THE NORTHERN VIRGINIA MINERAL CLUB INC

The Mineral Newsletter

Meeting: March 27 Time: 7:45 p.m.

Long Branch Nature Center, 625 South Carlin Springs Road, Arlington, VA

Smithsonite

with aurichalcite
Kelly Mine, New Mexico

Photo: Tom Tucker.

Volume 58, No. 3
March 2017
Explore our Website!

March Meeting Program:

Spring Club Auction

In this issue …

Mineral of the Month
Smithsonite

by Sue Marcus

When you think of smithsonite, does your mind's eye, like mine, drift fondly to the aqua hues of specimens from the famous Kelly Mine, like the one featured on the cover? Or do you have a favorite smithsonite in one of its other rainbow colors or forms?

Smithsonite is an easy mineral to enjoy and to collect—at least by the "silver pick" (purchasing rather than self-collecting). In its botryoidal forms, the bumps and lumps may be pink, green, yellow, white, or that lovely "Kelly blue," along with other shades, including brown.

Or smithsonite can form attractive individual crystals, rarely large, though frequently transparent or translucent. Mindat (2017) showed 3,725 photos of smithsonite. Smithsonite is photogenic and abundant enough for collectors to have enough specimens to share beautiful images.

Chemically, smithsonite is zinc carbonate, with the formula $ZnCO_3$. Zinc ores have been known and exploited for ages—literally! Zinc was used to make bronze as early as 3,000 BC. Georgius Agricola (the early German mineralogist born as Georg Bauer in his native Saxony—*Bauer* and *agricola* both mean farmer) used the term "Lapis calaminaris" for zinc ore in his best known and foundational book on mining, *De Re Metallica*, published in 1556.

You might think, with a name like smithsonite, that the "type locality" where the mineral was originally found and described would be in England (land of James Smithson, of Smithsonian fame). The mineral was indeed named for him by François S. Beudant in 1832. However, calamine was the name used by the Swedish mineralogist Johan Gottschalk Wallerius (or Vallerius) for zinc carbonate in 1747; for reasons unknown to me, that name did not stick with the mineral.

Another Swede, Torbern Bergmann, analyzed calamine samples in 1780 and found mixtures of zinc carbonate and silicate. In 1803, James Smithson, following up on the work of Bergmann, studied calamine ores more thoroughly and discovered that they comprised two separate minerals, a carbonate and a silicate. It was the carbonate identified by Smithson that was eventually named to honor him. The silicate became hemimorphite. According to Dana (1966), the mineral name calamine is now used for the chemical compound $(ZnOH)_2SiO_3$.

Coloration in smithsonite can be caused by trace amounts of iron, manganese, cobalt, cadmium, indium, or even abnormal amounts of calcium in the crystal lattice (structure). Green or blue smithsonite contains traces of copper. Cobalt causes the pink color in

Happy St. Patrick's Day!

Northern Virginia Mineral Club members,

Please join your club officers for dinner at the Olive Garden on March 27 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.

Smithsonite on dolomite, from Tsumeb, Namibia. Source: Wikipedia; photo: Rob Lavinsky.

smithsonite, just as it does in calcite. Iron turns smithsonite brown or orangey-brown. Cadmium causes a yellow or orange color; recent specimens of cadmium-rich smithsonite from China are pricey, and some of the yellow ones fluoresce.

The yellow form is sometimes called "turkey-fat ore." Miners called honeycombed, fine-grained, brown or off-white, massive smithsonite "dry bone ore," although they sometimes used the term more loosely for all forms of smithsonite.

Along with its variety of colors, smithsonite occurs in a variety of forms. It is commonly botryoidal, although it can also form stalactites and stalagmites. Large rhombohedral crystals are relatively rare. Scalenohedrons are also found.

As a zinc ore, smithsonite has a geologic affinity for ores rich in galena and sphalerite, so the three minerals are often found together. Smithsonite forms at low temperatures and pressures from the oxidation of sphalerite, so it is found towards the top of ore deposits. Therefore, it is a "supergene" ore—superposed above the original orebody.

Hemimorphite, another supergene zinc mineral, and cerussite, the lead carbonate analogue to smithsonite, also occur together.

The Kelly Mine in New Mexico is the source of many famous eye-catching specimens—and of smaller favorite pieces for the rest of us. Ask Tom Tucker to tell you about collecting at the Kelly Mine. Perhaps Pat Hayes and Fred Parker, who moved to that area, have collected there, too.

Tsumeb, Namibia, though a major copper producer, also has beautiful smithsonite specimens. Botryoidal pink specimens have been found there, along with clear, white, yellow, and green macrocrystals. If you browse through the pages of photos of smithsonite on Mindat, you'll see that Tsumeb has produced every possible color and form of smithsonite.

Deadline for Submissions

March 20

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

Mexico also produces beautiful smithsonite specimens from copper and zinc mines in Sinaloa, Chihuahua, Zacatecas, and other states.

The type locality for smithsonite is difficult to discern. I believe it is the Singing River Mine, Shipham, Mendip Hills, Somerset, England (Pracejus 2015), because smithsonite, as a mineral material, was known long before it was named. The Mendip Hills locality is probably where James Smithson's material came from.

According to Gemdat.org (2017), smithsonite is cut and polished as a gemstone in faceted and cabochon forms. But I wouldn't advise wearing it unless it is well protected from abrasion because the mineral is relatively soft. A quirky fact is that "Bonamite" is the name given to cabs made from smithsonite. Some sources also state that the term "Bonamite" is used for any smithsonite in the gem trade.

