

May Program

Shark Teeth And Other Fossil Hunting In Florida, Carol & Matthew Lybanon



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Why is Venice, Florida, the “Shark Tooth Capital of the World”? There were millions of sharks for millions of years, and each shark had a lot of teeth. Shark teeth can be found all over—even in the Colorado mountains. But something makes Venice

special.

This month’s presentation will answer that question, and give you practical information on hunting for these treasures. And you can find more than shark teeth—some on the beach, and some in other places.

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MAY 20 OUTDOOR ROCK SWAP

The first rock swap of 2023 will be on Saturday, May 20, 11:00 A.M.-2:00 P.M., at the home of Jan Shivley, 305 North Willet Street in Memphis. Jan’s home is in Midtown (see map on P. 3).

We ask Members to bring packaged snacks and sweets to share, folding chairs, and tables if you plan to sell or trade.



Join us for a fun social event.

For more information, contact Carol [(901) 493-6700] or Jan [(901) 550-7373].



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

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 Membership Meetings are at 7:00 P. M. on the second Friday of each month May-October, and 10:00 A.M. on Saturday after the second Friday November-April. 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: <https://earthwideopen.wixsite.com/rocks>



Please contribute articles or pictures on any subject of interest to rockhounds. The 20th of the month is the deadline for next month's issue. Send material to lybanon@earthlink.net.

Go to <https://www.southeastfed.org/sfms-field-trips/dmc-field-trip-program> for the DMC field trip schedule and other information.

Links to Federation News

- ➔ AFMS: www.amfed.org/afms_news.htm
- ➔ SFMS: <https://www.southeastfed.org/>

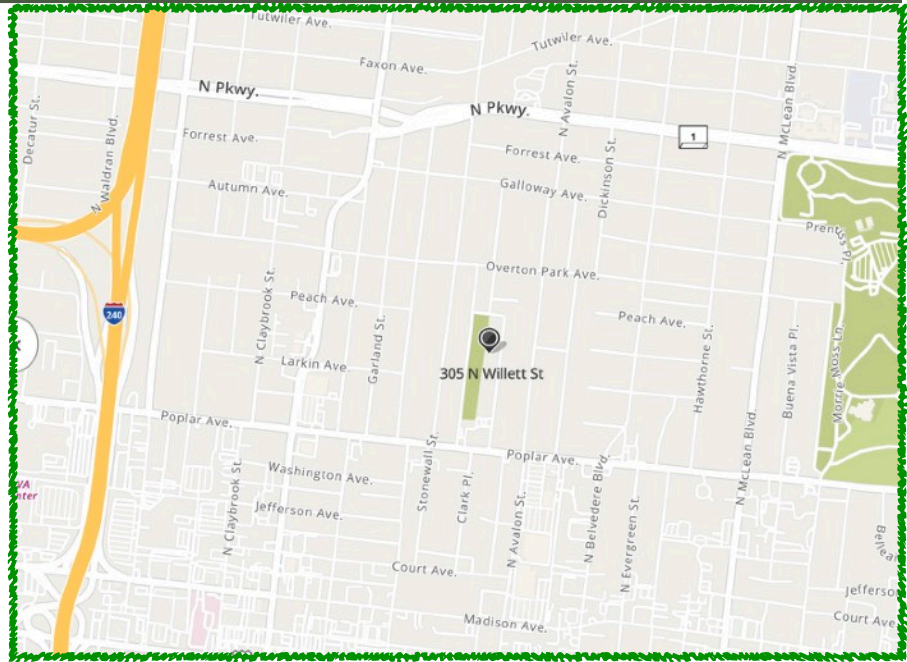
MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

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Shark Teeth ... In Florida Venice is on Florida's Gulf coast, in southern Sarasota County. And there are lots of beaches in the area. We'll tell you which ones we like, and why.

Florida wasn't even Florida until recently (in geological terms). The first part of what is now Florida didn't emerge from the ocean until about 30 million years ago. Even so, surprisingly, (according to the Florida Museum at the University of Florida) Florida has the richest fossil record of vertebrate animals of the eastern United States. This talk will mention some of the places where fossil hunters can find some of these, along with the rich variety of marine fossils Florida has to offer.

