MEMPHIS ARCHAEOLOGICAL AND GEOLOGICAL SOCIETY

MAGS Rockhound News

Volume 68 ◊ Number 02 ◊ February 2022 ◊ A monthly newsletter for and by the members of MAGS

Dinosaur Paleontology in the Bighorn Basin

Jason P. Schein, Bighorn Basin Paleontological Institute

Jason Schein founded the Bighorn Basin Paleontological Institute in 2017 and the organization has thrived under his leadership ever since. In his extensive professional experience, including ten years as Assistant Curator of Natural History at the New Jersey State Museum, he has developed a diverse slate of engaging educational programming in the fields of natural history, geology, and paleontology for audiences of all ages, specializing in creating unique, hands-on experiences to help people experience the power of science.

His scientific research projects have led him across the globe, from

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In this issue

VOLUNTEER/VOLUNTEERED/VOLUNTEERING/VOLUNTEERS

CAROL LYBANON

Are we going to have enough volunteers to put on our Show in April? It's really important to see how many of our Members plan to volunteer this year. We are planning to cut back a little, but without your help we won't be able to do the Show at all!

We will continue using SignUp Genius. Members will be contacted when we are set up. We will also offer Members prizes for volunteering. This year we have a Volunteer Grand Prize (pictured on P. 4). There will also be other prizes, so volunteer for as many time slots as you can. You will receive one entry for each slot and have other

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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 or https://earthwideopen.wixsite.com/rocks

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 20th of the month is the deadline for next month's issue. Send material to lybanon@earthlink.net.

February DMC Field Trip

WHERE: Ross Creek, Gruetli-Laager, TN

WHEN: Saturday, February 19, 2022, 9:00 A.M.

COLLECTING: Pennsylvanian and Mississippian carboniferous plant fossils

First in 2 years

CONTACT: Charlie Jones, (423) 653-4479

Links to Federation News

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

Dinosaur Paleontology in the Bighorn Basin
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Alabama to Montana and even to Argentinian Patagonia, to study an array of fascinating creatures, including modern echinoderms, ancient foraminifera, fish and turtles, mosasaurs, and of course dinosaurs! Jason's love of our planet's history continually leads him to explore a vast range of subjects, including Mesozoic (primarily Jurassic and Cretaceous) vertebrate marine and terrestrial faunas, paleoecology, paleobiogeography, faunistics, taphonomy, biostratigraphy, functional morphology, sedimentology, and general natural history.

When he isn't working, you can find Jason exploring his current city, Philadelphia, or hiking, hunting, fishing, and generally sharing his love of the natural world with his family.

President's Message

Year of MAGS 2022

Dues

- Please renew your 2022 Membership Dues. Help the club and yourself.
- Dues provides the financial means and ability for your club to exist.
- Dues provides you the opportunity to fully participate in MAGS and DMC events such as field trips. The DMC field trip in February to collect fossils is easily worth the price of dues. A better bargain than "Seward's Folly."

February 11 meeting

- In person, mask required.
- Adult and Junior programs will be presented.
- Adult speaker will appear via. Zoom.
- Bring those exhibits. W.C. will display some dino poop, bones, and egg.

Show

- Rocks are Back.
- Memphis Mineral Fossil, Jewelry Show.
- "The Earth Wide Open".
- Sponsored by the Memphis Archaeological and Geological Society.
- Saturday, April 23, 9:00-6:00 and Sunday, April 24 10:00-5:00, Memphis Agricenter International.

W. C.

My Rock Collection

Sarah Siegel

I'm a new Member as of January 2022. Here's a photo of my rock collection. The bottom shelf includes rocks and minerals that I bought when I was ages 10-12 when my best friend and I were the youngest members of the Stamford Mineralogical Society in our hometown of Stamford, Connecticut. I bought them at the SMS's auction for about $0.50-$2.00. From Pune, India, and Arizona, and....

New Universe

Alan Goldstein

Editor's Note: *Alan Goldstein is the Interpretive Naturalist at Falls of the Ohio State Park, Clarksville, Indiana*

Alan Goldstein announces the birth of a 'new universe.' His first novel, *The Dragon in My Back Yard*, published in 2021, motivated him since most writers have websites. However, most author websites serve only to sell books. As a lifelong naturalist and educator, he is developing one that provides interesting and useful content.

https://alangoldsteinsuniverse.com focuses on three areas: "Books Plus" (writing), "The Earth," and "The Sky." Each section provides useful information. To maintain the website, he sells his novel, fossils, and minerals (especially Steve Garza's collection). However, educational content is

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volunteers ... Continued from P. 1 opportunities to earn extra entries. Do not forget you must sign up on SignUp Genius to be counted. The drawing for volunteer prizes will be at the May Membership Meeting. You don't have to be present to win.