Technical details:

Chemical formula	$ZnCO_3$
Crystal form	trigonal
Hardness	4–4.5 (Mindat 2017); 5–5.5 (Gem.dat 2017); 5.5 (Dana 1966)
Density	4.42–4.45 g/cm^3 (measured)
Color	almost any—aqua, green, orange, yellow, pink, white, clear
Streak	white
Cleavage	perfect in one direction
Fracture	usually irregular
Luster	pearly, vitreous, silky when botryoidal

Sources

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Cahn, R.W. 2011. Georgius Agricola: German scholar and scientist. Encyclopedia Britannica.

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Webmineral.com. N.d. Smithsonite mineral data.

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Club Member Rocks and Minerals Auction Coming Up!

March 27 Program

Our March club meeting will feature our Spring 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. Bid slips are contained in this newsletter below. Just print out as many pages as you need.

And 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.

And 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 $1 on any item. Bids higher than $20 increase by $5.
- We start with a silent auction, so look carefully and start bidding. Items with multiple bids during the silent auction will be brought sooner to the vocal auction.

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

The Prez Sez

by Bob Cooke, President

I've been sitting here for 10 minutes, staring at the computer screen and wondering what witty comments should go into this month's Prez Sez. Talk about writer's block! This is writer's lithification, or is that petrification?

So who wants to be club president next year? I have promised Rick Reiber that I would run for treasurer next year in order to allow him to retire after 10 years as club treasurer. Since I don't intend to fill both positions at once (would that be a treasident or a pressurer?), that means some lucky person gets to be your next president.

Start making up your excuses. I'm contemplating a change in the bylaws to allow the nominating committee to recommend candidates without their consent. Yeah, that might be efficacious!

March just might be a busy month: Delaware Mineral Show on the 4th and 5th; GLMS-MC Mineral Show in Gaithersburg on the 18th and 19th; NVMC Spring Club Auction on the 27th; and the Atlantic Micromounters' Conference on the 31st and the 1st of April. I'm feeling excited and exhausted at the same time.

Hutch Brown has reminded me that the masthead design for this newsletter looks dowdy and amateurish compared to the logos of many other newsletters. Besides, as a black-and-white line drawing, it looks out of place in a color newsletter, especially on a cover featuring a high-quality color photo of a spectacular mineral.

That presents a great opportunity for those of you artists who are frustrated by the monochrome, line-art limitations of the Name Tag Contest (see the next page). While it would be desirable to have some correlation between the masthead and name tag logos, the connection is rather tenuous, and NVMC members have a lot of artistic license. Hutch will have more to say on this at future meetings.

That's enough rambling for now. It's time to go play with some minerals.

Bob

Name Tag Contest

by Bob Cooke, President

This is your friendly reminder that the NVMC is having a contest to select a design for new name tags. The trophy shop that previously produced our name tags has gone out of business and taken our old name tag template with it to Never-Never Land.

If we're going to make a new template, we may as well have an open mind about it. The old design will be one of the candidates in the contest. However, I believe someone can improve upon that basic design.

The old design included the graphic in the masthead for this newsletter, as well as the individual's name and hometown and the club name. Some people like including the hometown, others don't. Some like the starburst pattern emanating from the crystal cluster, others don't. Make up a sketch of what you like.

Several club members have pointed out to me that the NVMC has two large banners that we display at our annual club mineral show. The banners feature the old motif. We can tweak the design and continue to use the banners or we can create a whole new design for name tags and retain the old design for the Website, newsletter, and banners. We have options!

For the name tag, if you have an idea for a new map or other graphic, don't include color. We need a simple black-and-white line drawing. (Replacing the newsletter masthead, if at all, is a separate issue.)

Final selection will be by popular vote at the NVMC April meeting. If you can't be there, have a friend bring your design. Or you can email your proposal to me at rdotcooke@verizon.net.

Meeting Minutes
February 27, 2017

by David MacLean, Secretary

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

The minutes of the January 23 club meeting were approved as published in *The Mineral Newsletter*.

Old Business

The president announced that he sent a letter to members who receive the club newsletter by regular mail urging them to receive it instead by email.

Club dues of $15 per individual or $20 per family are due by April 1. You must have paid your dues to receive printed copies of *The Mineral Newsletter* or to go on club field trips.

The president intends to continue former President Wayne Sukow's efforts to examine and propose changes to the NVMC bylaws.

A name tag contest announcement is in this issue of *The Mineral Newsletter*. Proposed designs should be simple line drawings in black and white and without shading. Members will vote on the proposed designs at the club meeting on April 25.

The Micromineralogists of the National Capitol Area are offering for sale 10x unlighted loupes for $5 and 20x lighted loupes for $10.

New Business

The president noted that the board of the Gem, Lapidary, and Mineral Society of Montgomery County meets to decide on and execute most club business, thereby minimizing the time at club meetings devoted to business. He suggested that the NVMC board do the same.

For example, the NVMC board would approve recipients for scholarships and make spending decisions up to the member-approved limits for various categories in the annual club budget. At club meetings, members would still vote on the annual budget and on any changes in bylaws.

NVMC members were in general agreement with this approach. The president will include this in proposed bylaw changes.

Announcements

The Delaware Mineralogical Society will hold its show in Newark, DE, on Saturday, March 4. The Delaware Mineral Museum is worth a visit.

The Gem, Lapidary, and Mineral Society of Montgomery County will hold its show on Saturday, March 18, from 10 a.m. to 6 p.m., and on Sunday,

March 19, from 11 a.m. to 5 p.m. at the Montgomery County Fairgrounds in Rockville, MD

The annual Atlantic Micromounters' Conference coincides this year with the 50th anniversary of the Micromineralogists of the National Capital Area. The conference will be held on Friday, March 31, from 6 to 9 p.m. and on Saturday, April 1, from 9 a.m. to 9 p.m. at the SpringHill Marriott Motel in Alexandria, VA. (See the article below on page 11.)