Getting back to sharks, the biggest that ever lived, Megalodon (meaning "big tooth"), also left teeth lying around. Meg teeth are bigger and heavier than other shark teeth, so it takes much more wave energy to bring them in and deposit them on the beaches. So



May 20 Outdoor Rock Swap Location

you don't find many of them on beaches. How can you find some? Come to the May meeting and find out.

New Book Review

Nannett McDougall-Dykes
Tyrannosaurus Rex

The Tyrant King

This is a spectacular pop-up book to explore the life and times of this ferocious Dinosaur. And after lifting the flaps and learning the facts, open up the book into a two-foot-long full-color, three-dimensional Tyrannosaurus Rex ...

Fabulous Tennessee Fossils

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

FTF 99

Alycia Stigall—UT Tennessee Knoxville Paleontologist

Dr. Alycia Stigall is the new Jones/Bibee Professor and Department Head of the Department of Earth and Planetary Sciences at The University of Tennessee, Knoxville, having only arrived in 2022. She arrived at UTK by way of a Bachelor of Science degree in biology, and another in geology, from The Ohio State Uni-

versity in 1999 after which she moved to the University of Kansas for both her Master of Science and her Doctoral degrees, where she worked under the tutelage of Bruce Lieberman. Her interest in paleontology came naturally as she grew-up in Cincinnati with its abundant Ordovician marine fossils. The Cincinnati region has

been the professional birthplace of many prominent paleontologists since the middle 1800s with luminaries like Charles Schuchert, a person from whom many paleontologists today can trace their professional genealogies, including me. Many of America's best paleontologists and most productive amateur paleontol-



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Core Studies

Matthew Lybanon, Editor

Editor's Note: "Getting Down To The Core" in the April 2022 issue of MAGS Rockhound News describes other research dealing with the Earth's core. Also see "Inge Lehmann, Science Pioneer" in the October 2022 issue.

Not long ago it was thought Earth's structure comprised four distinct layers: the crust, the mantle, the outer core, and the inner core. Recent studies of seismic data indicates that (a) the direction of the inner core's rotation may be reversing, and (b) there is a fifth layer.

Studies have suggested that the inner core may rotate within the liquid outer core, driven by the outer core's magnetic torque. Researchers have also argued the mantle's immense gravitational pull may apply an erratic brake on the inner core's rotation, causing it to oscillate.

Evidence for the inner core's fluctuating rotation first emerged in 1996. Geophysicists at Columbia University's Lamont-Doherty Earth Observatory Paul Richards and Xiaodong Song (now at Peking University) reported that over a span of three decades, seismic waves from earthquakes took different amounts of time to traverse Earth's solid heart.

The researchers inferred that the inner core rotates at a different rate than the mantle and crust, causing the time differences. The planet spins roughly 360° in a day. Based on their calculations, the researchers estimated that the inner core, on average, rotates about 1° per year faster than the rest of

Earth.

In the new study, while analyzing global seismic data stretching back to the 1990s, Song and geophysicist Yi Yang—also at Peking University—made a surprising observation.

Before 2009, seismic waves generated by sequences and pairs of repeating earthquakes traveled at different rates through the inner core. This indicated the waves from recurring quakes were crossing different parts of the inner core, and that the inner core was rotating at a different pace than the rest of Earth.

But around 2009, the differences in travel times vanished. That suggested the inner core had ceased rotating with respect to the mantle and crust. After 2009, these differences returned, but the researchers inferred that the waves were crossing parts of the inner core that suggested it was now rotating in the opposite direction relative to the rest of Earth.

The researchers then studied records of Alaskan earthquake doublets dating to 1964. While the inner core appeared to rotate steadily for most of that time, it seems to have made another reversal in rotation in the early 1970s.

Song and Yang infer that the inner core may oscillate with a roughly 70-year periodicity—switching directions every 35 years or so. Because the inner core is gravitationally linked to the mantle and magnetically linked to the outer core, the researchers say these oscillations could explain known 60- to 70-year variations in the length of Earth's days and the

behavior of the planet's magnetic field. However, more work is needed to pin down what mechanisms might be responsible.

In other work, data captured from seismic waves caused by earthquakes has shed new light on the deepest parts of Earth's inner core, according to seismologists from The Australian National University (ANU).

