



# The Mineral Newsletter

**Meeting: September 23 Time: 7:30 p.m.**

Long Branch Nature Center, 625 S. Carlin Springs Rd., Arlington, VA 22204



## Galena on pyrite

Brushy Creek Mine, Oates, Viburnum Trend District, Reynolds County, Missouri

Source: [The Minerals of Missouri](#). Photo: Kevin Conroy.

### Deadline for Submissions

September 20

Please make your submission by the 20th of the month! Submissions received later might go into a later newsletter.

Volume 60, No. 7

September 2019

Explore our [website!](#)

### September Meeting Program:

Fall Club Auction

*details on page 8*

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## Mineral of the Month Galena

by Sue Marcus

Galena is an interesting mineral that many people have collected. How could we have waited for years to devote an article to it? Let's see whether we can all learn something new.

Galena, the primary ore of lead, is a simple chemical compound, lead sulfide (PbS). It was originally named *galen* by Pliny the Elder in about 78 BCE (before the common era).

Common can still be attractive, as galena shows us. Fine cubic crystals occur from micromounts to monsters 10 inches long on a crystal edge.

A case near the entrance to the Gem and Mineral Hall in the Smithsonian's National Museum of Natural History has a spectacular pile of galena cubes. Many times, I've gazed at the specimen and wondered whether I could lift it—if I was even allowed to try, of course.

### Morphology

As with fluorite, the morphology (shapes) of galena crystals can modify each other: cubes can modify octahedrons; and octahedrons can modify cubes, dodecahedrons, and so on.

Although I don't know anyone who does, I suspect that some collectors specialize in collecting galena: you could assemble a beautiful, diverse, and educational collection from the different crystal habits and localities—and, given the weight, it would not be likely to be stolen.

Anglesite, cerussite, and other secondary lead minerals are formed from the chemical breakdown of galena. Traces of bismuth in galena's crystal structure (lattice) can encourage octahedral crystal growth; silver in the lattice can affect the way the specimen fractures, making it break in flaky or bent crumbs or pieces.

Argentiferous galena is the variety that is known to be silver bearing. Silver minerals can also form separate tiny grains in massive or even crystalline galena. The effects of the trace metals were something I learned about while reading about galena for this article.

*Fall is almost here!*



### Northern Virginia Mineral Club members,

Please join your club officers for dinner at the Olive Garden on September 23 at 6 p.m.

*Olive Garden, Baileys Cross Roads (across from Skyline Towers), 3548 South Jefferson St. (intersecting Leesburg Pike), Falls Church, VA*  
Phone: 703-671-7507

Reservations are under Ti Meredith, Vice-President, NVMC. Please RSVP to me at [ti.meredith@aol.com](mailto:ti.meredith@aol.com).



*Galena, Petrovitsa deposit, Borieva Mine, Madan orefield, Rhodope Mountains, Smolyan Oblast, Bulgaria.*  
Photo: Bob Cooke.



## Occurrence

In the United States, the largest galena deposits are in the Mississippi Valley, known as Mississippi Valley Type (or MVT) deposits. They include the Tri-State District of Kansas, Illinois, and Missouri; the Viburnum Trend District of Missouri; and other mining areas north to Wisconsin. The MVT features lead–zinc  $\pm$ –copper (primarily as galena–sphalerite  $\pm$ –chalcopyrite) deposits. The same type of deposits has now been identified on most continents.

These deposits formed at relatively low temperatures when mineralized waters intruded into calcareous sedimentary rocks (limestone or dolostone, a rock made up of dolomite). The upwelling fluids, saturated with metals, interacted with saline ground waters to precipitate fluorite and barite. The limestones contained natural joints and fractures that the fluids could penetrate. There is some evidence of preexisting caves and voids that became fluid traps.

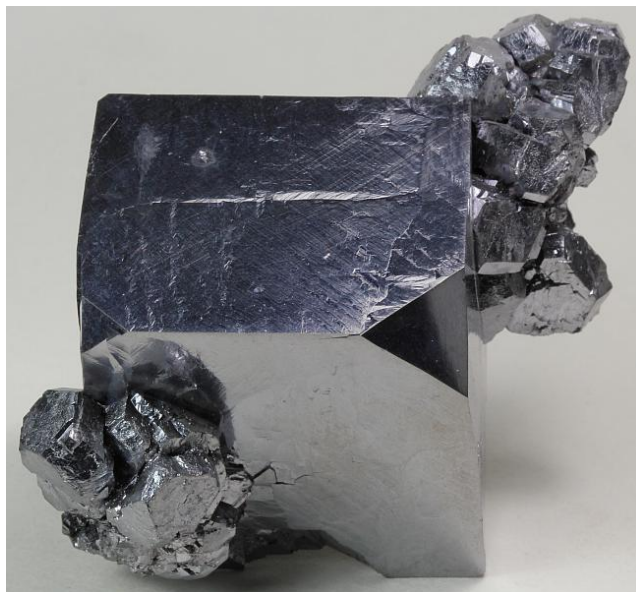
The MVT deposits often formed in cherty limestones. The limestones dissolved, and the cherts that were left formed porous breccias amenable to the infusion of metal-bearing hydrothermal fluids. As the fluids reacted chemically with the preexisting rock, they evolved and cooled over time. The result was fractionation, with some minerals forming early and others later on.

Galena replaced the calcareous host rock in veins containing fluorite, barite, calcite, chalcopyrite, and sphalerite. Most veins are massive, although vugs (cavities) can be lined with stunning crystals in various combinations of minerals.

Other types of galena deposits, such as those in the Laisvall District in Sweden, formed under similar conditions but in clastic rocks like sandstone. The hydrothermal fluids can cause brecciation in both types of deposits, although replacement of the host rock occurs only in the MVT deposits.

Most galena deposits are strata bound, meaning that the upwelling fluids reached a nonreactive rock formation and spread out horizontally at the time of deposition. Later tectonic events could change the shape of the deposits, making exploration and mining more difficult. The tectonic events could cook the host rocks, turning them into skarn (a metamorphic rock).

Galena is common in metamorphosed volcanic deposits when existing rocks got caught in the processes that



*Galena, Brushy Creek Mine, Oates, Viburnum Trend District, Reynolds County, MO. Source: Conroy (n.d.); photo: Kevin Conroy.*

heated and squeezed the rocks. All galena deposits in Canada are hosted by metamorphic rocks; the crystals are gone but the galena is still there. Skarns are caused by hot intrusive rocks that punch up through limestones. Contact metamorphism emplaces disseminated minerals, and the cooling that follows pulls the minerals back in and concentrates them into large masses. The intrusives are mainly in the granite family.

Galena is also found in geologic environments where an igneous intrusion (such as granite) caused the deposit's hydrothermal source fluids. I found passing mentions of galena in basalt and diabase, both mafic igneous rocks. However, I couldn't find any elaboration or confirmation of such unusual occurrences.

One source describes fibrous or platy galena, although such occurrences are highly unusual, at least in macro-specimens (specimens you can see, not micromounts).

I also came across a novelty—galena pseudomorphs after pyromorphite. Classic specimens from Germany's Kautenbach Mine are evidently rare, since the price I saw on one was \$15,000! To me, it looked like regular cubic galena. Other galena pseudomorph specimens come from Cornwall in England. Such specimens might well appeal to pseudomorph collectors—or to collectors who specialize in galena.

Is the “snow” or “frost” on Venus really galena? Some sources suggest that it might be. The material could

also be tellurobismuthite ( $\text{Bi}_2\text{Te}_3$ ) or coloradoite ( $\text{HgTe}$ ), although the most recent source I could find (from 2015) suggests that it is most likely to be a “ferroelectric material.” The earlier results (from 2013) were from low-resolution radar altimetry, whereas the more recent analyses relied on synthetic aperture radar and stereo radar elevation data.

### Early Uses

The word “plumbing” and the chemical symbol for lead (Pb) both come from the Latin word for lead, *plumbium*, the material from which pipes were made. Because processing it is easy, galena might have been the first ore from which metal was extracted.