The **Spring Club Auction** will be held at the next NVMC meeting on March 27 at the Long Branch Nature Center. (See the announcement above on page 4.)

Door Prize Drawing

Door prize winners were Jackie Benefield, Geraldine Cox, Holly Perlick, Ken Reynolds, Tom Taaffe, Andrew Yoo, and Jason and Celia Zeibel.

Presentation

Before the business meeting, Carlin Green delivered the club program for the meeting. Carlin, a student at George Mason University, is a recipient of a grant from the NVMC's Fred Schaefermeyer Scholarship Fund. Carlin was introduced by a fellow student and by GMU Professor Julia Nord, his thesis advisor.

Carlin's presentation was on the topic of his Master's thesis: "Characterization of Amphibole Minerals in the Ironwood Iron-Formation." The formation is in northern Wisconsin's Gogebic Range, part of the region's iron mining industry. Carlin's work, in conjunction with the U.S. Geological Survey, is to characterize amphiboles in the iron-bearing rock for the possible presence of asbestiform minerals, a potential health hazard.

Details on Carlin's presentation will be forthcoming in a future issue of *The Mineral Newsletter*.

Visit to George Mason University

by Bob Cooke, President

In response to an invitation from Professor Julia Nord of George Mason University, about 20 NVMC members gathered on February 18 in Exploratory Hall to tour the GMU Geology Department.

Professor Nord explained the hierarchy of geology classes at GMU and why she has tailored separate mineral collections for each level. She also provided a brief tutorial lesson on optical mineralogy, demonstrating how minerals can be identified by the patterns revealed when polarized light shines through a slice of the mineral that is 30 micrometers (30 millionths of a meter) thick. (By contrast, a human hair is 40 to 120 micrometers thick.)

At the conclusion of Julia's talk, we had a chance to roam around the classrooms and gawk at the picturesque minerals in the GMU collection. The hit of the exhibit, by far, was "Frankie," a large fluorescent specimen from Franklin, NJ, with remnants of two blasting drill holes forming what appeared to be eye sockets in Frankie's head.

If you weren't there, you missed a great trip! Professor Nord has promised us another tour next year. But first we need to get through the 2017 GMU/NVMC Mineral Show.

Professor Julia Nord speaking before NVMC members at GMU (top) and Dave MacLean admiring specimens in the GMU mineral collections (bottom). Photos: Bob Cooke.

Best Wishes to Gerry Cox!

Longtime NVMC member Gerry Cox is going through an operation soon for a serious medical condition.

Gerry, we wish you all the best in your medical treatments—and a speedy recovery! You are in our prayers!

Get well soon, Gerry!

NVMC

How to Spot a Fake Piece of Amber

by Brian Miller

Editor's note: *The piece is adapted from* West Seattle Petroglyphs *(newsletter of the West Seattle Rock Club, Seattle, WA), May 2015, p. 5. It originally appeared in* The Golden Frog, *April 2015.*

When I see amber, I instantly think of the movie Jurassic Park. If you have seen the movie, you've seen the techniques used to extract amber that's been entombed for generations and finally unearthed for human eyes to see.

Before and after the movie, many people took advantage of high prices for amber by producing fakes. Since precious amber is harder to come by these days, fakes have popped up all over the market.

Humanity has a sneaky way of mimicking amber, and it takes a keen eye or nose to figure out if you have a true piece. There is art to figuring out the fakes. Here are some simple techniques that might save you money and heartache.

Research has shown: If amber is vigorously rubbed against fur, it will produce static and an aroma of pine. Many plastics might replicate the static but the smell of pine is always a good hint that the amber is genuine.

Heating a pin and touching the side of the piece of "amber" should produce that pine resin smell, too. If you smell burnt plastic, then it is obviously a fake.

Another cool treatment is the water method. By mixing a large amount of salt with water in a bowl or bucket, your amber should float. If not, you may have another plastic fake.

With all these useful techniques, it should be easier for you to spot a fake and find the true treasure.

Amber Waves of Pele's Hair?

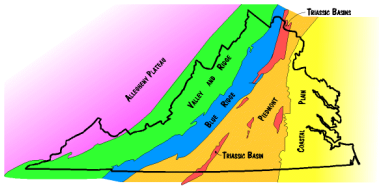
Thanks to Sue Marcus for the reference!

The lava lake within Halemaʻumaʻu Crater at the summit of Kīlauea Volcano on the Big Island of Hawaiʻi is creating a scene remindful of a messy barbershop floor, except that it's acres and acres wide rather than a few square feet. The ground downwind of the crater is strewn with Pele's hair—long glass fibers that form when gas bubbles burst in the lava lake. *Read the story*.

Gigantic Geode Found in Spain

Thanks to Sheryl Sims for the reference!

A gigantic cave of crystals has been discovered in an old silver mine in Spain. It occupies a space about 26 feet long by 6 feet wide by 5.8 feet high on average. It is located at a depth of 164 feet in the Pilar de Jaravía mine, Sierra del Aguilón, municipality of Pulpí, about 2 miles from the coast. *Read the story*.



Website Review

The Geological Evolution of Virginia

by Hutch Brown

My interest in our hobby has to do with landforms: mountains, islands, basins, valleys, even rocks and soils—how did they get there? Such features of the landscape shape the overlying forests and other vegetation, which I try to understand because I work for the U.S. Forest Service.

So when I joined our club and started writing for our newsletter, my topics were the landforms in our area. I wanted to understand their origins, and I began by searching online.

Right away, I found a wonderful resource that I use to this day: The Geological Evolution of Virginia and the Mid-Atlantic Region. Created in 1999–2000, the Website is based on the work of Lynn S. Fichter, with help from Steve J. Baedke. It is sponsored by James Madison University's College of Science and Mathematics.

