



The Mineral Newsletter

Meeting: October 23 Time: 7:45 p.m.

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



Scheelite

from China

[Smithsonian National Mineral Gallery](#)

Photo: Penland.

Volume 58, No. 8

October 2017

Explore our [Website!](#)

October Meeting Program:

Fossil Insects From the Eocene

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Deadline for Submissions

October 20

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



Mineral of the Month Scheelite

by Sue Marcus

Scheelite is a major ore of tungsten. It is found around the world, forming attractive crystals from many localities.

Baron Axel Fredrik Cronstedt, one of the first people to study the science of minerals, was an eminent Swedish mineralogist and chemist. In 1751, he discovered the original material of scheelite in the copper mines of Bispbergs Klack, Säter, Dalarna, Sweden. He called it *tung sten* (tungsten in English), using the Swedish term for heavy stone.

In 1781, Karl Wilhelm Scheele, a Swedish chemist, realized that a metal could be extracted from this mineral. The mineral name became scheelite (for Scheele) with “tungsten” reserved for the metal.

Scheelite fluoresces light blue or blue-white in short-wave ultraviolet light, most commonly as blebs in the country rock. The less common lovely crystals of scheelite will also show this identifying trait.

Although it is not phosphorescent, scheelite is thermoluminescent. Mineral collectors and geologists who explore for economic mineral deposits use scheelite's fluorescence to locate it.

Parts of California and Nevada that attract these seekers hold a surprise. Scorpions fluoresce in a bluish color quite similar to that of scheelite. They live under rocks—think of collectors turning over rocks to seek scheelite. Well, if it moves, it is *not* scheelite! And if it stings, it is *definitely* not scheelite!

Exploration geologists can search for scheelite as a mineral associated with gold in some geologic environments. It can be found in skarn deposits, which occur when hot mineralized fluids pervade, leach, and replace the carbonate-rich country rock. It also occurs in pegmatites and vein deposits.

Scheelite is mined for tungsten. Most tungsten ore is processed into tungsten carbide, used for cutting tools and abrasives. China is the world's largest tungsten producer.

The United States has one primary scheelite producer near Wendover, UT. Scheelite Metals LLC opened the Fraction Mine in Gold Hill, UT, in about 2013.

Happy Halloween!



Northern Virginia Mineral Club members,

Please join guest speaker Dale Greenwalt for dinner at the Olive Garden on October 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.



Scheelite crystals on muscovite from Mt. Xuebaoding, Pingwu County, Mianyang Prefecture, Sichuan Province, China. Source: Wikipedia; photo: Rob Lavinsky.

Sadly, I could find no indication of any crystalized specimens.

Beautiful orange scheelite crystals with perfect muscovite crystals from Sichuan, China, have been on the market for the past few years. Shardu and Gilgit, Pakistan, are other recent sources of fine crystals. Crystals from these localities are usually pseudo-octohedral or dipyramidal, even though the structure adheres to the tetragonal crystal system.

In the United States, the Camp Bird Mine, near Ouray, CO, was a source of lustrous golden to brown crystals in the 1970s and 1980s. Scheelite was mined in Kern County, CA, and crystalized specimens were recovered there.

Scheelite can be faceted into gems of great beauty and sparkle. But the gems are very fragile because they are brittle and the mineral is relatively soft. The largest known cut stone is a 58-carat hunk from Namibia.

Technical details (source mostly Mindat):

Chemical formula	Ca(WO ₄)
Crystal form.....	Tetragonal
Hardness	4.5 to 5
Density.....	6.1(2) g/cm ³ (measured); 6.09 g/cm ³ (calculated)
Color	Dark brown to black, orange; less commonly tan-yellow, green, white
Streak.....	White
Cleavage	One good cleavage, one fair parting
Fracture.....	Irregular
Luster.....	Resinous to adamantine

Sources

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Dale Greenwalt

Fossil Insects From the Eocene of Montana October 23 Program

The Middle Fork of Montana's Flathead River forms the southwestern boundary of Glacier National Park,

CLUB OFFICER ELECTIONS COMING UP!

It's that time of year again!

At the December club meeting, we will elect club officers for 2018. We need candidates for president, vice-president, secretary, and treasurer.

As chair of the nominating committee, I am asking club members to step forward to help. We need both long-term club members and newer members in officer positions for the leadership we will need in the future. Former club officers are willing to mentor new officers as needed.

Self-nominations are welcome, as are nominations by friends! So please step up, folks!

Send your nomination(s) to me at parkeramandalynn@gmail.com.

Amanda Parker
Chair, Nominating Committee

a favorite destination for trout fishermen from all over the United States. However, few know that the river has eroded a passage through the valley between the park and the Great Bear Wilderness Area, exposing shale derived from sediments of an ancient lakebed. Known to geologists as Lake Kishenehn, the lake existed 46 million years ago.

Over the last 7 summers, scientists from the Paleobiology Department of the Smithsonian National Museum of Natural History have collected over 7,000 pieces of this shale. The ancient sediments contain what are arguably some of the most exceptional insect fossils in the world. The fossils are beautifully preserved, and many contain preserved original biomolecular components.



A well-preserved wasp from the family Diapriidae, found along Montana's Flathead River.

Dale Greenwalt, our presenter, will describe the specimens and discuss the evolution of specific insects. Dale has 10 years of experience in the curation of fossil insect collections at the Smithsonian National Museum of Natural History. With the administrative support of Conrad Labandeira, he initiated the Kishenehn Formation fossil insect collection project and has been responsible for all fieldwork and curation of the collection and for interactions with and reports to the U.S. Forest Service (which manages the Flathead National Forest).

Dale has a Ph.D. in Comparative Biochemistry from the University of Iowa. He retired from Cambrex Bio Science Walkersville, Inc., after serving as its technical director of assay development from 1999 to 2006. He joined the Paleobiology Department at the Smithsonian as a volunteer in 2007 and has been there ever since. Since May 2014, Dale has also been president of and program director for the Paleontological Society of Washington. ♪



The Prez Sez

by Bob Cooke

Last month's auction was quite the event. I hope everyone found something nice to tempt them. Two thumb-nail-sized minerals managed to go home with me. I'm happy. Well, the real reason I'm happy is because of all

your efforts to buy the lapidary rough that no longer has to be stored in my garage.

It's now time to get focused on the November mineral show. It's amazing to realize all the work that Show Chair Tom Taaffe has been doing to find vendors, get contracts signed, establish a floor plan for the new locale, get the handout cards printed, prepare other postcards for a mass mailing to previous attendees, and coordinate myriad details with Professor Julia Nord at George Mason University.

Meantime, Professor Nord is organizing all the Scouting activities. What an effort that is!

We still need to finesse the unloading/loading issues that will be unique to Dewberry Hall: its loading dock is designed for 18-wheelers, not for vans and panel trucks. All in all, however, I think the new venue will allow us to have a much better mineral show, if only we can survive the growing pains.

In December, we will vote for new club officers, but first we need a slate of candidates. When I asked at the last meeting for someone to head the Nominating Committee, the response was rather underwhelming. I must express my thanks to Amanda Parker for being so gracious as to allow herself to be coerced into taking the position.

If you are approached about being a club officer next year, please give it some serious consideration! We need new people with new ideas.