Lead from galena has been used since at least 6500 BCE, with the oldest artifacts being statues and beads found in what is now Turkey. Ancient Egyptians used lead-based cosmetics to protect their eyes from insects and the harsh sun. Egyptian pharaohs had lead pipes for plumbing. A lead glass recipe has been dated to 1700 BCE. In China, the Han Dynasty (206 BCE–220 CE) used lead in glass to mimic jade. The ancient Greeks and Romans recognized that galena could contain silver and devised effective separation processes to extract silver from the lead ore.

Since at least the 17th century, Native Americans—the Meskwakis (Fox) in what is now eastern Iowa and western Wisconsin—ground up galena for facial paint, much like the ancient Egyptians did. They kept the locations of the galena from the French and later English trappers and traders, instead trading chunks of galena to the Europeans. The Europeans processed the galena into lead shot that was traded back to the Meskwakis.

The Meskwakis grew to trust Julian Dubuque, a French-Canadian trapper who married a Meskwaki



*Galena cube on marcassite, Brushy Creek Mine, Oates, Viburnum Trend District, Reynolds County, MO. Source: Conroy (n.d.); photo: Kevin Conroy.*

### Galena Educational Puzzler

Here is an educational mindbender using galena.

Hold a small piece of galena in one hand and a large piece of pumice in the other. Ask someone (a noncollector) which is heavier. Most people will pick the larger chunk (the pumice), which is light due to the air it contains.

You can then talk about density (“heavy as lead”) compared to mass (the larger piece of pumice).



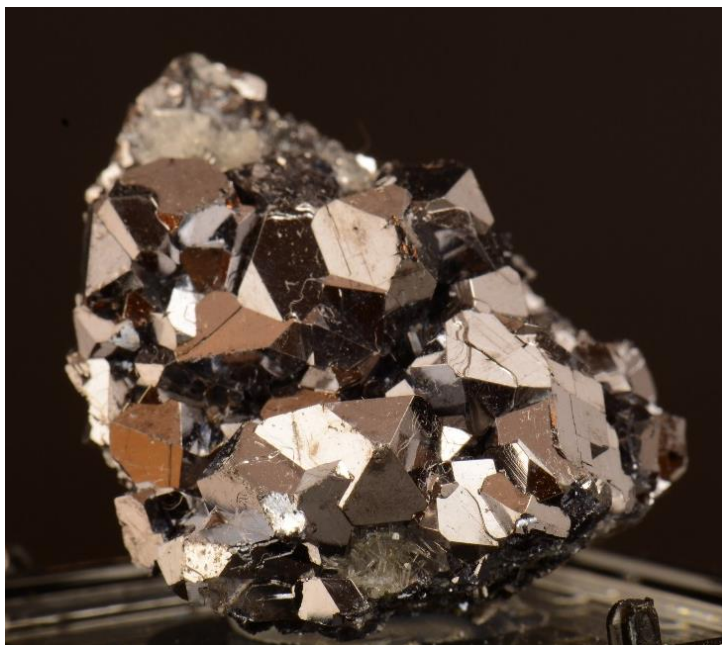
woman. They showed him their deposits and gave him control of their mines. The Meskwakis and Dubuque explored and worked lead deposits cooperatively until his death in 1810, when the lands were supposed to be returned to the natives.

Instead, the U.S. Army seized the lead deposits. A lead rush began in the early 1820s, although miners had to turn 10 percent of the lead ore they mined over to the Army. The rush ended when the miners dug deep enough to strike ground water; pumping out the water made mining unprofitable.

### Sources

MVT deposits in Missouri include the Viburnum Trend District, with the Brushy Creek Mine and the West Fork Mine. In the Tri-State District of Illinois, Kansas, and Missouri, galena replaced calcareous rocks to create deposits in localities such as Joplin, MO, and Picher, OK.

The last mine in the Tri-State District closed in Kansas in 1970 due to environmental and economic problems. In the 1960s, galena mining contaminated the air as well as ground and surface waters on ancestral lands of the Quapaw Tribe in Oklahoma. In northeastern Oklahoma’s Grand Lake of the Cherokees, fish advisories continue to this day. The Tar Creek Superfund Site was declared in the same area in 1983.



*Galena, Petrovitsa deposit, 9th of September Mine, Madan orefield, Rhodope Mountains, Smolyan Oblast, Bulgaria.  
Photo: Bob Cooke.*

Galena is the state mineral of Kansas, Missouri, and Wisconsin. Towns in Kansas and Illinois bear the name Galena for lead ore mined there. Wisconsin earned its nickname as the Badger State because miners in the 1820s were prospecting for galena in the southwestern part of the state. They didn't take time to build houses, instead burrowing into hillsides or living in mine tunnels, dwelling underground like badgers. The miners were sometimes called "badger boys," and the nickname spread to the whole state.

Some of us have had the pleasure of visiting Leadville, CO, which was established after galena was discovered nearby. Other famous Colorado mining districts like Ouray and Central City also produced galena as well as specimens for collectors. Silverton got its name from the highly argentiferous galena mined nearby.

More unusual U.S. localities for galena include Wurtzboro, NY, and Shullsburg, WI. Idaho's Coeur d'Alene Mining District was rich in silver, much of which came from galena, although other silver-bearing minerals were found there too.

In 2018, five Missouri mines still produced lead, along with a total of five mines in Alaska, Idaho, and Washington. Along with newly mined ore, recycling of batteries and other lead products is an important source of lead in the United States.

Peru has been an abundant source of galena in wonderful, diverse crystal forms, often together with other metallic minerals. Galena comes from mines in the Huarochiri, Huancavelica, and Pasco areas of Peru, among others. The specimens are usually untarnished, brilliant pieces. Peruvian specimens can be found in prices fitting any collector's budget.

Mexico produces galena crystals from Naica and Mapimi. China is the world's largest lead producer (at about 2,100 metric tonnes per year), with Australia in second place, though far behind (at about 450 tonnes).

In Weardale and Alston Moor, England, galena and fluorite form classic, beautiful specimens. The largest known galena crystal, 10 inches on each edge, comes from England's Isle of Man, not a noted collecting locality.

From continental Europe, notable galena occurrences come from the Black Forest, the Harz Mountains, and Siegerland in Germany. Trepca in Serbia and the Maramures region of Romania also feature galena mines.

*Collectors beware:* skeletal galena that seems to be etched might have been intentionally altered by unscrupulous sellers. Galena crystals from the Rhodope Mountains, Madan, Bulgaria seem to be the ones most frequently altered, particularly those from the 9th of September Mine (see, for example, Haynes 2009).

### **Processing Galena**

Galena is often found with copper minerals (chalcopyrite, tennantite, and tetrahedrite), zinc minerals (sphalerite and hydrozincite), and secondary lead minerals like cerussite, along with "gangue" (noneconomic) minerals like calcite. In certain geologic environments, galena deposits may contain up to 20 percent silver, making them a valuable silver ore.

### **Collector's Tip**

The Minerals.net website offers a collector's tip for improving the looks of tarnished galena specimens: using water and mild soap. However, galena specimens can be brittle or have begun to corrode, so they should be handled with care. Another source indicates that hot water can crack specimens (due to expansion and contraction during heating and cooling), so wash gently.



Pyrite can pose a processing problem, but if it contains sufficient gold, the value of the gold and the value of the silver contained in the galena can cover the mining costs, leaving lead, copper, and zinc products as profits. Deposits composed mostly of galena, chalcopyrite, and sphalerite (like the specimen shown on the right) can be economically viable if there is enough silver in the galena and enough gold in the pyrite.

However, the arsenopyrite found in some deposits poses severe processing problems. The market for arsenic is not as large as the markets for precious metals and for base metals other than lead. Moreover, the disposal of arsenic is difficult because it is a toxin.