Intended for geology students, the site is a treasure trove of information in short, easily readable formats that even a nonexpert like me can understand. It tells the geological story of our area over the last 1.2 billion years, from the mountain-building event called the Grenville Orogeny to the rifting event that created today's Atlantic Ocean—and, during the ensuing tectonic calm, the ongoing gentle uplift known as Rejuvenation, which has raised today's Blue Ridge Mountains and other landforms into growing relief.

You can read the story at three different levels of detail. The one-page and two-page summaries are in tabular form, relating the sequence of major geological events in our area to the resulting landforms and rock formations, along with brief narratives.

But the history I find most useful constitutes 16 separate Webpages. Each page is devoted to a major geological event, such as the Alleghanian Orogeny beginning about 320 million years ago or the Atlantic rifting event beginning about 230 million years ago.

Each page has a graphic cross-section that lets you visualize the event as it occurred (fig. 1). You also get a detailed narrative explaining the event, including links to related concepts and phenomena, such as an "overturned anticline" or the Wilson Cycle.

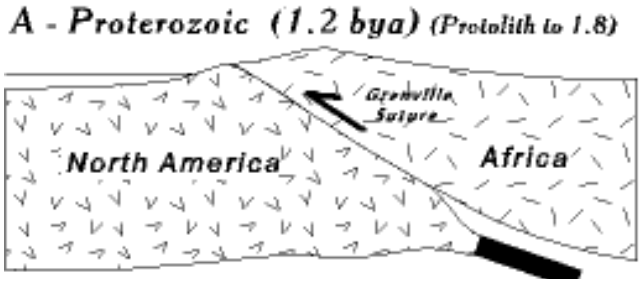


Figure 1—*The Website's 16-page geological history of our area begins with a cross-section showing the collision between proto-Africa and proto-North America about 1.2 billion years ago. The collision formed the Grenville Mountains, remnants of which are the oldest rocks in our area and the core of today's Blue Ridge Province.*

In addition to the geological histories of our area, the site contains other useful information in nested Webpages with more detail as you drill down. A section on theoretical models lets you explore such topics as plate tectonics and rifting models. And a "Descriptive Record of Virginia Geology" explains the physiographic provinces, rock units, subsurface geology, and other geologic features unique to our area.

So if you're interested in finding out more about the geology of our area, there's no better place to start than here!

Safety Matters

Let the Chips Fall Where They May

by Ellery Borow, AFMS Safety Chair

Editor's note: *The article is adapted from* A.F.M.S. Newsletter *(September 2016), p. 3.*

Yes, letting the chips fall where they may is usually about all we can do. When it comes to our hobby, however, we should exercise what I call chip control.

Most lapidary work creates large and small chips. Faceting, cabochon and sphere making, slab and trim sawing, and even some carving usually involve using water, treated water, or oil. Wet work captures the dust and small chips, which fall into the pan instead

of entering the air we breathe. Working wet is a form of chip control.

Some lapidary operations, notably carving, are done dry, with dust and small chips diverted using some kind of fan, hood, and ductwork. This too is a form of chip control.

Many activities in our hobby produce large chips, for example when a rock pick strikes a rock, when a sledgehammer lands on a chisel, when a rock is tossed aside and hits another rock, and even when a bucket of rocks is upended. Chips are also produced by seldom noted processes. For example, at shows I have noticed demonstrations of geode cracking using chain and cast iron pipe cutters to crack the geodes. I have seen hydraulic- and screw-type matrix/specimen trimmers produce chips. Pretty much every operation that alters, separates, or plays with the form of a hard rock produces chips.

How do we control chips, especially during those large-chip-producing procedures?

For one thing, we should protect ourselves with proper safety gear such as gloves, long pants, shirtsleeves, and eye protection.

Now, personal protective equipment is all well and good, but what about the other folks near the chip-producing activity? We can protect them from flying chips by positioning ourselves between them and the chip-producing activity. We can also use collecting buckets, screens, or other barriers to control the flight of chips.

If blocking the flying chips is impossible, we can suggest that folks nearby wear their own personal protective equipment. If they are our own kids, we can insist on it!

Sometimes, we can divert flying chips by carefully using our gloved hand. Even fabric draped over the chip-producing area can be effective for chip control. On occasion, it may even be possible to move the chip-producing activity to a secluded area. It may sometimes be prudent to hold off any major chip production until people in the area have left.

Rockhounds are creative. As respectful rockhounds, we should mind where our chips fall. After all, we certainly want to be good, considerate, and thoughtful rockhounds.

Be safe, think safety, because your safety matters!

EFMLS News

The 2017 AFMS Convention

by Jim Brace-Thompson, 2017 Show Publicity Chair

Editor's note: *The article is adapted from* EFMLS News *(January 2017), p. 5.*

Members of the Ventura Gem and Mineral Society are honored to invite rockhounds from across America to our hometown of Ventura, CA, to participate in the 2017 National AFMS–CFMS Show and Convention taking place on June 9–11.

At the 2016 California Federation Fall Directors Meeting, we performed a "Surfin' USA" skit to kick off show promotions. We also distributed packets filled with info about the show and about Ventura—how to get here, hotels and RV parks, basic show info, and things to do and see beyond the show while on the southern California coast. Rockhounds in all seven regional federations can get this info and more!

To get the Advance Registration Form, competitive and noncompetitive Exhibitor Application Forms, and everything else that was included in the packet, please go to our Show Website. You can also contact VGMS directly at 805-312-VGMS (8467) or at mailto:info@vgms.org.

The national convention comes but once every 7 years to California. Here's an opportunity to compete at the national level with an exhibit, to meet fellow rockhounds from all across the USA, and—in general—to have fun in the California sun! See you in June!