At the October meeting, I'll have to ask for another volunteer. This time it'll be to organize the Holiday Party on December 18. Last year, I tricked Sue Marcus into accepting the duty. If I try that again this year, I'm afraid she won't speak to me again (because I'll be dead). Remember: no volunteer, no party. ♪

Bob

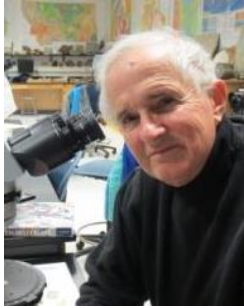
New Club Meeting Dates!

November/December

In coming months, the NVMC will *not* meet as usual on the fourth Monday. Instead, we will meet on:

November 13—to precede the annual club show on November 18–19; and

December 18—for the Holiday Party (the fourth Monday is Christmas).



Meeting Minutes September 25, 2017

by David MacLean, Secretary

President Bob Cooke called the meeting to order at about 7:45 p.m. at the Long Branch Nature Center in Arlington, VA.

The minutes from the June 25 meeting were approved as published in *The Mineral Newsletter*.

There was no treasurer's report.

Bob recognized past Presidents Sue Marcus, Rick Reiber, and Barry Remer.

Old Business

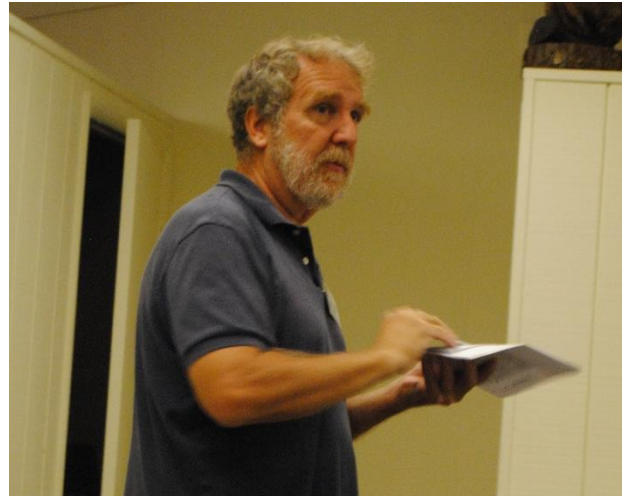
The president showed the design of the new NVMC nametag. The design shows an outline of Virginia with a star at the location of Arlington and a group of five quartz crystals, the central crystal larger than the others. The expected price per nametag is \$10.

New Business

The annual NVMC show in 2017 will be on Saturday, November 18, and Sunday, November 19, at the Johnson Center in GMU's Dewberry Hall. The location is different from previous years.



Specimens laid out for viewing and silent bidding in preparation for the club's Fall Auction.



Show Chair Tom Taaffe announcing plans for the annual club show on November 18–19, 2017.

The main room has enough space for the dealers, the four NVMC exhibit cases, the kids' table, the micro-mineral viewing table, and other activities. Electrical outlets are on the floor, obviating the need to run electrical cords across the floor from the walls to the dealers.

Setup is late afternoon on Friday, November 17. The loading dock is designed for trucks; therefore, all items must be lifted onto the chest-high loading dock. A hydraulic lifter will be needed. Dealers will need help in bringing their wares into Dewberry Hall.

Show Chair Tom Taaffe distributed printed show flyers and cards for members to distribute.

Awards

Newsletter Editor Hutch Brown described the AFMS and EFMLS bulletin editors' contest. The EFMLS awards for 2017 have not been made public.

The Mineral Newsletter received a fourth-place award from AFMS. Thank you, Hutch!

Mike Kaas received an eighth-place award from AFMS for his article "Getting the Big [Geologic] Picture."

Announcements

On September 16, 60 to 80 people went to the Willis Mountain Kyanite Mine, where they found iridescent hematite and some blue kyanite.

The nominating committee for club officers in 2018 must present a list of candidates at the club meeting.



Vice-President Ti Meredith (left) served as auction runner. Sue Marcus and Matt Charsky were the auctioneers.



Auction items included flats.

The auction netted \$336 for the Fred Schaefermeyer Scholarship Fund.

on November 13. The election will be held at the December 18 meeting before the Holiday Party.

In order to avoid the week of Thanksgiving, the November NVMC meeting will be on Monday, November 13. The December meeting and Holiday Party will be on December 18.

Fall Auction

The program for the meeting was the Fall Auction. The most noteworthy item offered was a large lampshade made of oval agate slabs. The lampshade hangs by a chain attached to its top. The minimum bid was \$50. ↗

Bench Tip Drill Breakage

Brad Smith

Using a small drill is difficult for a beginner, especially if it is hand held in a flexshaft or Dremel. Small drills are easily broken if you push too hard or if you tilt the drill while it's in the hole.

Most problems, however, are the result of buying cheap drills that suffer from poor-quality steel or inaccurately ground cutting edges. A good drill from a jewelry supply company is well worth the price.

Remember that drilling always goes easier with lubrication. A little wax or oil is all you need. Almost anything will work—Three and One, beeswax, mineral oil, injection wax, car oil, olive oil, or one of the commercial cutting waxes. The lubricant helps to move chips out of the hole and reduces friction of the drill against the side of the hole, keeping the drill cooler.

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

Editor's Corner Club Officers

by Hutch Brown, Editor

As editor of our newsletter, I am not a club officer. There are only four club officers: president, vice-president, secretary, and treasurer. They are at the top of the list of "Club Officers and Others" on the last page of this issue.

Those of us on the list who are "others" also contribute to our club, but we generally do so for fun. Editing our club newsletter is fun for me; I find it relaxing. And our webmaster, show chair, and others probably have reasons for volunteering based on what they personally like to do.

That might be less true for our four club officers. No doubt gratification comes with the office, but our president and vice-president do a tremendous amount to keep our club going. So does our secretary in taking notes at club meetings and writing them up, along with summarizing the club meeting programs; so does our treasurer in collecting and disbursing funds and managing club budgets. Plus all the meetings our club officers attend!

So shouldn't those jobs get spread around?

And yet, if you look below at the list of club officers over the last 10 years, how many names do you see?

I count 12 names in all, with most appearing multiple times. Rick Reiber is the winner, with Kathy Hrechka close behind. Their names alone appear 18 times on a list with 40 slots.

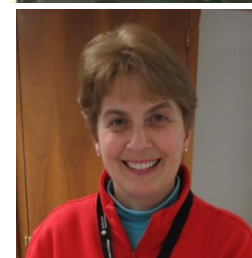
Thanks, Rick and Kathy! And thanks to all our other club officers for dedicating so much of their valuable time!

But a club like ours cannot keep operating like this. We can't simply sit back and trust that the same handful or two of people will keep performing the same crucial tasks year after year, making the club tick. Not without risking total burn-out. And it simply isn't fair!

We have dozens of dues-paying members. I'm betting that many of us could step into those well-worn shoes, at least for a year or two. And new club officers can always count on help from those who have worn those shoes before.

So now that it's time to nominate club officers for 2018, please consider doing your part: help carry the load. Send your nomination (or self-nomination) to [Amanda Parker](#), chair of the Nominating Committee.

And get ready to add your name to the NVMC Hall of Fame! ↗.