### Uses of Lead Today

Batteries, including vehicle batteries, are the leading use of lead in the United States. Lead is also used in bullets and fishing sinkers. Lead is used as a shield from radiation in television and other screens or when we have medical x-rays or other diagnostic tests like CAT scans: the apron draped over you by the technician contains lead. Lead liners also seal radioactive chambers.

Was galena used in “lead” pencils, which are now made of wood, clay, and graphite? Sources differ. Some say never, others say it happened long ago.

In the United States, lead from galena was used in early electronic devices. Throughout history, lead has been used as a glaze for pottery, and lead was formerly used



*Calcite and galena, West Fork Mine, Centerville, Viburnum Trend District, Reynolds County, MO. Source: Conroy (n.d.); photo: Kevin Conroy.*



*Galena with chalcopyrite, sphalerite, and other minerals, Primorskiy Kray, Russia. Source: [Smithsonian Museum](#); photo: Chip Clark.*

in paints to make the coating opaque and durable and to accelerate drying. Since antiquity, lead has also been used in plumbing. Older buildings and water systems still contain lead.

Such uses have long since ceased because lead in the environment is toxic to humans and many other living organisms. In children, excessive lead absorption affects brain development.

The Clean Air Act of 1970 was, in part, a response to the inadvertent discovery of lead pollution in the environment. A scientist was trying to calculate the age of the Earth using a process that required pure natural environments, including lead-free air. She couldn't find any because lead mining in the United States had spread lead into the atmosphere across the nation. Lead mines, especially in the central United States, have left environmental legacies that include pollution from waste dumps, radon, and other toxins like lead in dust.

Accordingly, some states now have buyback programs for potential lead pollutants such as bullets and fishing sinkers. Lead is no longer used to solder food cans (although solder from metals other than lead can create its own problems). In the United States, gasoline no longer contains lead. Pewter, an alloy of tin and other metals, used to contain lead, possibly at toxic levels, although modern pewter that might come into contact with food rarely contains lead.

Another previous use of lead was to make “crystal” for high-quality and high-priced glassware (for example Waterford Crystal) or chandeliers. Lead glass is heavy and refracts light so that it sparkles brightly. Lightly striking the rim of a leaded wine glass causes a unique ring. The brilliance (refractivity) and tone (sound) of leaded glass are directly due to the lead. ↗

## Technical Details

Chemical formula .....PbS  
 Crystal form.....Isometric  
 Hardness .....2.5  
 Density.....7.4–7.6  
 Color .....Gray, silvery when fresh;  
                   dark gray sometimes, with white to orange al-  
                   teration crusts  
 Cleavage .....Three perfect, at 90° angles  
 Fracture .....Brittle, subconchoidal  
 Luster.....Metallic when fresh or not  
                   tarnished; dull and darker when tarnished  
                   (with further color change if chemical altera-  
                   tion is occurring or has occurred)  
 Streak.....Gray-black

## Acknowledgments

I would like to thank my husband, Roger Haskins, for his helpful review and additions and Hutch Brown for his skillful editing.

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*Galena, Indian Creek Mine, Ebo, Viburnum Trend District, Washington County, MO. Source: Conroy (n.d.); photo: Kevin Conroy.*

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## Club Member Rocks and Minerals Auction Coming Up! September 23 Program

Our March club meeting will feature our Fall Club Auction! Proceeds from the auction go into the Fred Schaefermeyer Scholarship Fund, which supports students in the field of geology.

The meeting will start promptly at 7:30 p.m. (*note*: this is 15 minutes earlier than usual). We will quickly move through the business part of the meeting so we can get to the fun!

Sellers, come early to help set up the room and your items. Each auction item should be described on an individual bid slip (see page 21 for the form—just print out as many pages as you need). Information on the bid slip should include:

- item number (your initials or other unique code followed by a sequence number);
- description;
- from (locality); and
- starting bid amount (the lowest bid you will accept for sale—if not stated, the minimum bid is \$2).

Also, use the summary sheet on page 22 to list all of your items for sale so that the Treasurer can record the final sales price and give you your money after the auction.

Bring guests or invite nonmembers who might be interested in rocks and minerals! Although only current club members are allowed to sell, the meeting and auction are open to all.

Please consider volunteering. The auctioneers, accountants, and runners are all volunteers—so help us out here, folks!

Bring small bills, bid early and often, and help us move on to the next item. We need to be out of our meeting room by about 10 p.m.

### **\*\* Note Current Club Auction Rules \*\***

- Any member may offer up to 20 specimens or up to 4 flats for auction.
- Each flat is one auctionable item.
- The club gets 15 percent of the purchase price; the remainder goes to the seller.

- Anyone may donate items to the auction to fully benefit the club (no money goes back to the donor).
- The minimum bid is \$2 on any item. The minimum increase is also \$2. Bids higher than \$20 increase by \$5.
- We start with a silent auction to assess interest in each item for sale. So look carefully and start bidding. Items with multiple bids during the silent auction will be brought sooner to the actual (vocal) auction.

Winning bidders must pay for the item promptly, with cash or check. ↗.

## President's Collected Thoughts

*by Sue Marcus, President*

I look forward to seeing you at our September auction—remember to fill out the auction sheets and bring small bills (\$). Come early to bid and share summer stories! I hope you had some summer fun.

Roger and I had an overly exciting trip to visit his family in Michigan, including a 2 a.m. hotel fire and a storm that blew out power and water.

Plans for a club summer collecting event melted in the heat—almost literally. When contacted, those who know best suggested that it would be too hot to be enjoyable, so we'll wait for cooler weather.

Here's a club conundrum: What do we do with the club library?

Many of you may not even know we have a club library. It is hidden—some might say buried—in the closet in our meeting room at the nature center. I'm unaware of any additions in the past several years.

Most of us now look to the internet for our research, although books can be useful references when the web is unavailable. Still, some of the volumes in our collection are probably out of date.

By our September meeting, I hope to have attempted to organize the closet, with the help of other volun-





teers. I propose that I identify books for disposal (deaccession, I believe, is the library term), which could be done as part of our November NVMC show auction or at another event.

Other ideas about our library are welcome! Please drop me an email or give me a phone call to share them.

For worthwhile, pleasurable reading about geology, it's hard to beat the books by John McPhee, like *In Suspect Terrain* (1983), *Basin and Range* (1981), and several others. Hutch Brown asked me whether I thought McPhee was truly a plate tectonics skeptic, at least when he wrote *In Suspect Terrain*.

Let's check our understanding of "terrane" and "terrain" first. A terrane is a block of fault-bounded rocks that are distinct from the surrounding rocks. Terrain, in geological usage, is a relatively uniform rock formation; in topography, it is a land descriptor (as in "hilly terrain"). I think McPhee's book should have been titled *In Suspect Terrane*.