The First Americans: From Whence?

Archeologists used to have a tidy story to explain the earliest peopling of the Americas: During the last Ice Age, when sea levels were much lower, bands carrying spears with large "Clovis" points walked from East Asia over the Bering land bridge into Alaska. But the story is not so simple. The once-dominant "Clovis First Hypothesis" has been overturned in recent years. *Read the story*.

Save the dates!

Field Trip Opportunities

Northern Virginia Community College *Geology Field Trips*

NOVA's Annandale campus offers 1-day weekend courses related to our hobby. You can get more information at the Field Studies in Geology—GOL 135 Website.

Paleozoic Geology of Virginia and West Virginia. One-day field trip via college van on Saturday, April 1, 7 a.m. to 9 p.m. This field trip will let you explore the late Silurian and Devonian geology of western Virginia and West Virginia, considering ancient depositional settings (tropical marine reefs, lagoons, shelves, deep basins, and terrestrial flood plains) and fossils, as well as later deformation (faulting and folding) associated with the Valley and Ridge Province.

Cretaceous Geology of Maryland and Fossil Hunt. One-day field trip starting at 10 a.m. on Sunday, April 23. Well-known dinosaur expert and paleontologist Dr. Peter M. Kranz will lead this fun outdoor expedition to nearby fossil sites, where you can discover many exciting fossils to take home.

Geology of Great Falls Park, Virginia. One-day field trip on Saturday, June 3 (rain date: Sunday, June 4), with a posttrip meeting on Saturday, June 10. Study the modern and ancient forces that created Great Falls National Park, including some easy to moderate hiking. Meet in front of the main Bisdorf entrance on campus at 9:00 a.m., returning by 6:00 p.m.

Audubon Naturalist Society

The ANS offers classes and nature programs, including 1-day field trips. You can get more information and register at the ANS Website.

Geology of Seneca Creek, Maryland. Four-hour field trip on Saturday, April 8 (10 a.m. to 2 p.m.), led by Joe Marx. The cost is $34 for nonmembers. The location is Seneca Creek State Park in central Montgomery County. Dramatic rock outcrops tell the story of an ancient ocean that was consumed during the formation of Pangaea. We will hike from Darnestown Road to Black Rock Mill and then back, for a total of around 3 miles. Our geology hikes move at a faster pace than our usual naturalist's shuffle.

Bench Tip: Dental Tools

Brad Smith

A ready source of free tools is your local dentist. Dental picks can be reworked into wax tools or straightened and sharpened to make a stylus for marking and layout. The steel in these tools is high quality, and the handles are designed for comfort.

A special note, however: If you want to modify the shape of the tool, don't try to just bend it with pliers. Working this alloy of steel while it's cold will cause it to snap. Changing its shape can only be done when it's hot. I work it like a blacksmith. Prop your torch up on the bench so that you can use both hands for the work. Have a hammer and bench block ready. Heat the tip red hot, and hammer it straight or bend it with pliers.

And don't forget to ask your dentist for some of the cutting burs they throw out. These are useful for a variety of things. It's best to call a week or two before your visit and ask the dentist or hygienist to put some of these tools aside for you. It's good practice also to ask that they run them through the sterilizer for you. If that's not possible, pop them in an oven at around 250 °F.

See Brad's jewelry books at amazon.com/author/bradfordsmith

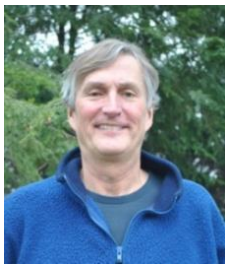
GeoWord of the Day

(from the American Geoscience Institute)

marcasite

(1) A term used in the gemstone trade to designate one of minerals with a metallic luster (esp. crystallized pyrite, as used in jewelry) and also polished steel and white metal. (2) The orthorhombic mineral iron disulfide (pyrite, FeS_2).

(from the *Glossary of Geology*, 5th edition, revised)



Editor's Corner

Fred Schaefermeyer Slogan

by Hutch Brown

When I became editor of our newsletter in January 2013, the newsletter masthead included the black-and-white line drawing shown below. Notice the slogan: "Crystals are the flowers of the Mineral Kingdom."

That same line drawing first appeared in the November 1974 issue of our newsletter, but it didn't include the slogan. The slogan made its debut in the January 1983 issue, coinciding with the transition to a new editor, Fred Schaefermeyer. Fred still used a typewriter, and he typed the slogan directly beneath the masthead.

The slogan appeared without comment, so I have no idea where it came from or why. In 1987, however, with the transition to another editor (Nancy Wiser), the slogan disappeared. Could it have somehow belonged to Fred?

Sometime after 1995, the slogan reappeared. In February 2008, the newsletter first appeared in color for posting online and distributing by email, with the line drawing exactly as shown above, including the Fred Schaefermeyer slogan.

In late 2013 or early 2014, someone from our club (I can't remember who) offered to redo the line drawing by adding a bit of color. Whoever it was (and thank you!) sent me the version we now use on the cover, with blue crystals—and without the slogan.

I never noticed that the slogan was gone, but nobody seems to have missed it. At least, no one ever complained.

That line drawing, by the way, is shopworn and out of date (see the February 2017 issue, page 7). Our club is having a contest to pick a design for a new name tag (see President Bob Cooke's article on page 5). We need a new masthead design for the newsletter as well, but the first priority is name tag design.

Save the Dates!

Annual Atlantic Micromounters' Conference Coming Up

by Kathy Hrechka

The Micromineralogists of the National Capital Area, Inc., are holding our 44th Annual Atlantic Micromounters' Conference from March 31 to April 1. The event coincides with the Golden Anniversary of our club. Come enjoy mineral dealers, a silent auction, a micromineral auction, mineral giveaways, and more!