Let's have a show of hands.

Please call Carol or W.C. and volunteer right now. Will you be able to do the jobs you have done in past years? Let us know so we won't have to cancel at the last minute because of no volunteers.

Carol: (901) 493-6700, sgcarol@earthlink.net; **W.C.**: (901) 490-3575, w.c.mcd@att.net

Volunteer Grand Prize:
Petrified Wood Bowl

New Universe Continued from P. 3 being added regularly.

If you explore "The Earth" pages, you will find:

- Fossils—with background information and faunal lists, and published articles written by Alan over the years. Identification pages (through the photo gallery) have Paleozoic corals, blastoids (such as 16 species of Pentremites), crinoids, bryozoans & brachiopods—well underway—with other invertebrates coming soon.
- Minerals—collecting, Steve Garza's collection specimens for sale, photos from decades of mineral collecting. Captioned pictures of calcite & dolomite are up with fluorite and other minerals coming along. Like most pages, content will be added, including all of his Mineral News articles published over a dozen years.
- Nature—expanding resources and information about the world around us. It will highlight flora and fauna. As a professional naturalist, he will focus on what makes our world interesting.
- Photo gallery—including fossils (organized for identification), minerals (especially those of the Ohio Valley), geology (natural areas, caves, collecting sites), nature (flora, fauna, and weather), and "my favorites" (with the weird, humorous, and historical images).

"The Sky" page features everything astronomical. Combining his love of writing with being an amateur astronomer for 50 years he has a lot of stories to tell. *Astronomy* magazine has been his primary outlet since 1981 with nearly 40 articles published.

He welcomes contributions by the rockhound community! Just drop him an email at info@alangoldsteinsuniverse.com.

While we are along for the ride in our universe, I hope you will explore mine! And if you are looking for fossils or minerals for your collection, check out the featured specimens or my species lists.

More Than Just A Rock

Matthew Lybanon, Editor

About seven years ago the *Daily News Journal* in Murfreesboro, Tennessee, reported that Betty LeMaster of nearby Smyrna had discovered that the rock she used as a doorstop for 15 years is a 450-million-year-old fossil.

She found the 10-pound rock when she was cleaning up her property. It propped open the door between her washroom and den until she became curious about it while watching a television program called "America Unearthed."

Alan Brown, a geosciences instructor at Middle Tennessee State *Continued, P. 5*

More Than Just A Rock
Continued from P. 4

University, said LeMaster's rock is a fossilized coral.

The rough exterior is dotted with dime-sized chambers that appear to have star-burst-like protrusions. Those protrusions are tentacles, which were likely used to anchor down in order to avoid being eaten by fish.

LeMaster said she is happy to finally learn about her rock, calling it "a piece of history."

Maybe I should have another look at that yard rock.

Fabulous Tennessee Fossils

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

FTF 84

Productid Brachiopods at Pickwick Landing

Pickwick Dam in Hardin County, Tennessee, is where the Tennessee River makes a dogleg turn to the north after flowing across North Alabama through Muscle Shoals. The dam is a TVA flood control and hydroelectric facility begun in 1938 and finished four years later during World War II in 1942. The dam was expanded upon in 1984. As is typical of many dams, riprap was used extensively around the dam, especially along the down-river banks, to retard erosion. The rocky areas are favorite spots for land-based fishing and for fossicking. I frequently bring students to the dam for discussions of the geology of Tennessee, specifically the unusual course that the Tennessee River takes across Tennessee and the role that TVA has played in Tennessee's geology and history. During a pre-Covid visit several years ago, the students spent some time climbing over the riprap along the bank on the south side of the river, just west of the dam, as it was a nice warm afternoon. They were watching the dam and effluent for class, but otherwise relaxing and looking at the lithologies and fossils. One of the students noted that the some of the riprap was darker than most. I used this as an opportunity to discuss limestone resources in that part of the state and the likely local quarry origin for the riprap. Interesting, the darker riprap blocks were differently shaped as well, only occurred within one area of the embankment, and had a very different fossil content than what I was aware of for this region. Our task was to locate the origin of these blocks and identify the fossils.