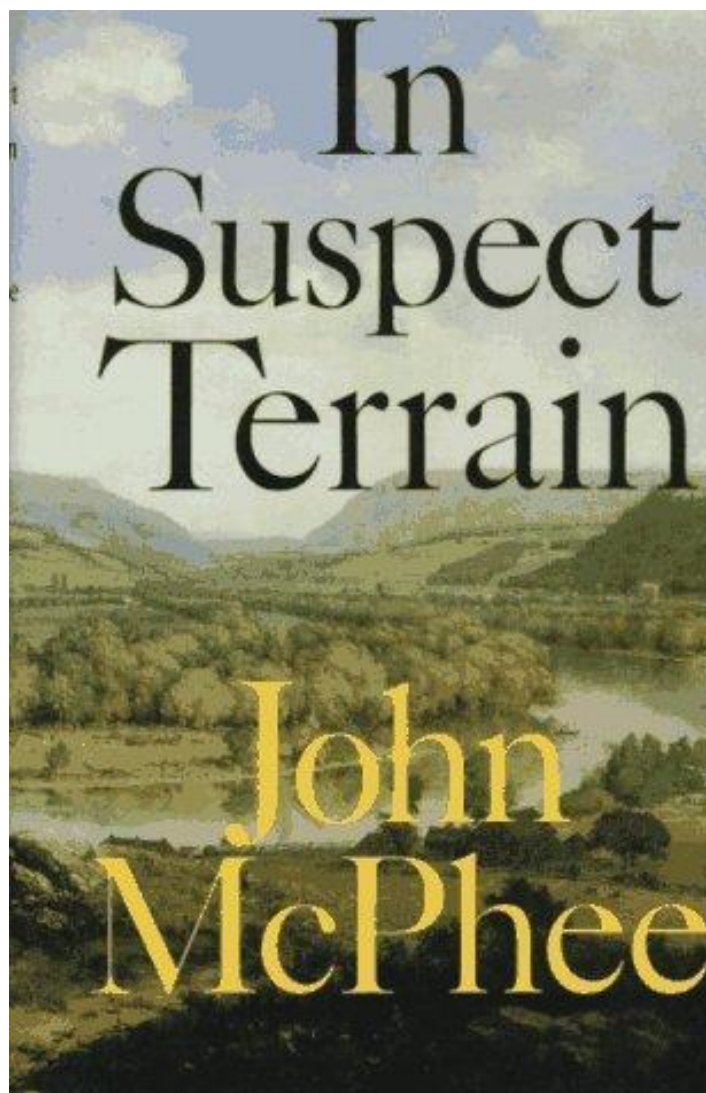
"Suspect terrane" is geology jargon. My definition is regional swaths of rocks pasted on to other areas, far from their origins (accreted)—like parts of the East coast being geologically glued on from proto-Europe or other continents before the continents we have now.

I don't think—especially by now—that McPhee is a plate tectonics skeptic. I think the term suspect terrain simply grabs one's attention and therefore helps sell books.

When Roger did graduate work in Manitoba (in 1973–74), two fairly eminent geologists held a formal debate on plate tectonics. Even then, skepticism was on its way out (other than from those who also don't believe in evolution and so on). The professor who took the anti-plate-tectonics position did it intentionally, knowing that he had a tough job to defend it scientifically. I mostly recall the pleasure of watching the professors argue!

After someone gave me one of McPhee's geology books, I was hooked. It is *real* geology, well written, accessible to everyone. McPhee wrote about David Love, a USGS geologist, in *Rising From the Plains* (1986). Dr. Love spent much of his life in Wyoming, and I went to field school in his neck of those nonwoods.

I spotted a *Washington Post* obituary for someone who seems to have been David Love's brother and figured out how to send David the piece. He replied, and we



*The book cover is from an 1859 painting of the Delaware Water Gap, where the Delaware River cuts through Kittatinny Mountain in New Jersey. The author traversed such landscapes with geologist Anita Harris, who said that understanding what made such scenes possible does much to explain the history of the East coast.*

had some minor correspondence. He cordially invited me to visit if ever I got out that way.

All due to John McPhee's wonderful writing!

Read McPhee—it can take you places and help you make connections. ↗

Sue



## Meeting Minutes June 24, 2019

*by Rick Reiber and Sue Marcus on  
behalf of David MacLean, Secretary*

**P**resident Sue Marcus called the meeting to order at 7:50 p.m. at the Long Branch Nature Center in Arlington, VA.

### Introductions/Acknowledgments

Guests Dookie Broussard, Charlotte Caldwell, Jaiden Crow, Savannah Crow, Almas Eftekhaki, Miranda Gardener, and Kathy Leader introduced themselves. Charlotte and Kathy graciously donated a collection of minerals and geology-related books belonging to a deceased family member to the club for a future auction and for the Kids' Mini-Mines at the annual club show. Dookie, Jaiden, Savannah, and Miranda are actually members, but because they live in Pennsylvania, this was the first time they could join us at a club meeting.

Past presidents Bob Cooke, Rick Reiber, and Barry Remer were recognized.

### Presentation: Pegmatite Minerals

In the lively presentation that followed, Scott Duresky showed images of minerals from the historic Rutherford Mine #2 near Amelia Court House, VA. Most of the minerals shown were extremely rare, and almost all were micromounts. Some were new and yet to be formally approved.

Scott has done extensive research on the minerals from the Rutherford locality, which he visited at least 100 times between 1968 and 1978. He coordinated his research with Mike Pabst and in some cases with professionals like Dr. Mike Wise of the Smithsonian Institution.

Scott credited Pete McCrery as his primary mentor. Pete collected many specimens from the Rutherford Mine #2 and gave them to Scott as a living legacy. Scott shared some of that bountiful legacy as bonus door prizes—unexpected treats for young and old(er) recipients who will never have the opportunity to collect at this closed locality.

Special thanks to Harry, who stepped in to run the PowerPoint slides for Scott!



*Microlite from Rutherford Mine #2 near  
Amelia Court House, VA.*

### Door Prizes

Vice-president Ti Meredith announced the door prize winners, with Scott Duresky generously passing out bonus prizes from his Rutherford pegmatite minerals to the winners. Door prize winners were Linda Benedict, Tom Benedict, Jaiden Crowe, Harry de Beer, Pat Flavin, Miranda Gardener, Elijah Kim, Michael Palaschak, and John Weidner.

### Business Meeting

May meeting minutes were approved as published in *The Mineral Newsletter* with one addendum: Jeff Guerber should have been on the list of door prize winners (see his article on his May door prize on page 14). Our May speaker, Paul Kreingold, joined the club—we hope that starts a trend!

New business included announcement of results from the 2019 Bulletin Editors Advisory Committee contest for newsletter articles. Our newsletter editor, Hutch Brown, presented award certificates to winners in attendance, including Linda Benedict and Sue Marcus. Two of the winners, Grant Colip and Noah Fleischer, are James Madison University students and recipients of NVMC student scholarships.

Full results of the 2019 contest for our club are on page 15. Kudos to all our contest participants, and thanks to Hutch for submitting their articles.

### Announcements

Dave Fryauff brought up the June 29 field trip to the National Limestone Middleburg Quarry #1 and the Mt.

Pleasant Mills Quarry #2, both in Pennsylvania. Both field trips were arranged by him and hosted by GLMSMC. This could be the last trip to a long-term source of strontianite (fluorescent), calcites, and other nice crystallized specimens because the owner told Dave that he's retiring and his family or future owners might not be willing to welcome collectors.

Sue Marcus mentioned that she'd heard that the owners of the Sweet Home Mine, famous for its rhodochrosite, have probably discovered an extension of the "ore" zone.

### Display Tables

Several members brought specimens to show off or for help with identification. Germaine Broussard brought some big ones for identification—members helped with that. (She also brought her family to help with the hauling.) New member Claire Nykolyszyn showed off finds from the recent kyanite field trip—it was good to have a report on that from a participant! Pat Flavin told us about her experiences at a North Carolina emerald mine that is currently a buy-a-bucket operation, with salted buckets. New member Norma de Beer brought a mako shark's tooth (identified by Pat Flavin). The display tables had giveaways from local and Pennsylvania quarries, generously donated by Dave Fryauff.

↗.

### Humor

#### Unwanted Garnet

*Editor's note: The story is adapted from [Humorous Mineral Stories](#) on Mindat.*

**M**any years ago, my husband and I spent a day collecting at the Ruggles Mine in New Hampshire. Toward the back of the quarry, I found a large rock made of loosely interlocking almandine crystals. My husband broke it into smaller pieces, all of which showed good, large crystal faces. While breaking up the rock for specimens, a piece rolled down the slope into a large puddle, and we left it.

A few years later, I burst out laughing when I saw the same specimen on Mindat! It was the piece from the pond (you can see it [here](#)), and we were glad someone else was enjoying it! ↗.

### Bench Tip Polishing Wheels

Brad Smith

In the finishing sequence, there's a step called prepolishing (between sanding and buffing). One of the most effective tools I've found for this is the little silicone wheels used in a freedom or dremel. They come at several different abrasive levels and in several different shapes. The wheels are color coded to denote their abrasive level. Different shapes (coin, knife, cylinder, point, and so on) are available to match the geometry of the area being cleaned up.

