length of the pipe. If you prefer a stand that attaches *Continued, P. 8*

MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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Jewelry Bench Tips to the side of
Continued from P. 7 your bench,
you'll need a
little longer pipe, three foot, a
flange, and a 90 degree "street
elle".

Finally, make a hook that goes
into the top of the pipe to hang
the motor from. You can use heavy
coat hanger wire or 1/8 steel rod
from the hardware store.



BROKEN DRILLS

Have you ever broken a drill
bit off in a hole? Sometimes you
can grab it with pliers, but other
times the steel piece is below the
surface in the hole. If this hap-
pens, a quick fix is to dissolve the
steel in a solution of alum or fresh
pickle. The solution will not affect
your silver or gold piece.

Alum is typically available
from a food store. It's used to pre-

serve some foods. Use about a ta-
blespoon per cup of warm water.
Submerge your piece so that the
partially drilled hole is facing up to
let the bubbles float free and not
block the hole.

Work Smarter & Be More
Productive With Brad's "How To"
Jewelry Books

amazon.com/author/bradfordsmith



Adult Programs

September: Dr. Elizabeth Rhenberg,
"Crinoids"

October: Bill Prior, "Sinkhole In
Arkansas"

November: Michael Gibson,
"Vulcan Quarry"

Junior Programs

September: Kim Hill, "Native
American Lore and Artifacts"

October: W. C. McDaniel,
"Everyday Uses of Minerals"

November: Mike Baldwin, "Who
Are the Native Americans and
Where Did They Come From?"

Field Trips

September 27-29: Geode Fest,
Illinois

October 12: DMC Field Trip
(MAGS-Sponsored), Memphis
Stone & Gravel Co.

November: Vulcan Quarry (Parsons)

September Birthdays

- 1 Debbie Greusel
Frank Pinner
- 2 Eric Marbury
- 5 Leo Koulogianes
Emily Fox-Hill
Richard Hill
- 10 Alishia Parks
- 11 Boo Sessions
- 13 Sarah Stout
- 14 Christian McGhan
Jane Coop
Lisa Goossens
- 16 Bella Smith
- 17 Jeremy Bowen
- 18 Katherine Dean
- 19 Shirley Hawkins
Karen Schaeffer
- 22 Dominik Suarez
- 23 Park Noyes
Mildred Schiff
- 26 Raymond Carnahan
Lucia Clarke
- 27 Shane Ashurst
Danny Whisnant
- 28 Elmer Stout
Bonnie Cooper
- 29 Gunnar Wallace

New Member

Darrell Criswell

Want to Be a Member?

To become a MAGS Member,
just go to our website at
www.memphisgeology.org and print
out an application form. There is a
prorated fee schedule for new
Members only. Mail the completed
application along with the dues
payment to the Membership Di-
rector shown on
the form. If you are *Continued, P. 9*

August Indoor Rock Swap/Picnic

Thanks for the pictures, Marc Mueller



MAGS Notes

Continued from P. 8

unable to print the application, you can pick one up at the sign-in desk at any of our Friday night Membership Meetings, or simply join at the meeting. Visitors are always welcome at our Membership Meetings but membership is required to attend our field trips.

The most important benefit of being a MAGS Member is getting to know and make friends with other Members who have similar interest in rocks, minerals, fossils, and archaeology. All new Members

will receive a New Member Packet, a MAGS ID card, and a monthly newsletter via email. Members are entitled to go on our monthly field trips and get free admission to our annual Show.

July Board Minutes

Mike Coulson

Called to order 6:15. Present: W. C. McDaniel, Kim Hill, Bonnie Cooper, Bob Cooper, Dave Clarke, Nannett McDougal-Dykes, Mike Coulson, Jane Coop

Secretary: Distributed copies of the June Minutes. Report approved.

Treasurer: Rent has been paid through the end of the year. Report approved.

Membership: Several new members.