Rick Reiber and
Kathy Hrechka.

NVMC Hall of Fame: Club Officers, 2008–2017

Year	President	Vice-President	Secretary	Treasurer
2017	Bob Cooke	Ti Meredith	David MacLean	Rick Reiber
2016	Bob Cooke	Ti Meredith	David MacLean	Rick Reiber
2015	Wayne Sukow	Kathy Hrechka	David MacLean	Rick Reiber
2014	Wayne Sukow	Kathy Hrechka	Ti Meredith/ Laurie Steiger	Kenny Loveless/ Rick Reiber
2013	Rick Reiber	Kathy Hrechka	David MacLean	Kenny Loveless
2012	Sue Marcus	Barry Remer	Kathy Hrechka	Rick Reiber
2011	Barry Remer	Sue Marcus	Kathy Hrechka	Rick Reiber
2010	Barry Remer	Sue Marcus	Kathy Hrechka	Rick Reiber
2009	Wayne Sukow	Barry Remer	Kathy Hrechka	Rick Reiber
2008	Wayne Sukow	Jenn Hammond	Kathy Hrechka	Rick Reiber



26th Annual Show Coming Up! November 18–19, 2017

by Tom Taaffe, Show Chair

The NVMC holds its 26th Annual Gem, Mineral, and Fossil Show on November 18 and 19 at George Mason University.

The big change this year is that our show is moving two buildings over to the Johnson Center. The show site will be Dewberry Hall inside the Johnson Center.

New GMU Location!!

Dewberry Hall is a wonderful facility that will hold all our show offerings, with everything in one large room. That includes our dealer booths, the kids' activity area, and our exhibits, demonstrations, and silent auction. This is our first time in this room, and we have a new floor plan. But we will be figuring some things out as we go forward.

Setup is on Friday evening, November 17, starting at about 5 p.m.

SHOW VOLUNTEERS NEEDED !!

We will need a host of club volunteers over the course of both show days and for setup on Friday. We have a number of tasks to perform and positions to fill. We encourage volunteers to sign up for shifts of at least 2 hours—more, if you can manage it.

We are very grateful to all the volunteers who so generously helped out at past shows, and we hope that many of you will return to help us again at the 2017 show. We need volunteers for the tasks and activities summarized below.

If you can volunteer or have any questions, please contact Tom Taaffe at rockellctr@gmail.com or call me at 703-281-3767; you can also text me at 571-345-5310. Or you can volunteer by contacting President Bob Cooke at rdotcooke@gmail.com.

Annual Gem, Mineral, and Fossil Show Participating Dealers

Alan's Quality Minerals, NJ
Arrowwood Minerals, Dick Ertel, VA
John Culberson, TX
Jonathan Ertman, Rockville, MD
Bob Farrar, Bowie, MD
The Garnet Group, Casper Voogt, VA
Geosol Imports, Rob Evans, Dillsburg, PA
Greg Graupp, Lebanon, PA (cabochons)
Hartstein Fossils, Gene Hartstein, DE
Dave Hennessey, Woodbridge, VA
Jan Minerals, Jehan Sher, Lorton, VA
George Loud, Hilton Head, SC
KBT Minerals & Fossils, Tom Taaffe, Vienna, VA
The Mineral House, Tom & Pam Kottyan, Bucyrus, OH
The Prospector Shop, Marianne Cannon, Acme, PA
Barry Remer, Reston, VA
Don Soechting, Charlottesville, VA (agates)
Williams Minerals, Keith Williams, Rio, WV
Yinan Wang, Arlington, VA

Friday Night Setup (A): Volunteers bring materials from the club's storage unit to the Johnson Center, arriving at about 5 p.m. Materials include exhibit cases, heavy-duty electrical cords, table coverings, miscellaneous supplies, and mineral specimens for the auction and for the Kids' Mini-mines, plus materials for the kids' activity room. If we have not already done so, we will also need to bring all the campus directional signs. This task typically requires two to three vehicles and their drivers, depending on the size of the vehicles. The club storage unit is conveniently located a few miles from GMU.

Friday Night Setup (B)—Loading Dock Procedures: The Johnson Center has an elevated loading dock with three bays. **Note:** The Johnson Center *does not* have a parking lot, so loading in and out will be quite different from the Hub. We hope to gain permission to use nearby parking lot A on Friday night;

otherwise, volunteers will need to park in the closest GMU parking garage.

We will have a system worked out. Club volunteers as well as student volunteers will be needed to first help unload all club materials (which we hope to have finished by 6 p.m.).

Starting at 6 p.m., we will need volunteers to help incoming dealers unload their goods at the three bays on the loading dock and help guide and transport the goods into Dewberry Hall. Dealers will have assigned times (staggered) to prevent a logjam. Some of the dealers will be scheduled to load in on Friday night and some will be scheduled for Saturday morning.

Friday Night Setup (C): Starting at about 5 p.m. at Dewberry Hall in the Johnson Center, volunteers will help arrange and adjust tables for the dealers first, then for exhibits. Then they will assemble the exhibit cases.

Volunteers will also set up the kids' activity area, arranging the quizzes, Kids' Mini-mines, and work-stations. Other setup tasks will include distributing and securing heavy-duty electrical cords for each booth section in the ballroom and helping to make sure that the table floor plan is accurate.

Admission Desk: Volunteers greet show attendees, collect admission, and issue door prize tickets. You can sign up for slots on Saturday from 10 a.m. to 5:30 p.m. and Sunday from 10 a.m. to 3:30 p.m.

Kids' Activities: Volunteers administer mineral- and fossil-related quizzes, manage the Kids' Mini-mines, and do what they can to help kid learn. Hours are Saturday from 10 a.m. to 6 p.m. and Sunday from 10 a.m. to 4 p.m. Peak times, when help is needed most, are Saturday from 11 a.m. to 5 p.m. and Sunday from 12 p.m. to 3 p.m.

Silent Auction: Volunteers organize donated specimens, create bid slips, monitor 1 hour of the actual auction, collect winning bids, and distribute specimens. Hours are Sunday from 1 to 2 p.m. We usually need three to four volunteers.

Floater: Club volunteers attend the show and help as the need arises. Often, the kids' activity tables or admission tables get overwhelmed, and our floaters step in to help out during the rush. When things calm down, they go back to enjoying the mineral show.

Door Prize Announcer-Manager: A club volunteer pulls hourly winning door prize tickets for kids as well as for adults, announces the winners, escorts winners to the door prize table, and supervises prize selection.

Floater/Security: Volunteers attend the show and rotate from room to room to make sure everything is running smoothly and that exhibits, activities, and demonstrations are not being overrun and volunteers are not overstressed. We ask for up to 4-hour shifts (half a day) for these trouble-shooting positions. For example, you might work on Saturday from 10 a.m. to 2 p.m. or from 2 p.m. to 6 p.m., but we will happily accept whatever a volunteer can do.

Sunday Takedown: This is the reverse of the Friday night setup, starting at 4 p.m. at the show's close on Sunday. Volunteers carefully take apart exhibit cases and packing them away, gathering up all club materials: the Kids' Mini-mines and kids' specimens, the heavy-duty electrical cords, and everything else. Volunteers deliver these items to the club's storage unit and put them away. Additionally, we need someone with a vehicle to gather all the campus directional and shuttle signs and make them ready for returning to the club's storage unit. Sunday night takedown goes pretty fast if numerous people help and volunteer their vehicles for the return trip to the storage unit. You don't need a vehicle to help out, but a few (perhaps three) people with vehicles will be needed.