Kingdom Animalia
Phylum Brachiopoda
Class Strophomenata
Order Productida
Family Productidae
Genus *Dictyoclostus* Muir-Wood, 1930
D. cf. *inflatus* (McChesney, 1859)
Genus *Echinoconchus* (Weller, 1914)
E. cf. *alternatus* (Norwood & Pratten, 1855)

One of the wonderful set of books I have in my personal library is the complete set of the TVA's summary technical reports for building all of the TVA dams along the Tennessee River. My copies came to me while I was a graduate student at UT Knoxville in the 1980s and were originally in the personal library of Berlin C. Moneymaker, who was a geologist for TVA for many years. The volumes document all aspects of the local geology, design engineering and construction of the dams, including the construction of TVA towns and campus that housed the workers and their families during each project, detailed budgets, equipment inventories, and economic and social impact of the project. The Pickwick Landing Project (Technical Report 3) was completed in 1941. According to the report, the dam was built on top of the Ross Limestone (Devonian) with overlying units around the dam being excavated including the overlying Olive Hill, Pyburn Limestone, Hardin Sandstone, New Providence Shale, Fort Payne cherty limestone (Mississippian), and nearby Cretaceous Eutaw Sand. The units were excavated out to form the reservoir basin

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Fabulous Tennessee Fossils
Continued from P. 5

and "where suitable, rock was used for riprap". The riprap units would be Ross Limestone, Pyburn Limestone, and Fort Payne cherty limestone if collected locally. Sure enough, fossiliferous blocks of these units can be found in the riprap and some collectors are known to frequent the riprap for fossil hunting (be forewarned that taking the blocks is actually stealing from federal lands, however).

On this day, the students discovered large blocks of a fossiliferous limestone containing a fossil brachiopod taxon that I had never seen in any of the rock units named above, and certainly not in the abundance and shell size that these blocks preserved (Figure 1). The fossils (Figure 2) are productid brachiopods. Productids are an order within the strophomenid brachiopods. Strophomenids are flattened "potato chip" brachiopods with long straight hinglines and relatively thin shells. Common Ross Limestone strophomenids include *Mesoleptostrophia* and *Leptaena* (See FTF # 73 and 74). Productids are different from most strophomenids in that they have an inflated ("fattened") pedicle valves with a flat brachial valve (Figure 2). Many had short to long spines growing out of the pedicle valve. Productids were believed to "nestle" into the sediment surface (although productids with long spines may have either cemented those to a substrate or used them like stilts to sit above the sediment floor). Productid brachiopods ranged from the Ordovician through Permian periods with their heyday in the Mississippian through Permian periods.

There appear to be two genera and species of productid in our slab (Figure 1). The smaller is *Dictyoclostus* cf. *inflatus* (Figure 2A), which is a very early Mississippian species. It is easily recognized by its size range, reticulate surface becoming costate distally, lack of spines, deep sulcus in the pedicle valve, and having minor wings ("auriculate") along the hingeline edges. The second genus in the block is *Echinoconchus* cf. *alternatus* (Figure 2B), which is identified by its more elongate shape that tapers toward the hinge, incurved hinge line, larger size, and the reduction of spines or reticulate surface. Our species identifications are preliminary at this point, so we use the "cf." for confer in the species name.

Lithologically, our block of limestone does not precisely match any of the rock units listed in the TVA report, nor does it match any of the rocks exposed in the surrounding area to Pickwick Landing. These taxa do not occur in any of the Silurian–Mississippian published literature related the formations in the area. Productids are more common in the Late Paleozoic (Mississippian–Permian); however, there is no Pennsylvanian nearby and no Permian in the southeast, so we should be able to rule those periods out for now. *Dictyoclostus* and *Echinoconchus* are common in Mississippian rocks, especially lower Mississippian; however, they have not been described in any of the Ft. Payne in Tennessee (I have found *Echinoconchus* in northern Alabama in some of my previous work). Additionally, investigation of the nearest outcrops of Ft. Payne to Pickwick have not resulted in finding any of these brachiopods. So, where did these rocks and fossil specimens come from?

We do know that the riprap at the dam was reinforced in 1984, so two possibilities come to mind. Perhaps these riprap blocks, which only occur on the southwest side of the channel and within a confined area, were additional riprap added to shore-up the 1930s riprap during the 1984 work and these riprap blocks were quarried elsewhere in a Mississippian unit (not necessarily the Ft. Payne), probably in Alabama or Mississippi. Or, perhaps the original source of riprap for the 1930s construction was partially from other areas more distant than the actual local quarrying as indicated in the TVA report? Having gone through the 1941 report thoroughly, there is no mention of riprap sources from anywhere other than the local quarrying, but that does not preclude other "less important to document" sources. The blocks we found all seem to occur in a localized area and on the surface of the riprap, so I personally suspect that these blocks were added in the 1984 reinforcement. So far, we have not found any paper trail for that work that discussed riprap, so we may never know the actual source. Anyway, these fossils are in Tennessee now, so now we can claim them as Tennessee fossils, even if they were not necessarily native to our state (and of course, keep in mind that you should not collect from federal property without

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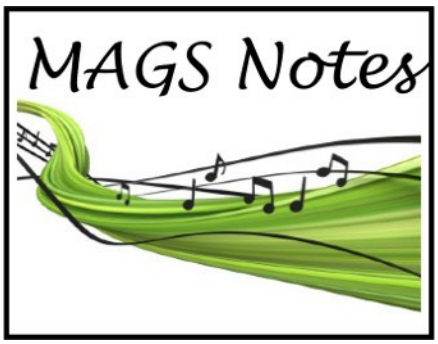
Fabulous Tennessee Fossils Continued from P. 6

permission—however, they remain visible if you visit and will pose for photographs if you want to see inflated productid brachiopods).