Our featured speaker is Dr. Michael A. Wise (pictured), a geologist at the Smithsonian's National Museum of Natural History. Mike has been studying pegmatites around the world for the past 30 years. To help understand how pegmatites form and evolve, he focuses on the chemistry of rare minerals. Geologists use the same rare minerals to help locate potential new deposits of economic significance.

Mike has studied pegmatites in California, Colorado, Nevada, New England, North Carolina, and Virginia. In addition, he has visited sites with pegmatites in Brazil, Canada, the Czech Republic, Italy, Madagascar, and Namibia.

Mike helps to manage the Smithsonian's gem and mineral collections. He is also very active in the museum's education and outreach. He received his Ph.D. from the University of Manitoba in 1987.

Mike will give two talks on his research and one on the Smithsonian's micromount collection. In addition, Scott Duresky will give a talk at 7 p.m. on Saturday under the title, "Newly-Identified Members of the Microlite Group from the Historic Rutherford Mine Pegmatite at Amelia Courthouse, Virginia."

The conference will be at the SpringHill Suites by Marriott in Alexandria, VA. The $30 registration fee includes the four lectures; a Friday evening coffee/tea social with light appetizers; and a continental breakfast on Saturday, along with a lunch of deli sandwiches, side dishes, beverages, and dessert. For more information and registration materials, please click here.

The Discovery of Fluorine

by Andrew A. Sicree

Editor's note: *The piece is adapted from* West Seattle Petroglyphs *(newsletter of the West Seattle Rock Club, Seattle, WA), January 2014, pp. 6–7. It originally appeared in* Rocky Trails, *December 2013.*

Fluorine is a marvelously dangerous element. It is so dangerous that several of the early scientists who experimented with it were blinded or killed (they are sometime referred to as the "fluorine martyrs").

Fluorine is the most strongly reactive element. In the mineralogical world, the most common fluorine minerals are fluorite, CaF_2; cryolite, Na_3AlF_6; and fluorapatite, $Ca_5(PO_4)_3F$.

In 1670, Heinrich Schwanhard, a German glassworker, treated fluorite with a strong acid and observed wisps of vapor rising from the solution. As he bent down to examine the fluorite more closely, the vapor clouded his eyeglasses. Assuming the vapor had condensed on his glasses, Schwanhard took them off to wipe them clear. He found, however, that the vapor had actually attacked the glass lenses, etching their surfaces.

This was quite remarkable because very few chemicals will react with glass. By reacting fluorite with strong acids, Schwanhard was thus the first to generate hydrofluoric acid. He kept this process proprietary and used it to create a successful glass-etching business.

Eventually, word of the process got out, and scientists realized that hydrofluoric acid contained a new element. Carl Wilhelm Scheele (scheelite) and other scientists such as Joseph Louis Gay-Lussac (gaylussite), Caroline Menard, Humphry Davy, Antoine Lavoisier, and Louis Thenard (thenardite) experimented with hydrofluoric acid. They and others failed to isolate elemental fluorine.

Henri Moissan (moissanite) finally succeeded in isolating fluorine in 1886 by electrolysis of hydrofluoric acid and potassium hydrogen fluoride, an accomplishment that earned him the 1906 Nobel Prize for chemistry.

Editor's addendum: Fluoride, an anion of fluorine (F^-), is a harmless, tasteless addition to drinking water to help stop tooth decay. It is *not* toxic!

Fluorite crystal showing cubic and octahedral faces, set upon a micaceous matrix.
Source: Wikipedia; photo: Carles Millan.

Humor

Attack of the O'Hooligans

Editor's note: *The story is adapted from "No Sale: Not Always Right," a Website about incidents that defy the maxim that the customer is always right.*

I work in retail jewelry, and on St. Patrick's Day an irate customer approached me in the store.

Customer: "Excuse me, are you the manager?"

Me: "Yes. How can I help you?"

Customer: "I want to complain about your employee in the jewelry department. She's a hooligan!"

Me: "Well, what did she do?"

Customer: "Her hair is green!"

Me: "Ma'am, that's just for St. Patrick's Day."

Customer: "I don't care! It's unprofessional and rebellious! It probably means she's in a gang!"

Me: "Very well. I'll talk with her."

The associate and I have a good laugh over it. She comes in the next day with her ordinary brown hair. The customer happens to come in, too.

Customer: "Oh, your hair is brown! I'm so glad I could help you get away from those hooligans!"

The Rocks Beneath Our Feet

Theodore Roosevelt Island: The Sediments

by Hutch Brown

Editor's note: *This is the third in a three-part series on the geology of Theodore Roosevelt Island. You can find the first part, on the island's bedrock, in the November 2016 issue of the newsletter; and the second part, on the river, in the February 2017 issue.*

Theodore Roosevelt Island is known for its spectacular wetlands. The island's entire western side contains swamp (flooded forest); the swamp partly existed in the late 18th century, when the Georgetown businessman John Mason cultivated the rest of the island (fig. 1, left), then called Analostan.

But Analostan Island was smaller at the time, only about 70 acres in size, whereas the entire national park now covers almost 90 acres. The wetlands have grown to include swampy margins around most of the island as well as a tidal creek and marsh (a flooded grassland) in its southern part (fig. 1, right). A new "Little Island" is also forming on the southern tip.

Why has what we now call Theodore Roosevelt Island grown so much in just 200 years?

The tidal marsh at the southern end of Theodore Roosevelt Island. Source: Fletcher (2011); photo: Rob Fletcher.

Artificial Fill?