Field Trips: Upcoming field trips: July 20, Turkey Creek. August 17, Parkin Museum. Club paying for admission. Sept 27, 28, 29, Geode Fest in Illinois. More to come, need to register by Sept. 15th. October, ideas, suggestions welcome. DMC trip a possibility. Alan will let us know. (Fort Payne tourmaline). November, Parsons. December No outing

Adult Programs: Upcoming adult programs: July 12, Ryan Parish decided to give presentation

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MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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MAGS UPCOMING EVENT SCHEDULE

Month	Membership Meeting Programs	Hospitality & Featured Display	Field Trips	Other Events
September	September 13 <ul style="list-style-type: none"> • Adult—Crinoids, Elizabeth Rhenberg • Youth—Native American Lore and Artifacts, Kim Hill 	Hospitality <ol style="list-style-type: none"> 1. Dotty Coulson 2. Need one more Featured Display Crinoids	September 27-29 Geode Fest in Illinois	September 28 & 29 <ul style="list-style-type: none"> • MAGS at the Zoo Harvest Festival • Need help and lapidary demonstrators (will be able to sell)
October	October 11 <ul style="list-style-type: none"> • Adult—Bill Prior (Arkansas Geological Survey), Sinkholes, particularly the one in Arkansas that was in the news recently. • Youth—How Minerals Play a Part In Our Daily Lives, W. C. McDaniel 	Hospitality <ol style="list-style-type: none"> 1. DeeDee Goossens 2. Need one more Featured Display Agate from a gravel pit/mine	October 12 DMC Field Trip (MAGS sponsored), Memphis Stone & Gravel Co.	<ul style="list-style-type: none"> • October 5 & 6—Rock show in Greater Little Rock area • October 19—MAGS rock swap
November	November 8 <ul style="list-style-type: none"> • Adult—Dr Michael Gibson, Vulcan Quarry • Youth—Mike Baldwin, Who Are the Native Americans and Where Did They Come From? 	Hospitality <ol style="list-style-type: none"> 1. Mildred Schiff 2. Need one more Featured Display Vulcan Quarry fossil	November 16 Vulcan Quarry	

July Board Minutes on Poverty Point. August 9, Rock Swap. September 13, program will be given by Dr. Elizabeth Rhenberg (University of Memphis) and will focus on crinoid fossils. October 11, Bill Prior (Arkansas Geological Survey) will do a program about sinkholes, particularly the one in Arkansas that was in the news recently. November 8, Michael Gibson, Vulcan quarry. December 13, Holiday Party.

Junior Programs: The July youth program will be “Gemstones and the MOHS hardness scale” presented by Jane Coop. Programs for the remainder of the year will not change. August—indoor picnic/rock swap with the adults. September—“Native American Artifacts and Lore” with Kim Hill. October—“Everyday Uses of Minerals” with W. C. McDaniel. November—“Origins of the Native

Americans” with Mike Baldwin. December will be the Holiday Party. The youth have not decided what they would like to call themselves. In addition to MAGS Explorers and MAGS Minor Miners (M3), add MAGS Rock Stars (using a meteor as the “o” in Rock) as a possible name choice.

Library: Received several books. U. of M. professor will be donating more books.

Show: Summer break, not yet planning. Would like to approve dealer contracts at August meeting.

Rock Swaps: August 9—Membership Meeting is rock swap. October 13—Try setting one up in October, the Sunday after Membership Meeting, Freeman Smith Park (small one on Brunswick), in Bartlett. Carol said Sunday may have low attendance so consider Saturday instead.

Editor: Get those articles and schedules to Matthew. He is Florida but

took his work with him.

Web: July newsletter added to website. Also home page, calendar page, newsletter & newsletter index pages.

Old Business: Possible insurance issue for class at College of Art. Approximately 30 people attended the dedication reception of the MAGS-sponsored Chucalissa display case at the C. H. Nash Museum, which houses pottery excavated from the village years ago. It was dedicated to the memory of Sherri Baldwin.

New Business: None.

Adjourned 6:33.

July Meeting Minutes

Mike Coulson

Called to order at 7:10. Three visitors tonight.

Library: Added two new books. U of M contacted us about books on rocks

Continued, P. 11

July Meeting Minutes donated by a professor who is no longer with us.
Continued from P. 10

Rock Swaps: Aug. 9 rock swap will be at the regular meeting. October 12 at a park. We will meet, eat, picnic, and swap rocks.