Display at the annual club show in November 2015.

Photo: Sheryl Sims.

Mineral Show Parking: We anticipate that designated parking will be in parking lot A, just as it was in 2016. It will be a short and easy walk to the Johnson Center. We anticipate that our shuttle route stop and pattern will change a little to fit our new venue. Our GMU sponsor (the Department of Atmospheric, Oceanic and Earth Sciences) will have directional signs placed around campus to point the way to show parking and the shuttle stops. ↗

Mispelling

by Jack Busch

Editor's note: The article, timed here for our own club show, is adapted from Livermore Lithogram (newsletter of the Livermore Valley Lithophiles, Livermore, CA), January 2011, p. 5; it originally appeared in The Rockhouser (newsletter of the Gem, Lapidary and Mineral Society of Montgomery County, Maryland, Inc.), December 2010.

Did you notice anything wrong with that title? Of course you did, it was misspelled. Looks awful, too, doesn't it?

Well, misspelled labels also look awful. Our next club show soon will be here, and many folks already are preparing their exhibits. True, we no longer judge them by AFMS Uniform Rules, under which points were deleted for labeling errors. Yet it does take something away from an excellent exhibit when names are misspelled.

One of the most common misspellings appears on labels for CaF_2 . That's right, fluorite. Recently, I acquired two nice specimens of that mineral bearing tags that read "Florite." Phonetically it might be right, but not mineralogically.

The most frequent misspelling is "Flourite," and not just ordinary rockhounds make that error. Years ago, one of our leading magazines contained an excellent and erudite article about fluorite, and in the article the name was spelled correctly. However, the captions under the seven photographs that accompanied the article all read "Flourite." All seven of them!

So it's not just amateurs that goof; professionals can do it, too.

The gemstone aventurine (quartz with spangle inclusions of hematite, mica, or other minerals) frequently also is misspelled. Although it may be an adventure



This Roman cup (50–100 AD) could hold flour, but it is made of fluorite, not "flourite" (a common misspelling). Source: Wikipedia.

to find a good specimen and turn it into a piece of jewelry, the "d" has no place in the label. (No doubt it is used to preface exclamations of dismay when a cab is broken while in the making.)

Place names also should be spelled correctly. A common error is associated with specimens of prehnite from the northern New Jersey city of Paterson. **Note:** only one "t," not two. He was a baron!

The point is that an excellent exhibit can be spoiled by a bit of carelessness. So take your time in preparing your labels, proofread them, and have someone else proofread them, too. We often read what we expect to see rather than what is actually there.

Don't let this discourage you from exhibiting, just be careful when you prepare! ↗

Rock Pillars in Iceland Explained

by Tia Ghose

Editor's note: The piece is adapted from Crack 'n Cab (newsletter of the Gem & Mineral Society of Syracuse, NY), January 2014, p. 5–6. It originally appeared in LiveScience (10/11/13).

The mystery of a series of strange, knobby pillars of rock that formed in Iceland has been solved.

A creeping lava flow and a stream of water mixed to create hollow, rough pillars that dot the Skaelinger Valley in Iceland. The surprise is that these towers could form at all on land. Until now, researchers thought that whenever water and lava met on land, either explosive steam or pillow-shaped lava formed.

"These had never been observed or described before as features seen on land. They've been described at midocean ridges 2 miles underwater," said study co-



Some pillars have moss on them, making them look like tree stumps. Photo: Tracy Gregg.

author Tracy Gregg, a geologist at the University at Buffalo in New York.

Troll Wars?

Gregg was hiking in Iceland in 1998 when she came upon the strange pillars, which look almost like trees without branches. Some of the tallest are 8 feet high and up to 3.3 feet wide.

Local lore had it that trolls fought a war in the valley, tossing these rocks in the process. Gregg was not convinced by the troll war theory. The rough spires looked eerily like features she had been studying deep in the ocean.

“I was so excited. As soon as I saw these things I knew what they were,” Gregg told *LiveScience*.

At midocean ridges (points in the deep ocean where the continental plates are peeling apart), lava seeps out of the ocean floor. Hot water rises up through this pillow lava and cools the nearby lava into rock, and as lava levels rise, spires grow and remain even after lava flows have ebbed.

But no one had ever documented such pillars on land. Unfortunately, Gregg didn’t get a chance to study the pillars again until 2010, when her graduate student Kenneth Christie received a grant to study the structures in Iceland.

Pillar Formation

Gregg and Christie concluded that Skaelinger’s odd formations formed just like underwater lava pillars

during the famed Laki Eruption of 1783, when a volcanic fissure in southern Iceland oozed lava for 8 months. That eruption was so big that it killed at least 50 percent of the island’s livestock and a quarter of its population.

Benjamin Franklin noted Europe’s hazy skies from the volcano’s ash in his journal at the time and made some of the first speculations to link volcanoes and climate, Gregg said.

As slow-moving lava inched its way across the Skaelinger Valley, the lava created a temporary dam on the river that flows through the valley, probably forming a small pond, Gregg said. The meeting of slow-moving lava and water formed spires similar to those found deep in the ocean. Once water levels in the valley fell, the hardened, hollow pillars remained.

The findings may force geologists to rethink how lava and water interact on land. Normally, when water and lava meet, water either drowns the lava, forming pillow-like structures, or the lava heats the water in a flash till it turns to steam that explodes, Gregg said.

It’s also possible that lava pillars may occur elsewhere on Earth. These spires, born in past eruptions, can also provide insight into the historical climate, Gregg said.

“If we find them somewhere else on Earth, it tells us that when that lava was in place, the area was wet,” she said.

She’s also planning to look at high-resolution images from Mars for signs of lava pillars, which would be a telltale sign that the Red Planet once had water. ➤

GeoWord of the Day

(from the American Geoscience Institute)

flame test

A qualitative analysis of a mineral made by intensely heating a sample in a flame and observing the flame’s color, which will indicate the element involved (such as green from copper).

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



A Word From the President Debunking a Few Myths

by Ron Carman, AFMS President

Editor's note: The article is adapted and abridged from the A.F.M.S. Newsletter (June 2017), p. 2.

Visiting the conventions and shows in the various federations reminds me of misconceptions regarding federation shows. Some federations have had trouble finding a society willing to host a federation show and might be scared off by wrong ideas.

Some years ago, I heard the story that an AFMS show could be held only during the months of June, July, and August. Many shows are held during that time, but I have been to many regional and AFMS shows held during other months.

There never has been any requirement for an AFMS show to be held during certain months, and to the best of my knowledge none of the regional federations has such a rule either. Each federation has an annual convention and show, and the host club chooses the date and venue.

The AFMS convention rotates among the seven regional federations, and next year it will be in the EFMLS, with the club that agrees to host it choosing the date and place. If we place too many restrictions on a show, it will become more and more difficult to find a club willing to host it.

Shows are generally held annually, and they need to be held on weekends. There are only so many weekends in a year. Some of those are holiday weekends, not practical for a show. Also, the winter months may not be usable, especially in northern states.