A geologic map of Theodore Roosevelt Island shows a tremendous amount of artificial fill (fig. 2). The mapmakers (Fleming and others 1994) described artificial fill as "areas of low-lying land filled for building purposes." In the early 19th century, dredging began in order to clear ship channels in the river, and the sediments were used to "reclaim" marshy riversides that today support buildings and highways on both sides of the Potomac River (fig. 2).

But it is hard to see why anyone after John Mason would have put artificial fill on Analostan Island because no one else ever tried to develop it. Subsequent ephemeral uses included military camps and recreational facilities (boathouses, picnic grounds, shooting ranges, and the like), all long since gone. Today's Theodore Roosevelt Memorial and park structures are relatively small, and they are mostly on the metamorphic Sykesville bedrock, as are the supports for the Theodore Roosevelt Bridge (fig. 2).

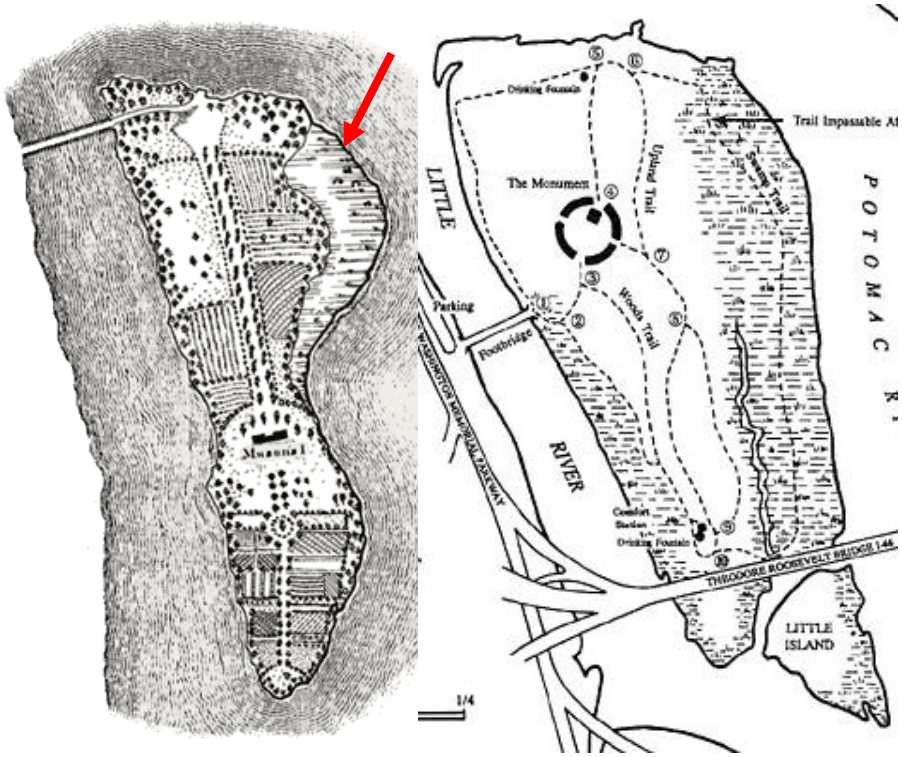


Figure 1—*Analostan Island in about 1810 (left), when it was owned by the businessman John Mason, who farmed the island and had a mansion there. Wetland existed, but only on the island's northeastern side (arrow). Originally only 70 acres in size, the island lacked today's marsh, tidal creek, and additional island at the southern tip (right). Today, the entire area is 88.5 acres in size. Sources: Gunston Hall (n.d.); National Park Service.*

Figure 2—*Map detail showing the geology of Theodore Roosevelt Island and areas nearby. The core of the island (light brown) is a metamorphic sedimentary melange of Cambrian age. Light brown = Sykesville Formation (***Cs***); pink = Laurel Formation; dark brown = artificial fill (***af***); yellow/tan = Quaternary sediments; black = structures. Source: Fleming and others (1994).*

Except for fill added to the northwestern point of the island to support a causeway that once existed there (fig. 1, left), I could find no documentation for artificial fill on the island.

Yet much of the island, including all of the low-lying swamp and marsh (the dark brown in figure 2), comprises sediments. If most of the sediments aren't really artificial fill, then how did they get there?

Erosion and Sedimentation

The answer is not hard to find.

By the mid-17th century, European colonists were moving up the major rivers in our area, pushing native peoples aside and establishing farms and plantations. In the process, they cleared vast areas of native vegetation—forests, grasslands, and open woodlands that held the soils in place.

No longer absorbed by spongy carpets of vegetation, stormwater and snowmelt ran off into streams and rivers, increasing the severity of floods. The runoff eroded entire landscapes, carrying the newly exposed soils downstream.

As settlers moved into the Appalachian Mountains, things got worse. Hardscrabble farms left the scanty soils prone to erosion, and commercial loggers stripped the mountains bare. Dried by the hot summer sun, the woody debris left from logging and land clearing sometimes caught fire, severely burning vast areas and cooking the soils, making them even more prone to erosion. Erosion and gullying caused more flooding and sent more soil pouring downstream.

Where the rivers slowed below the Fall Line, they deposited their sediments, choking many channels and thickening shorelines. By the late 18th century, coastal towns were watching their harbors fill with silt. Dredging of the Potomac River began as early as 1815 so that ships could continue reaching harbors at Alexandria and Georgetown.

In many places, the dredging couldn't keep up. All along the Atlantic seaboard, towns lost their harbors. Examples in our area include Georgetown, DC; Port Tobacco, MD; and Dumfries, VA.

By the turn of the 20th century, people understood the problem and were seeking solutions. The first great conservation movement was born, led by President Theodore Roosevelt, among others.

In response, Congress set aside areas of the public domain as national forests. One purpose, according to the foundational legislation of 1897, was to "secure favorable conditions of water flows." By protecting the headwaters of river systems, the national forests reduced erosion and downstream siltation and flooding, a role they continue to play today.