By measuring the different speeds at which these waves penetrate and pass through the Earth's inner core, the researchers believe they've documented evidence of a distinct layer inside Earth known as the innermost inner core—a solid 'metallic ball' that sits within the center of the inner core.

"The existence of an internal metallic ball within the inner core, the innermost inner core, was hypothesized about 20 years ago. We now provide another line of evidence to prove the hypothesis," Dr. Thanh-Son Pham, from the ANU Research School of Earth Sciences, said.

The researchers analyzed seismic waves that travel directly through the Earth's center and "spit out" at the opposite side of the globe to where the earthquake was triggered (the antipode). The waves then travel back to the source of the quake. The researchers analyzed data from about 200 magnitude-6 and above earthquakes from the last decade.

The researchers studied the anisotropy of the iron-nickel alloy that comprises the inside of the Earth's inner core. Anisotropy is used to describe how seismic waves speed up or

Continued, P. 5

Core Studies slow down
Continued from P 4 through the Earth's inner core depending on the direction in which they travel. It could be caused by different arrangement of iron atoms at high temperatures and pressures or preferred alignment of growing crystals.

They found the bouncing seismic waves repeatedly probed spots near the Earth's center from different angles. By analyzing the variation of travel times of seismic waves for different earthquakes, the scientists infer the crystallized structure within the inner core's innermost region is likely different than the outer layer. They say it may explain why the waves speed up or slow down depending on their angle of entry as they penetrate the innermost inner core.

According to the ANU team, the findings suggest there could have been a major global event at some point during Earth's evolu-

tionary timeline that led to a "significant" change in the crystal structure or texture of the Earth's inner core.

RECENT UPDATE: A new discovery suggests that the Earth's core is surrounded by an unexpected ancient structure. A high-resolution map of the underlying geology beneath Earth's Southern Hemisphere revealed the discovery, according to a new study published in *Science Advances*. This study claims that an ancient structure that scientists believe to be an ocean floor surrounds the core of our planet.

The measurements gathered by seismic monitoring stations show that the ancient structure surrounding Earth's core has valleys and mountains, as the material's thickness varies from place to place. Scientists believe the structure could be the remnants of an ancient ocean floor that lies beneath Earth's surface.

It isn't clear whether this is a different interpretation of the data that seemed to show the innermost inner core (as described above), or whether this is really a new discovery. Studying the Earth's core is an active area of scientific investigation at present.

References:

1. Yang, Y., Song, X. *Multidecadal variation of the Earth's inner-core rotation.* *Nat. Geosci.* 16, 182–187 (2023). <https://doi.org/10.1038/s41561-022-01112-z>.
2. Pham, TS., Tkalčić, H. *Up-to-five-fold reverberating waves through the Earth's center and distinctly anisotropic innermost inner core.* *Nat Commun* 14, 754 (2023). <https://doi.org/10.1038/s41467-023-36074-2>.
3. Hansen, S.E. et al., *Globally distributed subducted materials along the Earth's core-mantle boundary: Implications for ultralow velocity zones,* *Science Advances* 5 Apr 2023 Vol 9, Issue 14 DOI: 10.1126/sciadv.ad4838.

Fabulous Tennessee Fossils ogists have
Continued from P. 3 ties to the "Cincinnati School" of paleontology.

I asked Alycia how she got interested in fossils to begin with and she shared a familiar story. As a child, Alycia spent hours in a stream near her home that was full of fossils and found she enjoyed collecting, sorting, and cataloging her treasures. Guess what, her first fossil book was a 1959 *Golden Guide to Fossils* that she received from her first-grade teacher mother (both of her parents were teachers); a story like the one I highlighted in FTF 97. As with all of us, her collections grew as she took family trips

in summers and to such places as National Parks. During her days at The Ohio State University she discovered that geology and biology shared common goals; she decided to upgrade her career goals from high school biology teacher to university professor.