And we must remember that there are many more clubs than weekends in the year, so it's up to each club to determine when and where it can have its show. It's only fair to let the host club choose the date and place.

There are other myths about federation shows, such as that you must always have a large venue with lots of dealers. Again, the host club is the one to decide on the venue and the number of dealers. You certainly don't want a great big exhibit hall that you can't afford to fill or more dealers than the anticipated number of visitors will support.



The 2011 AFMS convention included a campaign for commemorative birthstone postage stamps. Source: AFMS.

Federation shows do involve a few more activities, such as the convention and meal events. Usually, a place for the meetings can be found in either the same building as the show proper or at a nearby host hotel. If the hotel can rent out a number of rooms to show attendees, it will often furnish a meeting place at little or no extra charge.

Federation shows involve at least two meal events, the Editors' Breakfast and the Awards Banquet. In addition, AFMS conventions might have an Officers' Luncheon at the option of the host club.

These events pay for themselves by ticket sales; the attendees buy tickets to pay for their admission. The show committee can work with the host hotel or other organization to cater these events.

Over the past 35 years, I have seen federation shows in all kinds of places, from Houston's Astrodome, to a high school auditorium, to fairgrounds buildings in various cities. In every instance, the committees worked with the venue management and host hotel to make the shows successful. ♪



Safety Matters World Domination Made Easy

by Ellery Borow, EFMLS Safety Chair

Editor's note: The article is adapted from EFMLS News (June 2017), p. 3.



Did you see that? “World Domination Made Easy”—just the title draws attention!

Now, if only I might draw your attention to the actual title of this article: “How to Promote and Promulgate ‘Safety Matters’ Articles to Those in Our Hobby Who Might Most Benefit by Their Content.”

The actual title just does not have the same potential to draw attention.

Truly, safety messages are not the prettiest marbles in the bag. But they sure can win the game. How does a club safety chair or field trip coordinator draw the attention of members when important safety measures are discussed?

Using attention-drawing titles and humor, pounding a gavel, and making messages personal (as in how the matter affects each member personally) are all good ways. Your attention often drifts during safety messages—think of the safety talk given by the head flight attendant just before takeoff.

Messages must often be repeated: think of the person who has never been on a plane before.

When you are delivering a safety message and most members are staring at their laps, you might well imagine that, instead of listening, they are texting. Lap gazing—it’s a sign you’ve lost them.

Gaining and keeping members’ attention for safety messages is important; we all know that. Now, how do we manage that? Here are some ideas:

- Try using an authoritative tone of voice.
- Engage the members, keep the topic relevant, and tell stories to illustrate your message.
- During your talk, ask whether anyone has questions.
- Mix repeat messages with new material.
- Ask members whether they can think of how they might apply the topic to what they do in the hobby.


- Try keeping your talk relatively short (so as not to overload the members).
- Try approaching a repeat topic in a new manner.
- If members are texting, ask whether they are texting about safety. (I know it’s lame humor, but that’s what I do.)

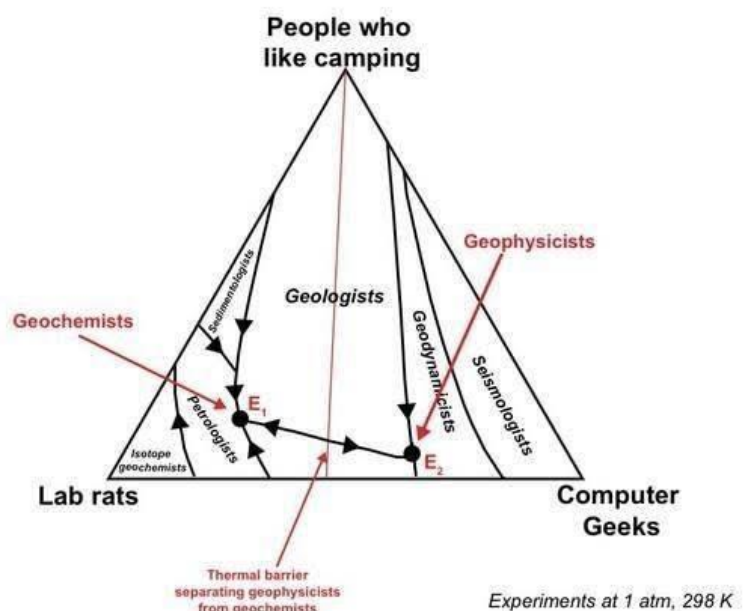
How do you know whether members are engaged? Ask. If a member can repeat what has just been discussed and how it can be applied in various situations, then you’ve engaged one member! Pat yourself on the back and offer yourself a high-five on a talk well presented!

Safety does not have to be boring, but it does take a certain amount of engagement to keep it interesting. Telling stories to go with repetitive messages helps make them memorable.

You certainly don’t want to refer to world domination in a safety message title. But you get the idea! I’m sure you can think of something more suitable to draw attention.

Gaining and holding members’ attention when delivering safety messages are good things. My hardhat is off to you dedicated safety and field trip chairpersons. Thanks for doing such a great job in getting those safety messages out to your members.

Oh, and speaking of world domination, it sure would be nice if safety messages were more often featured in our club newsletters and bulletins! Just sayin’! .



Classification of rockhounds.

Traprock: What's in a Name?

by Hutch Brown

The terminology we use in our hobby can be confusing, and it can be tempting to leap to the wrong conclusions.

Last spring, I did exactly that.

Some quarries in our area are in what mineral collectors loosely call “traprock,” a term that refers to rock from upwelling magma that cooled into basalt or diabase. It can even refer to metamorphic forms of diabase, such as metagabbro.

Diabase is traprock that never reached the Earth's surface. It formed dikes and sills underground, presumably because it was trapped between or under parts of existing rock formations.

Trapped ... traprock ... in my ignorance, I leapt to a conclusion: I assumed that the term “traprock” comes from trapped rock.

Wrong!

Torbern Bergman (1735–1784), a prominent 18th-century Swedish geologist, observed that ancient lava flows that cooled into columnar basalt sometimes form steplike gradations in height due to successive flows or to variations in exposure to erosion (Tayler 1855). Giant's Causeway in Ireland is a perfect example of what Bergman called traprock.



Giant's Causeway, Ireland. Source: Wikipedia.

Why “trap”? The word for step in Swedish is *trappa*, closely related to the German word *Treppe*. The step-like appearance of some basalt formations motivated Bergman to invent the term “traprock.”

Club member Dave Hennessey did me the great honor of nominating my own wild guess as an official “alternative fact.” As a bonafide purveyor of alternative fact, I am humbled to be in such august company these days! ♫

Source

Tayler, W. Elfe. 1855. *Geology: Its facts and its fictions*. London: Houlston and Stoneman.

Was the Virginia Mastodon Really There?

Thanks to Sue Marcus for the reference!

Early on, Gerald Johnson feared he was in the wrong spot. For more than a week, he dug along a creek in Yorktown, VA, searching for mastodon bones and finding nothing.

Turned out he was in the right spot after all. The excavation has produced dozens of bones and even a pair of tusks from an animal that lived and died about 12,000 years ago. [Read more.](#)



Trick or Treat! Professor Gerald Johnson shows that the mastodon really was there. Source: Washington Post.