For starters, I'd suggest a medium, a fine, and an extra-fine wheel in both the coin shape and the knife-edge shape. Be sure to get a few extra mandrels so you'll have one of each wheel shape mounted and ready to go.

The thicker coin shapes are particularly handy. Cylinder shapes are nice for doing the inside of rings, and knife-edge shapes quickly clean up the solder joint around the outside base of your bezels.

Most jewelry catalogs carry these wheels, but often the color codes don't match between different manufacturers.

See Brad's jewelry books at  
[amazon.com/author/bradfordsmith](https://www.amazon.com/author/bradfordsmith)







## You Won't Find Wonder on Twitter: You Have to Dig for That

by David Von Drehle

**Editor's note:** The source is an op/ed piece in The Wash-

ington Post (April 9, 2019). Thanks to Sue Marcus for the reference!

These are the days of miracles and wonders, as Paul Simon once sang. News of one such marvel took me on a bright spring morning to the paleontology labs of the University of Kansas in Lawrence. There I found myself looking with awe at the fossilized bones of an ancient paddlefish.

We could profitably spend time reflecting on the miracle of spring mornings, of paddlefish, of life itself—for these all seem rare indeed, at least in our known corner of the universe. What had me thunderstruck, though, was not the life of that fish but its death. Tiny beads of glass caught in its gill rakers suggest the creature perished while gasping for air as fire rained from the sky. The composition of those beads, or tektites, further suggests that they were formed when a massive asteroid slammed into the Earth with the force of 10 billion Hiroshimas and ended the Cretaceous period. [Read more.](#)

## Changing Word Meanings

by Richard Nordquist

**Editor's note:** The article is excerpted and adapted (with apologies to the author) from the *S.C.R.I.B.E.* bulletin (March/April 2019), p. 8.

“You keep using that word,” Inigo Montoya tells Vizzini in *The Princess Bride*. “I do not think it means what you think it means.”

The word so frequently misused in the film is “inconceivable.” But other words can also hold different meanings for different people—or meanings that change over time.



## NVMC End-of-Summer Picnic!



September 14, 12–4 p.m.

Lake Jackson

11680 Temple Loop, Manassas

On the lake, so bring water gear!

Potluck ... club provides hamburgers/hotdogs, trimmings

RSVP to Ti Meredith, [ti.meredith@aol.com](mailto:ti.meredith@aol.com)

Save the dates!

## Desautels Symposium

63<sup>rd</sup> Annual Paul Desautels Micromount Symposium

October 11–13, 2019

Friends School of Baltimore

5114 N. Charles Street

Baltimore, MD 21210

Giveaway tables, silent auction, voice auction, sales, mineral talks, trading, lots of friends

For program and registration forms, contact:

Mike Seeds, [mseeds@fandm.edu](mailto:mseeds@fandm.edu)

Take the adverb “literally,” for example: it means “in a literal or strict sense—word for word.” But many people now use it as an intensifier. In 2008, former Vice President Joe Biden predicted in a speech that the next President of the United States would have “an incredible opportunity not only to change the direction of America but literally, literally to change the direction of the world.”

Literally? Did he mean like in that movie when Superman flew around the world so fast that the Earth literally changed direction, somehow reversing time? A U.S. President can literally *do* that?

To speak literally, today’s hyperbolic usage of certain words literally erodes their meaning. ➤



## What's New in the Mineral World?

by Thomas P. Moore

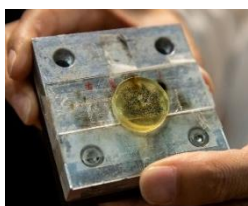
**Editor's note:** The source is The Mineralogical Record, August 2019, with the latest installment of a popular column on new mineral offerings online. Thanks to Roger Haskins for the reference!

**M**idsummer in Tucson—triple-digit heat, blistered roads with lethargic traffic, not too many people around—and those ice-cream-scoop cumulus clouds piling up in the sky might offer some hope of a monsoon storm in the late afternoon. But meanwhile the relentless mineral collector goes to his desk (instead of relenting) and interrogates his computer for news concerning ... What's New on the Web! [Read more.](#)

## Stolen Specimen Alert!

**Editor's note:** The source is The Mineralogical Record. Thanks to Roger Haskins for the reference!

**M**ultiple valuable specimens were stolen from the University of California at Santa Barbara, including aquamarine, beryl, cinnabar, diamond, gold, opal, rhodochrosite, topaz, legrandite, mimetite, pyrargyrite, serandite, and tanzanite. The [alert](#) shows images of each stolen item and tells you who to contact in case you see one.



## New Analysis Techniques Unearth a Trove of Unusual Minerals

by Sophia Chen

**Editor's note:** The source is Science (July 1, 2019). Thanks to Sue Marcus for the reference!

**T**he landscape of Kamchatka Peninsula steams with sulfurous vapor, its 29 active volcanoes forming a hazy backdrop for the region's herds of reindeer and rivers of salmon. One of the most geologically active places in the world, Kamchatka juts out from the eastern coast

of Russia to resemble a larger version of Florida. A process almost like alchemy occurs here: like a set of roiling cauldrons, Kamchatka's volcanoes mix unusual combinations of atomic elements to forge minerals that are unlike anything anywhere else in the world. [Read more.](#)

## Giant 552-Carat Yellow Diamond Unearthed in Canada's Arctic

by Cecilia Jamasmie

**Editor's note:** The source is Mining.com (December 14, 2018). Thanks to Sue Marcus for the reference!



**C**anada's Dominion Diamond Mines and Rio Tinto shocked the market on Friday by unveiling what is believed to be the largest diamond ever found in North America, about the size of a chicken-egg. The 552-carat yellow gem-quality stone, unearthed in October 2018, measures around 3 by 5.5 centimeters, almost three times the size of the next largest stone ever found in Canada, Dominion—which owns 40 percent of the mine—said in the news release. [Read more.](#)

## GeoWord of the Day

(from the American Geoscience Institute)

### tectono-eustasy

Worldwide change of sea level produced by a change in the capacity of the ocean basins owing to plate tectonic motions, such as seafloor spreading and subduction. Term introduced in 1961. See also: *glacio-eustasy*; *sedimento-eustasy*. Synonyms: *diastrophic eustatism*; *tectono-eustatism*.

(from the [Glossary of Geology](#), 5th edition, revised)

## Researching a Specimen With a Historical Label

by Jeff Guerber

**Editor's note:** The article is adapted from *The Mineral Mite* (newsletter of the Micromineralogists of the National Capital Area, June 2019), p. 4.

My ticket was drawn for a door prize at the May 2019 meeting of the Northern Virginia Mineral Club. After considering the available specimens, I selected one (pictured at right) identified as uvarovite from Quebec.

The specimen is about  $4 \times 3.5 \times 3$  centimeters in size, largely covered with bright green crystals that are tiny (mainly less than 1 millimeter in size) and equant (equal in diameter in all directions). It certainly looks like uvarovite!

The accompanying label is old—handwritten on the back of a flier for the EFMLS show in Newark 1 (pre-dating zipcodes!), NJ, June 25–28, 1964. In the lower left, the flier even offers “Direct Transportation to WORLD’S FAIR”!

The first line of the label (in pen) reads “Uvarovite—green—also Quebec but not Montanbaut.” The second line (in pencil) reads “it’s from Bramton.” (The number 405 is also written on the label, presumably the original owner’s catalog number.) The second line looks a little different from the first and the writing is larger, but in closely comparing the letters, I think they are in the same hand.

Hmm. I wonder where Bramton, Quebec, is? Or Montanbaut?

A locality search in Mindat didn’t produce any hits, and the closest match that Google Maps and Wikipedia came up with was a Brampton, Ontario, near Toronto. But the only Bramptons in Mindat are in Michigan, South Africa, and the United Kingdom.

Searching for uvarovite from Quebec turned up three localities, including the Jeffrey Mine in Asbestos, but none seemed plausibly to be “Bramton.”