East Tennessee has had a long history of Ordovician fossil studies, especially during the 1970s and 1980s (I have already mentioned Len Alberstadt from Vanderbilt and Ken Walker from UTK in earlier essays—more to come on that in the future), but the 2020s have brought new techniques to employ and new concepts for paleontology to test. Alycia is on the forefront

of modern research on the Ordovician time frame, thus leading a new generation of paleontological study that has expanding UTK's long history of groundbreaking discoveries. One of her current research projects is the Late Ordovician "Richmondian Invasion" preserved in the fossiliferous strata around Nashville, which was an event during which marine species from nearby marine basins invaded our region. The dynamics in fossil "invasive species" has implications for similar events in our modern oceans. I also asked her what organism is her "favorite fossil". Not surprising, her favorite is *Continued, P. 5*

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Fabulous Tennessee Fossils the common or
Continued from P. 5 thid brachiopod *Vinlandostrophia ponderosa* (which most of you will know under its earlier more widely known name of *Platystrophia* and which was a leading candidate for Tennessee State Fossil back in the late 1990s). I have seen many of you MAGsters with this robust brachiopod in your collections as well. Look back at FTF 36 from January 2018 for my essay on this great brachiopod.

Dr. Alycia Stigall has already had an amazing career (she was also the department Chair at Ohio University, along with a distinguished career in many paleontological societies and museums and with a very long publication run). She is strong advocate of diversity and inclusion. I have already heard from many of the UTK colleagues that she had done some great things at UTK in her short time there and that they are excited about her as their new leader. By the way, she is the FIRST woman department chair in the UTK geology program history—what an accomplishment! She has an amazing personality and as an alumnus of UTK myself, I fully echo the sentiment of her colleagues—that she will help lead UTK to some new and great things, especially in paleontology. I asked Alycia for a “fun fact” from her career thus far. She proudly indicated another great thing all of us fossil enthusiasts share—we do like to travel in the quest to find fossils. She has already collected fossils on all seven continents! Yep, even in Antarctica. One more thing. Alycia loves her brachiopods, but she

also has a keen interest in what are called “clam-shrimp”, conchostracans, which are very tiny crustaceans that often inhabit ephemeral lake environments. She was able to spend six frigid weeks in Antarctica and collected conchostracans from Jurassic-age paleolakes. Welcome to Tennessee, Dr. Alycia Stigall!



Figure 1. University of Tennessee, Knoxville paleontologist Dr. Alycia Stigall (photo provided by Dr. Stigall)



Adult Programs

May 12: Carol & Matthew Lybanon, “Shark Teeth & Other Fossil Hunting in Florida.”

June 9: Jeremy Veldman, “Solar Eclipses.”

July 14: TBD

Junior Programs

May: With adults.

June: & July TBD.

Field Trips

May-July: TBD

May Birthdays

- 2 Aniyah Thomas
- 4 Joel Webster
Sunny Finch
- 9 Carol Lybanon
- 11 Mary Elliott
Theresa Childress
- 12 Pam Crumpton
- 13 James Butchko
- 16 Robert Duncan
- 17 Dave Kitkowski
- 20 Michele Robbins
- 23 Zoe Sams
- 25 Mike Dempsey
- 27 Kelly Bowen
- 28 Colby Wrasse
- 29 Susan Boyd
- 30 Herb Nicholson

New Members

- Ricky & Valencia Davis
- Matt Dempsey
- Diane & Jorge Leal Donohue
- Angela Graves
- Lorrie Jackson
- Debbie McCown
- Ryan & Lorrie Parish and family
- Kevin Perk
- Rick & Bennie Stone
- Daniel Waddell & Gwyneth Lewis

Rock Swap

May 20, 11:00 A.M.-2:00 P.M., at the home of Jan Shivley, 305 North Willet Street. See P. 1 for more information and P. 3 for map.



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Looking At The Show

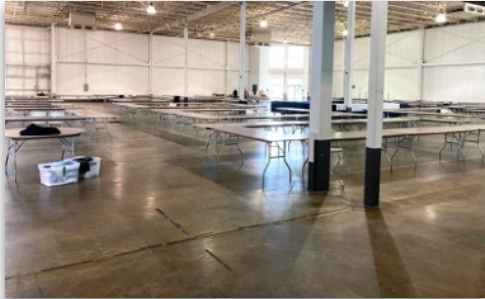


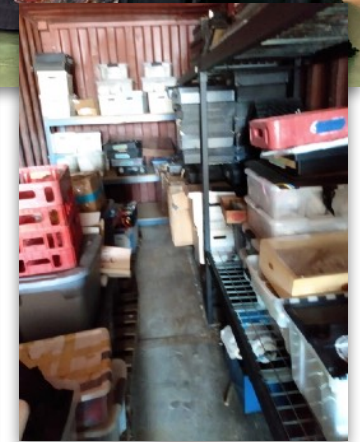
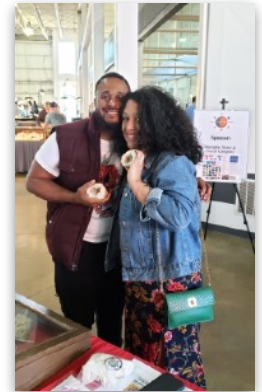
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The Last Grab Bag!