Book Review **Geology and the** **Gettysburg Campaign**

by Hutch Brown

This wonderful little book by USGS geologist and Civil War buff Andrew Brown was published in 1962 to commemorate the centennial of the Civil War (1861–1865). Now in its eleventh printing, the 14-page booklet is published by the Pennsylvania Department of Conservation and Natural Resources. You can get it from the Pennsylvania Geological Survey, buy it online at Amazon.com, or download it [here](#).

Both the geology and the history are fascinating, and this booklet shows how they interconnect.

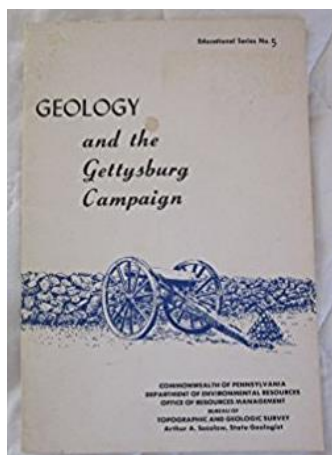
By the summer of 1863, the Civil War was in its third year. The Union was winning: generals like Ulysses S. Grant were defeating Confederate forces in the west and about to take control of the entire Mississippi River. The U.S. Navy controlled the seas and imposed an effective blockade while also seizing southern ports and key coastal areas.

In the east, however, Confederate General Robert E. Lee's Army of Northern Virginia had fought the Union Army of the Potomac to a standstill. Lee had inflicted bloody losses on the Union army at Fredericksburg (December 1862) and Chancellorsville (May 1863). But Lee's successes had simply staved off defeat. Lee needed a decisive victory to win the war.

So he invaded the North. If he could seize Harrisburg, the capital of Pennsylvania, and force the Army of the Potomac to attack him, then his troops might prevail in a defensive battle, as they always had before. The European powers might then intervene, forcing the Union to negotiate a favorable settlement.

Unfortunately for Lee, the landforms worked against him. They forced him into an offensive battle against a superior enemy with better lines of supply, communication, and reinforcement. The Union held the high ground (shown at right), and the rocks decided the 3-day Battle of Gettysburg (July 1–3, 1863).

The rocks were diabase. If you've been to the Vulcan quarry in Manassas, VA, you've hammered diabase. It originated as upwelling magma about 230 million



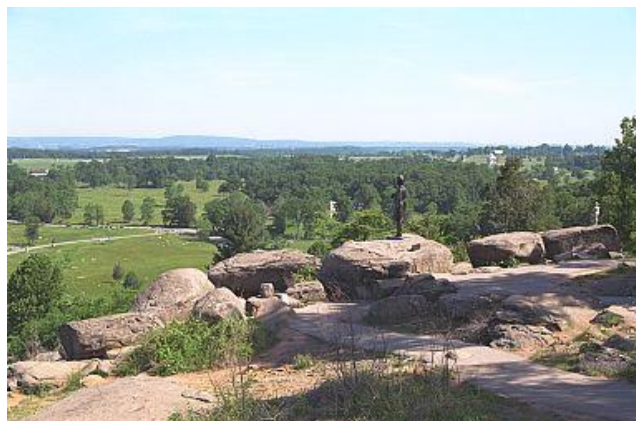
years ago as the supercontinent of Pangaea broke up. Africa rifted away from North America, reactivating ancient suture lines. Great blocks of Piedmont rock slid down the faces of Blue Ridge landforms like Bull Run Mountain in Virginia, Catocin Mountain in Maryland, and South Mountain in Pennsylvania.

At the bases of these ridges, great rift valleys formed the Triassic basins. The basins gradually filled in with sediments that hardened into sandstone, siltstone, and other rock. Volcanic activity left huge sills and dikes of diabase trapped in the sedimentary rock. In time, erosion of the softer sedimentary layers exposed the harder diabase, forming ridges and hills.

The town of Gettysburg, PA, abuts a massive diabase sill. The sill ranges from Culp's Hill in the north down Cemetery Ridge to Little Round Top (shown below) in the south. By the end of the first day of battle, the Union army was occupying the high ground. For the next 2 days, the Confederate army tried in vain to storm every part of the Union line.

On July 4, after relentless defeats, Lee withdrew. He was lucky to get his battered army back to Virginia. However, the Union army was also in bad shape. Because it was impossible to dig fortifications in the diabase, Union forces had taken unusually high casualties for an army fighting a defensive battle.

Geology played a huge role in the whole Gettysburg Campaign. Brown describes how it influenced the movements of both armies and eventually led them to clash at Gettysburg against the wishes of both commanding generals. For anyone interested in the confluence of history and geology, this is a great read. ↗



*Diabase boulders on Little Round Top.
Source: Gettysburg National Park.*

Save the dates!

Field Trip Opportunities

The Northern Virginia Community College's campus in Annandale offers 1-day weekend courses—essentially, field trips—related to our hobby. You can register and get more information at the [Field Studies in Geology—GOL 135 Website](#).

Building Stones of the National Mall

October 14, 9 a.m.–6:30 p.m. Visit over 20 National Mall sites, examining the geologic history and architecture and the rocks used to construct the federal buildings and monuments there. ↗

Geology of Holmes Run Gorge

November 18, 9 a.m.–5:30 p.m. Holmes Run Gorge is a canyonlike area in Alexandria. Attend a 3.5-hour class at the college, followed by a 5-hour geologic tour of the gorge. Then you have 2 weeks to complete an online assignment.



2017 AFMS Contest Results

by Hutch Brown, Editor

Each year, the regional and national club federations hold a contest for newsletters. Our club has routinely submitted both sample newsletters and individual articles for judging in the contest.

The regional federations judge the submissions first, then send the top three winners in each category for a followup contest by the national federation, with the results announced in the fall.

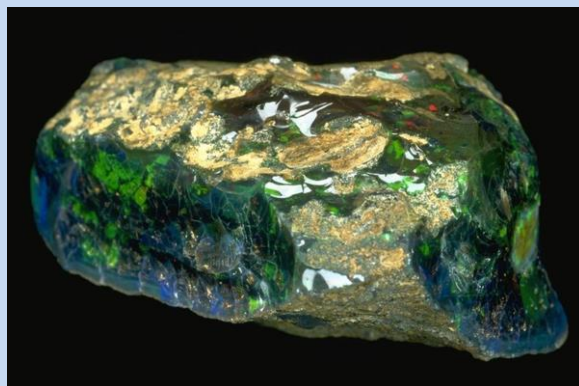
As of October 1, the regional contest results were still unreported, but the [national results](#) were known. Our club's submissions in at least two categories advanced from the regionals to the nationals.

AFMS results for our club:

- Large Newsletters, 4th place:
The Mineral Newsletter ([December 2016 issue](#))
- Written Features, 8th place:
Mike Kaas, "Getting the Big [Geologic] Picture" ([February 2016 issue](#))

Congratulations, Mike! And we can all feel proud that our newsletter overall did so well. ↗

The Roebling Opal



The Roebling Opal in the [Smithsonian Mineral Gallery](#). Photo: Chip Clark.