Figure 1. Photograph of the lower surface of a dark limestone slab of riprap from Pickwick Landing dam (Photo by MAG; scale in cm). Two species of productid brachiopod are clustered together.

Figure 2. Two species of productid brachiopod from the Pickwick Landing riprap block (Photo by MAG; scale in cm). A. *Dictyoclostus* cf. *inflatus*. B. *Echinoconchus* cf. *alternatus*.

***Editor's Note**: An apology—In last month's issue I incorrectly identified the person in the picture on P. 7. It's Jane Brandon, not Jane Coop. I violated the first rule of journalism: get the names right. My apology to both Janes.*



🎵 Adult Programs

February 11: Jason Schein, "Dinosaur Paleontology in the Bighorn Basin"

March 11: Dr. Roy Van Arsdale, "Groundwater in Southwestern Tennessee"

April 8: MAGS Show

🎵 Junior Programs

February 11: Mike Baldwin, "Fluorescent Minerals"

March 11: Mike Baldwin, "Native American Heritage & Customs"

April 8: MAGS Show

🎵 February Birthdays

9 Vincent Mayer
10 Gypsee McManus
11 Sandy Childress
12 Laura McManus
Louis White
17 Gary Sherman
19 David Vaughn
24 Cheryl Yarbrough
26 Sara Carter
Harrison Parks
27 Leigh Butchko
28 Joy Ashurst

🎵 New Members

Sarah Siegel
Patricia Hewitt

The Membership Renewal Prize winner was Bebe Buck.

🎵 New Library Books

The World of Dinosaurs by Marka Norell

Titanosaur by Florenica Gigena
donated by Jane Coop

Rocks and Minerals of North America by Pocket Guide

Petersonfield Guide Rockland Minerals by Frederick Pough
donated by Christine Lemons

🎵 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 Director shown on the form. If you are 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 *Continued, P. 8*

MAGS Notes Continued from P. 7

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.

Editor's Note: *Normally the December 2021 minutes would have appeared in this issue. However, the November and December 2021 Membership Meetings were combined into the Holiday Open House, and the November minutes were in the previous issue. The December Board Minutes will be in the next issue.*

January Meeting

Photo Credit, Nannett McDougal-Dykes

Show Grand Prize

Jewelry Bench Tips by *Brad Smith*

MAGNETIC TOOL BAR

An easy way to keep all your files organized at the bench is to use a magnetic tool strip. They're not expensive and help keep a lot of small tools from cluttering the bench top. I got a couple of them from Harbor Freight for about $5 each. See http://www.harborfreight.com and search on "magnetic-holder."

My only regret was putting some of my small drills on the magnets. The drills got a little magnetized and now stick together when I carry them in a bottle in my tool box.

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Jewelry Bench Tips
Continued from P. 8

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 components of 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. Firescale and firestain also occur in 14k or 18k gold because of the copper content.

Tarnish is a grayish coating that builds up slowly on the surface due to 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 from air pollution or any other source 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 alloys like brass 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.

There are two ways to prevent firescale. 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. Burning 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 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. Firestain is below the surface, so there's no easy bench tip solution. Depletion guilding may work for some pieces, else 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 amounts of a firecoat. Regular soldering flux will provide some protection but is not as effective as preparations made specifically for the task. Jewelry supply companies offer several commercial solutions, but my favorite is the Prips mixture. I use it every time I intend to do more than two solderings on a piece.

Smart Solutions for Your Jewelry Making Problems

amazon.com/author/bradfordsmith

MAGS At A Glance

February 2022

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
30	31	1	2 Happy Groundhog Day	3 Zoom Board Meeting, 6:30 pm	4	5
6	7	8	9	10	11 Membership Meeting, 7:00 pm, "Dinosaur Paleontology in the Bighorn Basin"	12
13	14 	15	16	17	18	19 DMC Field Trip, Ross Creek, Gruetli-Lager, TN
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27	28	1	2	3	4	5

Memphis Archaeological and Geological Society
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