Somewhere, though—I haven’t been able to reconstruct how—I came across a mention of Lac Brompton, Quebec, which is a few miles east of Sherbrooke. And searching Mindat for Brompton turned up the Orford Nickel Mine in the town of St-Denis-de-Brompton, which is on Lac (Lake) Brompton. According to Mindat, the Orford mine is “[f]amous for excellent



**Top:** Detail of a specimen from the door prize drawing at the NVMC meeting in May 2019, labeled as uvarovite but probably green grossular. **Bottom:** Back side of the original specimen label. Photos: Kathy Hrechka.

specimens of diopside, green grossular (chrome-bearing), orange grossular, and millerite.”

Green, chromian grossular!

One reference pointed out that older specimens of green grossular were commonly mislabeled as uvarovite. My specimen also contains some bladed straw-colored crystals, which are likely to be diopside.

The Orford mine operated only from 1877 to 1882, but minerals are still found on the dumps. So I think it’s highly likely that I have green grossular with diopside from the Orford Nickel Mine in St-Denis-de-Brompton, Quebec, with an interesting old (if incorrect) label. I’ll have to make a new one, with a note about what I’ve found.

It turned into a fun research project! I never did find Montanbaut, but one forum discussion I came across



complained that Quebec has many place names that are no longer in official use. ➤

## Sources

Mindat. 2019. [Orford Nickel Mine, St-Denis-de-Brompton, Le Val-Saint-Francois RCM, Estrie, Québec, Canada.](#)

Mindat. 2019. [Photo gallery: St-Denis-de-Brompton, Le Val-Saint-Francois RCM, Estrie, Québec, Canada.](#)



## 2019 Newsletter Contest Results

by Hutch Brown, Editor



Each year, the regional and national club federations hold a contest for newsletters from the previous year. The 2019 contest winners reflect newsletters and articles from 2018.

For complex reasons, the 2019 contest also included newsletters and articles from 2017, and it didn't include all of 2018. I won't bore you with the details, but normally it's the calendar year.

Our club has participated in the contest ever since I joined in 2012. Until 2017, we submitted both sample newsletters and individual articles for judging in the contest. In 2017, we won the regional first-place trophy for newsletters. First-place newsletters are disqualified from competing in the region for the next 2 years, so we haven't been submitting newsletter samples for the contest.

Our newsletters typically exceed the 20-page limit for large newsletters in the contest, so we might not be submitting in the future, either.

However, we did enter articles in four categories for the 2019 contest:

- **Technical/educational articles** incorporate, for example, "historical or geological information." They are short research pieces.
- **Nontechnical articles** are "informational rather than technical" in nature. How do you tell the difference? Got me! I flip a coin.
- **Written features** "add spice." For example, they might be a personal story or a book review.
- **Original poetry, adult**, submissions are self-explanatory. I have been editor since 2013, and we

have never had a poetry submission during all that time—until now!

The regional federations are the first to judge the submissions. They send the top three winners in each category on to the AFMS for the national contest. The category for Written Features is an exception because the national federation contest doesn't have it.

At the regional (EFMLS) level, our club's submissions placed as follows:

### Technical/educational—

**Third place:** Mike Kaas, "Profile of the Kennecott Mine in Alaska" ([January](#))

**Fifth place:** Sue Marcus, "Mineral of the Month: Rhodonite" ([December](#))

**Seventh place:** Sue Marcus, "Mineral of the Month: Pyrrhotite" ([January](#))

### Nontechnical—

**Fifth place:** Noah Fleischer, "A Very Cool (and Easy-to-Access) Maryland Copper Mineral Locality!" ([June](#))

**Honorable Mention:** George Loud, "Mineralogical Reflections: Magnet Cove, AR—Memphis, TN—Spruce Pine, NC—Franklin, NJ" ([September](#))

**Honorable Mention:** Mike Kaas, "Virginia Gold Mining and Hornet Balls" ([October](#))

### Written features—

**Fifth place:** Mike Kaas, "Tsumeb Followup" ([December](#))

**Seventh place:** Grant Colip: "Traveler's Delight: Amethyst Treasure" ([April](#))

### Original poetry, adult—

**Third place:** Linda Benedict, "Gemming at Leisure" ([October](#))

Our club's submissions did well enough to advance in two categories from the regionals to the nationals. In the national (AFMS) contest, we placed as follows:

**Ninth place, technical/educational:** Mike Kaas, "Profile of the Kennecott Mine in Alaska" ([January](#))

**Tenth place, Original poetry, adult:** Linda Benedict, "Gemming at Leisure" ([October](#))

Congratulations to all our authors! Thanks to your contributions, we can all continue to feel proud—not because of the awards, but because you make our newsletter so good! ➤



## Book Review Early Native Americans Collected Fossils

by Jennifer Haley, AFMS Historian

**Editor's note:** The article is adapted from AFMS Newsletter (April/May 2019), p. 14.

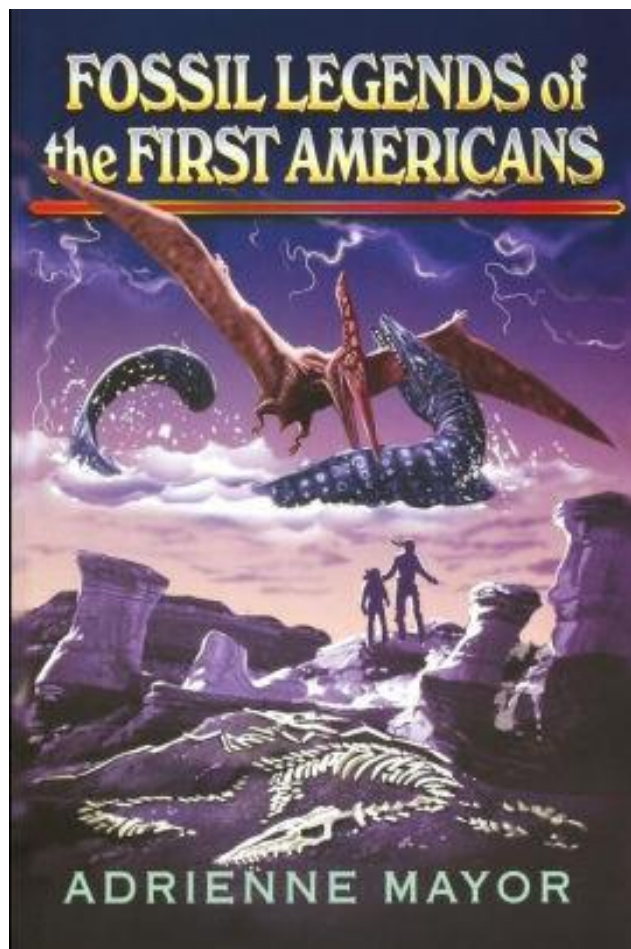
**H**ave you ever wondered whether American Indians, before European settlement, not only found but also treasured fossilized dinosaur bones?

I was curious and looked for information about that subject to add to what we know about early paleontology. I found a gem of a thick book called *Fossil Legends of the First Americans*, by Adrienne Mayor. The information in the book is sourced from paleontologists, archeologists, artifacts, pictographs, and oral histories. The book includes some photographs.

There is evidence that early Native Americans were familiar with large dinosaur fossil tracks. Often, smaller fossils such as mammoth teeth and other types of bones were used in medicine pouches, and a range of fossils was used by medicine men and medicine women (spiritual leaders and healers).

There were great stories and myths about the creatures associated with the larger fossils, which became legends, full of rich imagination and surprisingly close in some instances to what paleontologists now know about some of the “giant lizards” that long ago roamed our Earth. There is wonderful information in the book to share around the campfire and for articles in your newsletter. Juniors have great imaginations and would love to hear about this fascinating period in paleontology.