The Roebling Opal is an extraordinary 1.5-pound, 2,585-carat piece of opal rough. The opal was discovered in 1917 in Nevada's Virgin Valley by Col. W.A. Roebling, an engineer; in 1926, he donated the specimen to the Smithsonian Museum of Natural History.

Opal is a hydrated amorphous form of silica ($\text{SiO}_2 \cdot n\text{H}_2\text{O}$), with the same chemical formula as quartz. Its water content is usually between 6 and 10 percent. Because of its amorphous character, it is classified as a mineraloid, unlike crystalline forms of silica, which are classified as minerals. Opal forms from water that picks up silica as it seeps through sandstone. The silica is deposited at low temperatures in the fissures of almost any kind of rock, but most commonly in limonite, sandstone, rhyolite, marl, and basalt.

The Roebling Opal was deposited from silica-rich water in voids that remained after tree limbs from a forest buried by volcanic ash had rotted away. In some cases, opal casts of the original tree parts resulted; the Roebling Opal is an example. Although extremely beautiful, opal from this locality is not commonly used in jewelry because it tends to crack.

Opals with a vivid play of color on a dark base are called black opals. The Roebling Opal is a black opal with flashes of blue and green.

Sources: *Smithsonian Mineral Gallery*; *Wikipedia*.



The Rocks Beneath Our Feet **Lake Drummond: A Carolina Bay?** **Part 1**

by Hutch Brown

Editor's note: This is the fourth in a series on Virginia's Lake Drummond and its origins. The previous articles are in the [April](#), [June](#), and [September](#) 2017 newsletters.

Lake Drummond, located in the Great Dismal Swamp on the Coastal Plain of Virginia, is a mystery. Nearly circular in shape (fig. 1, top), the lake is huge—about 2-1/2 miles across. Yet it is only 6–7 feet deep. Its origins are uncertain, but one thing is clear: Lake Drummond is not the only large and shallow depression on the mid-Atlantic Coastal Plain.

Carolina Bays

From Florida to New Jersey, the Coastal Plain is littered with about 500,000 similar depressions. Some contain lakes that are almost round (fig. 1, middle), but all are depressions that are elliptical in shape (fig. 1, bottom). Some of the depressions are or contain lakes, but most were originally wetlands, although many have since been drained for farming. Like Lake Drummond, the lakes and swamps in the depressions are fed by ground water rather than by surface inflows; and, like the Great Dismal Swamp, they have accumulated thick layers of peat.

The swampy depressions are called pocosins, a word from the native Algonquian languages spoken on the Coastal Plain in the mid-Atlantic region, including by the Powhatans of Virginia. *Pocosin* means “elevated bog,” probably to distinguish the upland swamps from the boggy parts of lowland floodplains. Particularly abundant in the Carolinas, the pocosins feature such water-loving trees as sweetbay, redbay, and loblolly bay; hence they became known as bay swamps and, later, Carolina bays.

You can find Carolina bays mainly in unconsolidated sediments, mostly in Coastal Plain marine sediments but also in Piedmont riverine sediments. They tend to have elevated rims of sand, with sparse vegetation in the sandy soils (fig. 2). The bays range in length from 200 feet to 7 miles—and in depth from a few feet to 50 feet (Howard 2013). They are uniformly deepest toward the southeast, where their rims tend to be highest, up to 23 feet high.



Figure 1—Lake Drummond (top) resembles other shallow basins on the Coastal Plain, known as Carolina bays (middle, bottom). Sources: Top—Panoramio, Google Maps; photo: Ken Riley. Middle—Poland (2013); photo: George Howard. Bottom—Zamora (2013); Lidar image of Bowmore, NC.



Sweetbay, a kind of magnolia, flourishes in southern wetlands, giving the Carolina bays their name. Source: Wikipedia.



Figure 2—Side-by-side Carolina bays, showing the typical sandy rims, where less vegetation grows in the poor soils. (Top of photo is west.) Source: Howard (2013); photo: George Howard.

If Lake Drummond is—or is in—a Carolina bay, then whatever created the bays also created Lake Drummond. So where did the Carolina bays come from?

Theories Abound

People have advanced at least 19 different theories to explain the lakes and swamps in the Carolina bays. As early as 1847, a geologist speculated that wind lapping the waters of shallow lakes shaped the bays into ellipses. Others have theorized that sandbars formed lakes when the coastal seas retreated or that the underlying limestone dissolved, forming depressions (in effect, sinkholes).

But no one realized the sheer numbers of the Carolina bays or understood the uniformity of their features until aerial surveys began in the 1930s. Lidar images in particular, which show geographic relief through the overlying vegetation, have revealed the stunning abundance of the Carolina bays and their largely identical configurations (fig. 3). Some bays even overlap or overlie others, suggesting a sequence of formative events, possibly within a short timespan.

The aerial images resemble a moonscape, leading scientists to speculate about a meteor shower. But meteors tend to leave craters that are much deeper than the Carolina bays. Moreover, none of the bays have yielded direct evidence of extraterrestrial origins, such as meteor fragments or shocked quartz. The meteor strike theory for the Carolina bays, just as for Lake Drummond, seems unlikely.

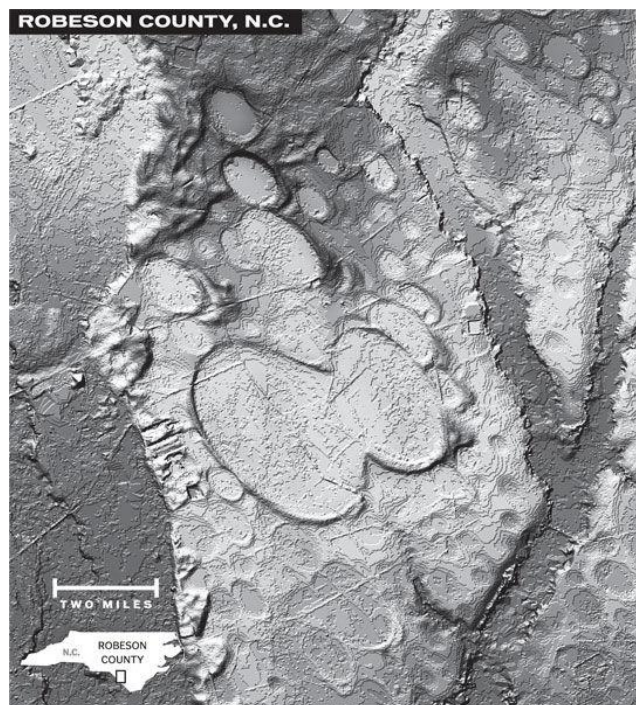


Figure 3—A North Carolina landscape covered with Carolina bays, some overlapping or obliterating others, suggesting that they formed sequentially but possibly at about the same time. Source: Tennant (2008a).

Yet an extraterrestrial origin cannot be ruled out. Two competing theories in particular seem to be prominent today (Howard 2013): (1) the effects of wind and water on permafrost plains; and (2) a comet strike during the last Ice Age.

Wind and Water

The Carolina bays resemble the permafrost lakes and ponds near the Arctic Circle today (fig. 4). About 18,000 years ago, the Laurentide ice sheet was at its maximum extent, reaching into what is now central New Jersey and east-central Pennsylvania. The climate in our area would have been much like that in parts of Alaska and northern Canada today. The coastal parts of our area might have had permafrost and summertime meltwater lakes and ponds across wind-swept plains.