Field Trips: Sign up sheet for Turkey Creek is at front desk. Info is available for Geode Fest in September. Club will pay for admission at Parkin if Member is signed up. nMay 2020 for Gainesville, Florida, trip hunting for Megalodon and other shark teeth.

Adult Programs: August 9—Rock Swap. Eat, swap, buy rocks. More info to come in the newsletter. September 13—Elizabeth Rhenberg, Crinoids. Two displays plus “I found it” display.

Meeting Program: Ryan Parish gave presentation on Poverty Point in Louisiana.

Adjourned 8:36.

14,400-year-old Pita

Matthew Lybanon, Editor

Publishers can't reprint cookbooks from our ancient ancestors because there aren't any, and modern "Paleo Diet" authors seem to overlook something: just because there isn't much evidence doesn't mean that our forebears didn't eat their veggies.

It's often mentioned that archaeologists learn a great deal from sifting through garbage. A midden (or kitchen midden) is the archaeological term for trash or garbage heap. Middens are a type of archaeological feature, consisting of localized patches of dark-colored earth and concentrated artifacts which resulted from the deliberate discard of refuse, food remains, and domestic materials such as broken and exhausted

tools and crockery.

When archaeologists look in middens and elsewhere for clues to what ancient people ate, it's no surprise that they find more animal bones than anything else. Usually soft organic matter decays over long time intervals while the bones remain pretty much intact. But there are exceptions.

Archaeologists digging in the Black Desert of Jordan have found the oldest-known bread in the world. Created 14,400 years ago, the specimen predates proper agriculture by thousands of years. Charred remains found in fireplaces at the site were identified as "bread-like" by rigorous archaeological criteria. No less than 24 food remains were identified at the Shubayqa site as being bread-like, 22 of which were found in the fireplace dating back 14,400 years.

The Shubayqa product was very like unleavened flatbreads identified at Neolithic and later Roman sites in Europe and Turkey.

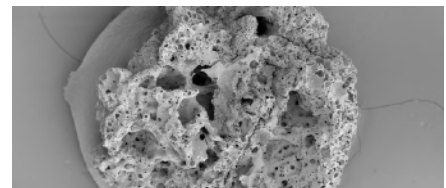
As foods go, bread is a recent invention, but then so is agriculture. Actually, "cultivation" seems to have stutteringly begun thousands of years before this bread was baked. At Ohalo, a site in Israel by the Sea of Galilee, archaeologists have controversially identified grain cultivation going back 23,000 years.

Microscopic analysis of the Shubayqa fireplace finds showed the locals used about 95 different plants, mostly a bulrush that produces edible roots, shoots and "nutlets". They also found barley, oats and wheat. However, whether or not these ancient people in the

Levant, the Natufians, deliberately grew and nurtured the grains or opportunistically collected edible weeds is not clear.

No evidence of agriculture has been found at Shubayqa: the grains were wild-type. Stone tools were found but precious few were sickle blades. Hence the archaeologists' conclusion that the flatbread baked in the Jordanian desert was pre-agriculture, made of gathered ingredients. But additional evidence may lead to a different conclusion.

Interested in going beyond this brief description? Again, it's no surprise that someone put a video on YouTube. "Archaeologists Made A 14,400 Year Old Discovery In Jordan That Radically Rewrites Human History" is the title of the video at <https://www.youtube.com/watch?v=NAzhNRo-lm0E>. And the scientific details are published in Amaia Arranz-Otaegui et al, Archaeobotanical evidence reveals the origins of bread 14,400 years ago in north-eastern Jordan, PNAS July 31, 2018 115 (31) 7925-7930; first published July 16, 2018 <https://doi.org/10.1073/pnas.1801071115>.



MAGS At A Glance

September 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 	3	4	5 Board Meeting, 6:30 pm, St. Francis Hospital	6	7
8	9	10	11	12	13 Membership Meeting, 7:00 pm, "Crinoids"	14
15	16	17	18	19	20	21
22 DMC Field Trip, Summerville, GA, 9:00 am	23	24	25	26	27 MAGS Field Trip, Geode Fest, Illinois	28 MAGS Field Trip, Geode Fest, Illinois/ MAGS at the Zoo
29 MAGS Field Trip, Geode Fest, Illinois/ MAGS at the Zoo	30	1	2	3	4	5

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