*Fossil Legends of the First Americans*, by Adrienne Mayor, would be a great addition to your bookshelf. ↗



I often expound on matters of safety. The subject of hearing in particular is near and dear to me because I enjoy listening to the world around me ... and my hearing makes listening possible. A friend with partial hearing loss recently wondered, “Why should I bother with hearing protection?” Recognizing an opportunity to speak about one of my favorite subjects, I responded with glee.

Hearing loss generally progresses slowly over time. You can easily reduce the degree of additional loss by reducing the amount of extraneous or excessive sound entering your ears. You can protect what hearing you have by wearing some type of muffling device—ear plugs, ear valves, ear muffs, and so on.

At any point in the hearing-loss process, you can start using hearing protection and, by that simple action, protect what hearing you have left. Keeping what remains of your hearing can be as simple as wearing protection—and, yes, I am repeating myself—refer back to the title of this article.

## Safety Matters Once Is Not Enough

by Ellery Borow, EFMLS Safety Chair

**Editor's note:** The article is adapted from EFMLS Newsletter (February 2013), p. 3.

**O**nce is not enough when it comes to safety. Most safety messages need repeating before they stick.



Folks have sometimes mentioned that wearing ear protection is uncomfortable. One of the keys to remedying uncomfortable or ineffective protective equipment is making sure to use the right size of equipment. Ear plugs, for instance, come in different sizes for different-size ear canals. Some plugs come on short strings to drape around the neck when not being used. Some plugs come fitted on a headband to secure the ear plugs in place. Most ear plugs are more effective if they are properly inserted in the ears. By all means, please read and follow the directions that come with your hearing protection equipment in order to get the most protection value from the money spent.

Eyeglass wearers often have problems wearing ear-muff-type hearing protectors. The eyeglass temple pieces often prevent a good sound seal of the muff to the ear. There are, however, muffs designed for eyeglass wearers. For ear protection to be most effective and comfortable, you have to wear the proper kind of protection. When in doubt about a decibel reduction rating for your hearing protectors or proper usage, please read the instructions.

I'm not sure the message I offered to my friend about hearing loss sank in. But I am going to keep offering it. I really don't want sound advice falling on deaf ears. If I may respectfully suggest it, please reread that last line—it's a good one. ↗

## Field Trip Opportunities

### Northern Virginia Community College Geology Field Trips

NOVA's Annandale campus offers 1-day weekend courses—essentially, field trips—related to our hobby. You can get more information on each of the field trips listed below at the [Field Studies in Geology—GOL 135 website](#).



#### Miocene Geology of Calvert Cliffs, MD

**September 21, 9 a.m.–6 p.m.** Learn how the Miocene seas spread across the Chesapeake Bay region about 10 to 20 million years ago. We will visit the Calvert Marine Museum collections and study ancient sediments, stratigraphy, and paleoenvironments preserved in world-famous Calvert Cliffs, MD, collecting fossils along the way.

### Building Stones of the National Mall

**October 12, 9 a.m.–6:30 p.m.** Visit 20 different sites on the National Mall, examining geologic history and architecture and the rocks used to construct buildings and monuments.

### Geology of Holmes Run Gorge

**November 9, 9 a.m.–5 p.m.** Holmes Run Gorge is a canyonlike area less than 2 miles from NOVA in Alexandria. Our instructional day will consist of a 4-hour class at the college, followed by a 4-hour geologic tour of the gorge. Then you will have 10 days to complete a set of related online assignments.



### Audubon Naturalist Society

The ANS offers classes and nature programs, including short field trips. You can get more information and register at the [ANS website](#).

### Geology of Sugarloaf Mountain, MD

**September 15, 9 a.m.–noon.** The cost of this field trip, led by Joe Marx, is \$36 for nonmembers. Sugarloaf Mountain, in southern Frederick County, has long been an enigma to geologists. To study the mountain's origin, we'll drive to two overlooks and then hike to the summit and back on a 1-mile loop. We'll ascend using the steep stone steps of the Green trail and then descend, more gently, on the Red and Blue natural surface trails. Our geology hikes typically move at a faster pace than our normal naturalists' shuffle.

### Geology of Soapstone Valley, DC

**October 26, 1–4 p.m.** The cost of this field trip, led by Joe Marx, is \$36 for nonmembers. Soapstone Valley, in the Van Ness section of the District of Columbia, provides a pleasant hike through deep woods. Extending about a mile from Connecticut Avenue to Broad Branch, the valley cuts across no less than four geological formations, all related to the Taconic Orogeny. We will walk about 2 miles. The trail is wide and relatively easy, but there are seven crossings of the little stream, none with bridges. Ups and downs are gentle, but the trail drops several hundred vertical feet on its way to Broad Branch and, of course, the altitude must be regained on the return. The pace set is faster than our usual "naturalist's shuffle." ↗



## Smithsonian Fossil Hall Impressive New Exhibits

by Hutch Brown

**I** grew up in this area, so I can remember visiting the Smithsonian many times, usually whenever relatives came to town. I remember the things a kid would—airplanes hanging from wires ... the huge African elephant ... and, of course, the dinosaur bones reconstructed as Tyrannosaurus rex, Stegosaurus, and such.

When I moved back to this area in 1992, I revisited the Fossil Hall in the National Museum of Natural History. I was impressed by the story of evolution told by the displays, punctuated by the mass extinction events. The story seemed easy to follow, and if I wanted to focus on dinosaur fossils ... well, they were there too.

In 2014, the Smithsonian started a 5-year overhaul of the Fossil Hall, reopened to the public in June 2019. Sue Marcus, our club president, has long volunteered at the Smithsonian and got tickets to a preview of the new Fossil Hall. Generously, she invited me along, together with Roger Haskins, our treasurer (and Sue's husband), and Barry Remer, former club president.

So on the evening of June 1, along with scores of other visitors, the four of us took the opportunity to spend 2 hours wandering the newly reopened hall and admiring the displays. It was a wonderful opportunity, and I thank Sue for her generosity!

It told a story with a timeline. *(cont. p. 19, left)*

## Smithsonian Fossil Hall New Exhibits, New Layout

by Sue Marcus

**T**he newly reopened Smithsonian Fossil Hall comprises a single huge room with a line of exhibits down the center. Exhibits also line the walls and the backs of the central corridor displays. You can view the central exhibits or the exhibits around the edges, but there is no clear path to follow.

The main hall has short films along the way, some with viewing areas and seating. The videos offer more detailed information about certain subjects. Throughout the exhibits, touchable objects add to the fun.

Two side rooms opening onto the main hall contain more exhibits—and more pathway options, making for more complexity. One room is the Coralyn W. Whitney Fossil Basecamp; it has hands-on activities, primarily for kids, although adults can learn too.

Normally, visitors enter and exit the hall via the rotunda or the African Voices exhibit. During busy times, visitors enter through the African Voices exhibit and exit into the rotunda.

Many displayed specimens are not originals but rather molds, casts, or other replicas. (In some cases, the original materials are too fragile to be displayed.) In displays of mixed specimens, such as of dinosaurs and other large beasts, it would be informative to know what is original and what is not. *(cont. p. 19, right)*



NVMC members attending a preview of the new Smithsonian fossil hall on June 1, a week before the grand opening to the general public. From left to right: Barry Remer, Hutch Brown, Roger Haskins, and Sue Marcus. Photo: Mary Jo Alfano.

*(“Impressive New Exhibits,” from p. 18)*

As you enter the hall, you are invited to explore “deep time”—the entire 3.7-billion-year history of life on Earth—connecting it back to our present and future as a species.

It was an invitation to follow a storyline with a past, present, and future. And that’s great—story telling is how people learn best. For tens of thousands of years, people conveyed their history, culture, and wisdom by telling stories around campfires.

As you enter from the rotunda, you follow panels and fossil displays, both on the walls and on the hall floor. The displays are organized by time period, with the first period beginning about 2 million years ago and ending with the asteroid that destroyed the dinosaurs.

Yet it’s easy to get lost. (Sue Marcus explains why in the companion piece.) The first thing I saw was a display of mammalian fossils, and its connection to the Tertiary Period was not entirely clear to me. Maybe it was the crush of people hiding the information.