Moreover, the prevailing winds in the mid-Atlantic region are from the west and northwest. Some scientists hypothesize that high winds associated with the glaciers drove standing waters above the Pleistocene permafrost in our area to the southeast, much like the wind-aligned permafrost lakes today (Zamora 2013).



Figure 4—Permafrost thaw ponds in Alaska show a similarity to the Carolina bays—but also differences, such as inconsistent configurations. Source: Zamora (2013).

In meltwater lakes, the waves and the churning currents would have dug out lake bottoms to the southeast and eroded southeastern shores, creating elliptical basins with high sand rims at their southeastern ends—in effect, sand dunes. The results would have closely resembled today's Carolina bays.

Dissimilarities

Or not.

Today's permafrost ponds and lakes do not have the same degree of consistency in their length-to-width ratio as do the Carolina bays (Zamora 2013). Nor do they have raised rims—or show the same kind of intersection and overlap (figs. 1, 3). The overlapping bays suggest the possibility of multiple depression-forming events happening sequentially within a relatively short period of time, like overlapping spatters in the dust left by large raindrops before a downpour.

Moreover, some Carolina bays show no evidence of ever having contained standing water. In Bladen County, NC, for example, scientists collected core samples along the axis of a 1.6-mile-long Carolina bay (Howard 2013). They found the sediments to be composed entirely of eolian (wind-blown) sands, with no trace of peat or other evidence of a past lake or swamp environment.

Bays that never contained water could not have originated as permafrost lakes and ponds. That suggests a completely different origin for the Carolina bays.

Something created hundreds of thousands of shallow depressions on the mid-Atlantic Coastal Plain and Piedmont. Many of the holes later filled with ground water to become lakes and swamps. But other holes remained dry, filling instead with eolian sands, much like the wind-blown glacial silts (loess) that blanketed most of the Midwest during the Pleistocene, forming its fertile soils.

So what dug all those sandy holes?

Comet Strike?

An alternative to the permafrost theory is a comet strike towards the end of the last Ice Age. A comet striking the Laurentide ice sheet near the Great Lakes would have sent fragments of ice into the atmosphere. A lethal storm of giant hailstones would have spattered across the Atlantic seaboard, digging the Carolina bays—and dooming the mastodons and many other Pleistocene animals to extinction. ↗

Next: Did a Pleistocene comet strike result in the formation of Lake Drummond?

Acknowledgment

The author thanks NVMC member Sue Marcus for reviewing and improving the article. Any errors are the author's alone.

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October 2017—Upcoming Events in Our Area/Region (see details below)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4 MSDC mtg, Washington, DC	5	6	7 Show: Macungie, PA
8	9 Columbus Day GLMSMC, Rockville, MD	10	11	12	13 Symposium: Baltimore, MD; auction: Oella, MD	14 Symposium: Baltimore; NOVA field trip
15 Symposium: Baltimore, MD	16	17	18	19	20 EFMLS annual mtg	21 EFMLS convention Show: WV
22 EFMLS convention Show: WV	23 NVMC mtg, Arlington, VA	24	25 MNCA mtg, Arlington, VA	26	27	28 Show: Fair- less Hills, PA
29 Auction: Bethesda, MD	30	31 Halloween				

Event Details

- 4: Washington, DC**—Monthly meeting; Mineralogical Society of the District of Columbia; 7:45–10; Smithsonian Natural History Museum, Constitution Avenue lobby.
- 7: Macungie, PA**—2017 Autumn Mineralfest Show; Pennsylvania Earth Sciences Association; Macungie Memorial Park; info: www.mineralfest.com.
- 9: Rockville, MD**—Monthly meeting; Gem, Lapidary, and Mineral Society of Montgomery County; 7:30–10; Rockville Senior Center, 1150 Carnation Drive.
- 13: Oella, MD**—Chesapeake Gem & Mineral Society Auction; 2414 Winchester Ave; preview 7, auction 7:30.
- 13–15: Baltimore, MD**—Annual Desautels Micro-mount Symposium; Baltimore Mineral Society; info/registration: www.baltimoremineralsociety.org.
- 14: Washington, DC**—Geology field trip, National Mall buildings; 9–6:30; NOVA; info, reg: [GOL 135 Website](http://GOL135Website).
- 20: Bristol, CT**—EFMLS Annual Meeting; info: <http://www.amfed.org/efmls/convention.htm>.

- 21–22: Bristol, CT**—45th Annual Gem & Mineral Show and 67th Eastern Federation Convention; Bristol Gem & Mineral Club; Beals Community Center, 240 Stafford Ave; info: amfed.org/efmls.
- 21–22: So. Charleston, WV**—44th Annual Jewelry, Gem, Mineral & Fossil Show and Sale; Kanawha Rock & Gem Club; So. Charleston Community Center, 601 Jefferson Rd.
- 23: Arlington, VA**—Monthly meeting; Northern Virginia Mineral Club; 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.
- 25: Arlington, VA**—Monthly meeting; Micromineralogists of the National Capital Area; 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.
- 28: Fairless Hills, PA**—28th Annual Ultraviolet Show; Rock & Mineral Club of Lower Bucks County; 1st United Meth. Church, 840 Trenton Rd.
- 29: Bethesda, MD**—Auction; Gem, Lapidary and Mineral Society of Montgomery County; preview noon, live auction 2; Woman's Club of Bethesda, Old Georgetown Rd & 5500 Sonoma Rd; info: Al DeMilo, abdemilo@verizon.net.

NEW GMU LOCATION FOR 2017!!



Presented by The Northern Virginia Club, Inc.

www.novamineralclub.org

Sponsored by the Dept. of Atmospheric, Oceanic and Earth Sciences at GMU

Date: November 18 & 19, 2017

Place: Dewberry Hall, Johnson Center
George Mason University Campus
Braddock Rd. & Route 123, Fairfax, VA

Hours: Saturday 10 am - 6 pm, Sunday 10 am - 4 pm

Admission: Adults: \$6, Seniors: \$4, Teens (13-17): \$3
Children 12 & under & Scouts in uniform are FREE
GMU Students w/valid ID are FREE

\$1 OFF

Adult admission
with this card
(applies to all adults
+ seniors in your
group)

Demonstrations, Exhibits, Kids Activities, and Door Prizes.
Mini-mines for children to dig in and get free fossils and minerals.
Over 20 Dealers with Fossils, Minerals, Crystals and Gems for sale.

Use Parking lot A, enter Lot A from Nottoway River Lane.
Look for our Courtesy Shuttle & Designated Walking Path to Mineral Show

Please help get the word out!
Print out and distribute the flyer!

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



**Mineral of
the Month:
Scheelite**

PLEASE VISIT OUR WEBSITE AT:

<http://www.novamineralclub>

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The Northern Virginia Mineral Club

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

RENEW YOUR MEMBERSHIP!

SEND YOUR DUES TO:

Rick Reiber, Treasurer, NVMC
PO Box 9851, Alexandria, VA 22304

OR

Bring your dues to the next meeting.

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>).

Dues: Due by January 1 of each year; \$15 individual, \$20 family, \$6 junior (under 16, sponsored by an adult member).

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 22204. (No meeting in July or August.)

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