Looking At The Show (continued)



Grand Prize Winner

Everything Back In The Shed

March Board Minutes

Joshua Anderson

Zoom meeting called to order 6:30. Present: W.C. McDaniel, Christine McManus, Joshua Anderson, Carol & Matthew Lybanon, Bonnie & Bob Cooper, Nannett McDougal-Dykes, Melissa Koontz, Jim Butchko

Secretary: Minutes submitted via email, presented to Board and approved..

New Business: None

Treasurer: Treasury report presented to Board and approved, which included paying Club/Show liability insurance.

Membership: Two new Members. Addressed some email concerns over some current Members.

Field Trips: February: Belz Museum issues. March: Crow Creek.

Youth Programs: March: Combined Youth and Adult. April: Artifacts, Tools, and Utensils. May: Sharktooth hunting with adults.

Library: New books added.

Editor: December newsletter completed and out. Deadline to submit content for the newsletter is the 20th of the month.

Web: No report.

Rock Swaps: None scheduled.

Adult Programs: June: Dr. Ryan Parish, Nonconnah Creek. July: Metal Museum

Show: Thirty signed dealers. Security still unsigned—text commit from Sheriff’s Department..SignUpGenius: Carol Lybanon will coordinate. Marketing: postcards, emails, show tickets at meeting for Members, possible signage out on major roads near Agri-Center (2-3 words). Grab bags: Thursday 3-5:30pm. Cooper Moving: doing all work this year – no need to help grab buckets for grab bags again like 2022.

Old Business: Some Board Members still need to vote on 2023 meet-

ing schedule. Adjourned 7:29pm

Jewelry Bench Tips by Brad Smith

DRILLING SMALL ITEMS



Small pieces need to be held securely while drilling to prevent them from spinning if the drill catches. Having sliced my fingers occasionally in my younger days, I avoid band-aids now by using flat-jaw pliers or a ring clamp. Pliers also save you if the piece gets hot. Put a little tape over the plier jaws if needed to avoid scratches.

DRILLING A STONE



One of the things my students often ask to do is drill a hole through a piece of gemstone. The usual thought is to get a diamond drill, but I've been disappointed with them. I think the reason is that the tip of the drill is just pivoting in the hole and fails to cut well. When it looks like the drill isn't cutting, the tendency is to push with more force. The drill

gets hot, and the diamond grit falls off.

A much better approach is to use a core drill. This is a small hollow tube with a coating of diamond grit at the business end. The diamonds easily carve out a circular arc without undue pressure or heat buildup.

Core drills are readily available from lapidary and jewelry supply companies. They come in sizes as small as 1 mm and are very reasonable in price. For instance, a 2 mm diameter drill is about \$6.

Chuck the core drill in a drill press, Dremel, or Foredom, and be sure to keep the drilling zone wet to cool the tool and to flush out debris. Also, if you're drilling a through hole, go very easy on the pressure as the drill is about to cut through. Otherwise you will usually chip off some of the stone surface around the hole.

See Other Tips in my Smart Solutions for Jewelry Making Problems.

<http://amazon.com/dp/B0BQ8YVLTJ>

Federation Note



William Holland still has openings for students to sign up for the June SFMS class. If you are interested please download a form and get registered.

www.sfmshworkshops.org

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MAGS At A Glance

May 2023

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
30	1	2	3	4 Zoom Board Meeting, 6:30 pm	5	6
7	8	9	10	11	12 Membership Meeting, 7:00 pm, "Shark Teeth And Other Fossil Hunting In Florida"	13
14 	15	16	17	18	19	20 Outdoor Rock Swap, 11:00-2:00, home of Jan Shivley/DMC Field Trip
21	22	23	24	25	26	27
28	29 	30	31	1	2	3

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