Similarly, a prominent floor display near the front of the hall includes the obligatory T. rex, which is indeed impressive. But its context within the evolutionary timeline of life was not entirely clear either. It seemed to be a self-contained “cool” display.

You gradually move back in time, with fossils from various periods, along with videos on various topics. At the end of the hall, you reach “deep time”—displays about how life began from a single cell about 3.7 billion years ago. By entering the hall from that side, you follow the story in reverse. *(cont. p. 20, left)*



*Tyrannosaurus rex in lifelike action. Photo: Sue Marcus.*

*(“New Exhibits, New Layout,” from p. 18)*

I also found it difficult to track some specimens to their associated labels.

Such trifling complaints won’t matter to most visitors. But to those who really want to learn what the *specimens* (not just the words) are teaching us, the much anticipated new Fossil Hall could have been more informative.

And it definitely could have presented a story easier to follow.

For a *ScienceNews* review of the new Fossil Hall, click [here](#). ➤



*Hands-on displays offer opportunities for wonder and learning. Photo: Sue Marcus.*





A wall display of fossil fish showing a number for each specimen correlating to a label with the scientific name but not the locality or the age, an instance of inadequate information (though perhaps untroubling to most visitors). Photo: Sue Marcus.

### ***(“Impressive New Exhibits,” from p. 19)***

After finding your way back to the beginnings of “deep time,” you come back down the other side of the hall, which explains the impact of *Homo sapiens* on life. The jump is abrupt, and it can be confusing.

Along the way are minidisplays on the floor that show changes in the global configuration of the continents over hundreds of millions of years, together with the associated changes in landscapes and lifeforms. That was actually my favorite part!

If the focus of your interest is geology (as it is for me), then you might wish that the museum had better connected the fossils to plate tectonics, including the eruptions that contributed to some of the mass extinctions. I would think that the science and capacity are there.

One point repeatedly made is the major impact of atmospheric carbon—and the negligible role of glaciation—over billions of years of Earth history. Our current era of ice-covered poles and relatively low atmospheric carbon is highly unusual for our planet.

But so is the current rate of carbon emissions *and* the rate of species extinctions (except in the extremely rare

event of a mass extinction—in 3.7 billion years, there have been only five major ones).

The displays toward the end of the circuit showing the impact of *Homo sapiens* make clear that human activity is responsible for both global warming and the rate of species extinctions, with ominous implications for the future of life on Earth. It is a point made in graphic detail again and again, well worth seeing and understanding in and of itself.

If you haven’t yet been, I urge you to visit! ➤

### **GeoWord of the Day**

*(from the American Geoscience Institute)*

#### **ice-rafting**

The transporting of rock fragments of all sizes on or within icebergs, ice floes, or other forms of floating ice. Cf: rafting; dropstone.

(from the [Glossary of Geology, 5th edition, revised](#))



## AUCTION BID SLIP

ITEM # \_\_\_\_\_

DESCRIPTION \_\_\_\_\_

FROM \_\_\_\_\_

Starting bid amount: \_\_\_\_\_

*Bidders: You need to bid on this item if you  
want it to be auctioned! Place bid below.*

NAME/BID

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## AUCTION BID SLIP

ITEM # \_\_\_\_\_

DESCRIPTION \_\_\_\_\_

FROM \_\_\_\_\_

Starting bid amount: \_\_\_\_\_

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NAME/BID

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FROM \_\_\_\_\_

Starting bid amount: \_\_\_\_\_

*Bidders: You need to bid on this item if you  
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NAME/BID

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## AUCTION BID SLIP

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DESCRIPTION \_\_\_\_\_

FROM \_\_\_\_\_

Starting bid amount: \_\_\_\_\_

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want it to be auctioned! Place bid below.*

NAME/BID

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## AUCTION BID SLIP

ITEM # \_\_\_\_\_

DESCRIPTION \_\_\_\_\_

FROM \_\_\_\_\_

Starting bid amount: \_\_\_\_\_

*Bidders: You need to bid on this item if you  
want it to be auctioned! Place bid below.*

NAME/BID

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SUMMARY SHEET FOR AUCTION ITEMS SUBMITTED BY \_\_\_\_\_

Initials	Item #	Description	Minimum bid	Final sale price
	1			
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	3			
	4			
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	8			
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	10			
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	27			
	28			

## September 2019—Upcoming Events in Our Area/Region (see details below)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2 <b>Labor Day</b>	3	4 MSDC mtg, Washington, DC	5	6	7
8	9 GLMSMC mtg, Rock- ville, MD	10	11	12	13	14 Show: Mays Landing, NJ
15 Show: Mays Landing, NJ <b>ANS field trip</b>	16	17	18	19	20 Show: Fish- ersville, VA	21 <b>NOVA field trip</b> Show: Fish- ersville, VA
22 Show: Fish- ersville, VA	23 <b>NVMC mtg, Arlington, VA</b> <b>Fall begins</b>	24	25 MNCA mtg, Arlington, VA	26	27	28
29	30					

### Event Details

**4: Washington, DC**—Monthly meeting; Mineralogical Society of the District of Columbia; 7:45–10; Smithsonian Natural History Museum, Constitution Avenue lobby.

**9: Rockville, MD**—Monthly meeting; Gem, Lapidary, and Mineral Society of Montgomery County; 7:30–10; Rockville Senior Ctr, 1150 Carnation Dr.

**15: Geology of Sugarloaf Mountain, MD**—Geology field trip; 9–12; ANS; info, reg: [ANS website](#).

**15–16: Mays Landing, NJ**—2019 Fall Show; Cape Atlantic Rock Hounds; 2653 Cologne Ave; Sat/Sun 9–5; free parking/admission; info: [www.CapeAtlanticRockHounds.com](http://www.CapeAtlanticRockHounds.com).

**20–22: Fishersville, VA**—52nd annual show; Shenandoah Valley Gem & Mineral Society; Augusta EXPO; Fri 2–6, Sat 10–6, Sun 11–5; info: <http://tinyurl.com/SVGMS-show-2019>.

**21: Miocene geology of Calvert Cliffs, MD**—Geology field trip; 9–6; NOVA; info, reg: [GOL 135 website](#).

**23: Arlington, VA**—Monthly meeting; Northern Virginia Mineral Club; 7:30–10; Long Branch Nature Center, 625 S Carlin Springs Rd.

**25: Arlington, VA**—Monthly meeting; Micro-mineralogists of the National Capital Area; 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.



Hutch Brown, Editor  
4814 N. 3rd Street  
Arlington, VA 22203



**Mineral of  
the Month:  
Galena**

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PLEASE VISIT OUR WEBSITE AT:  
<http://www.novamineralclub>

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## 2019 Club Officers

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## The Northern Virginia Mineral Club

**Visitors are always welcome at our club meetings!**

Please send your newsletter articles to:  
[hutchbrown41@gmail.com](mailto:hutchbrown41@gmail.com)

### **RENEW YOUR MEMBERSHIP!**

#### **SEND YOUR DUES TO:**

Roger Haskins, Treasurer, NVMC  
4411 Marsala Glen Way, Fairfax, VA 22033-3136

**OR**

Bring your dues to the next meeting.

**Dues:** Due by January 1 of each year;  
\$20 individual, \$25 family, \$6 junior (under 16, sponsored by an adult member).

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**Purpose:** To encourage interest in and learning about geology, mineralogy, lapidary arts, and related sciences. The club is a member of the Eastern Federation of Mineralogical and Lapidary Societies (EFMLS—at <http://www.amfed.org/efmls>) and the American Federation of Mineralogical Societies (AFMS—at <http://www.amfed.org>).

**Meetings:** At 7:45 p.m. on the fourth Monday of each month (except May and December)\* at **Long Branch Nature Center**, 625 Carlin Springs Road, Arlington, VA. (No meeting in July or August.)

*\*Changes are announced in the newsletter; we follow the snow schedule of Arlington County schools.*

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