But the public domain, largely a legacy of the Louisiana Purchase and cessions from Mexico, was all in the West. In 1911, motivated in part by the same concerns about erosion, siltation, and flooding, Congress passed legislation allowing the federal government to establish national forests in the East.

Over the next several decades, the government acquired millions of acres of farmed-out, cut-over, burned-over land in the East, mostly in the Appalachian Mountains. Today, flourishing national forests cover these lands.

But erosion persists on private land, with sediments coming from such sources as agriculture, construction, and urban stormwater runoff. One study has estimated that the Potomac River dumps about 750,000 tons of sediment each year from sources above Chain Bridge into the tidal river and estuary below (Callender and others 1984).

By the late 18th century, when John Mason acquired what is now Theodore Roosevelt Island, siltation was already a problem. One result was the growing swamp on the island's northwestern shoulder (fig. 1, left). The swamp might not have existed at all when the Nacotchtank people still farmed and fished from what they called Analostan Island.

Deposition Dynamics

How exactly did the island silt up?

Rivers and streams follow natural processes of erosion and deposition (fig. 3), which typically occur at bends.

On the outer bend, the current is fastest, so it erodes the river bank (fig. 3). On the inner bend, the current is slowest, and sediments drop out of the water, building a wedge of deposits. That's why you see gravel bars on the inner bends of streams.

As one side of a river erodes, the other side builds up. Gradually, the bend moves, especially in meandering rivers on plains.

Theodore Roosevelt Island splits the Potomac into two channels: Little River (on the Virginia side) and the Georgetown Channel (fig. 4). The latter is where the Potomac makes its first meandering turn onto the Coastal Plain. The 18th-century mapmaker accordingly showed elevations to the left (in the Piedmont), but none to the right (on the Coastal Plain) (fig. 4).

Upstream, flowing from the heights, the Potomac River is relatively straight and narrow and the current still relatively fast. The current shoots past the head of the island into the Georgetown Channel (fig. 4), barely slowing down. Hence there is little "artificial fill" on the northern end of the island (fig. 2).

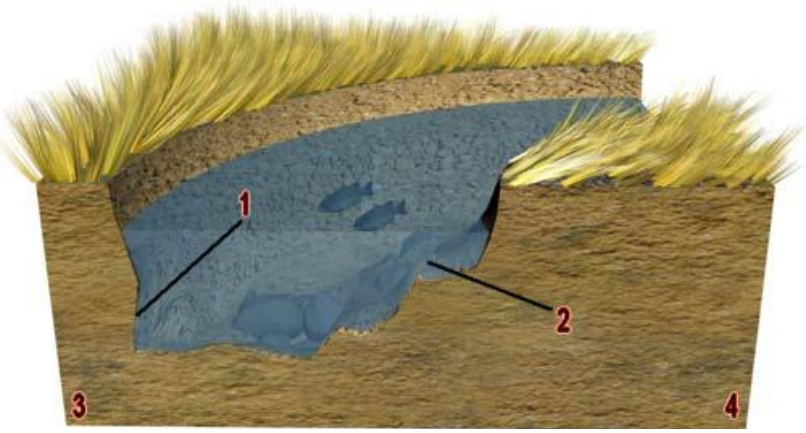


Figure 3—*Dynamics of stream erosion and deposition. The current is fastest on the outer bank of a bend, cutting into it (**1**). The current is slowest on the inner bank, depositing sediments (**2**). The vertical outer bank gradually erodes away (**3**), and deposits build up on the flat inner bank (**4**). Both banks gradually move. Source: One Geology (n.d.).*

Figure 4—*Detail of a map made in 1790 by the surveyor Andrew Ellicott to indicate the boundaries of Washington, DC (the top of the map is to the northeast). The map shows "Mason's Island" in relation to the Potomac River at the time. The main Georgetown Channel made a sharp bend, eroding the Washington side of the river and making deposits on the inside of the bend against the island. A wetland was starting to form (circled). Source: Virginia Places (n.d.).*

Then the Georgetown Channel makes a sharp bend. In 1790, Analostan Island was still fairly close to Georgetown (fig. 4), almost the same distance as to Virginia.

But conditions upstream were worsening floods, with increasing erosion on the Washington side of the river. Georgetown is farther away from the island's core than it once was, subsequent artificial infilling on the Washington side notwithstanding (fig. 2).

The erosion on the outer bend of the Georgetown Channel was naturally matched by deposition on the inner bend. And the inner bend was Analostan Island. By 1790, a wetland was already forming (fig. 4, circled) on what surveyor and mapmaker Andrew Ellicott called Mason's Island.

Just downstream from Georgetown, the Potomac River widens and slows (fig. 4), depositing sediments all along the island's western side. Here, sediments built up along the river bank, forming natural levees.

Figure 5—*On Theodore Roosevelt Island, looking toward Little River across a margin of swamp. Sediments build up around most of the island, forming natural levees (arrows). In wet weather, ground water behind the levees rises to flood growing swamps. Photo: Hutch Brown.*

Behind the levees, ground water rose to flood areas of swampland, especially during winter and spring. The process is still going on today (fig. 5).

The deposits have gradually formed the extensive swamp and marsh that today make up the eastern part of Theodore Roosevelt Island (fig. 2). As the extended island further slows the river's current in its wake, another island is forming from sediments deposited at the lower tip of the main island (fig. 2).

Little River

On the Virginia side of the island, Little River became a sleepy afterthought.

In the 18th century, when the river still flowed vigorously on both sides of the rocky core of the island, Little River was navigable for ships. Pilots could take either channel, depending on conditions.

But as the river waters filled with sediments from erosion upstream, Little River lost out. For all practical purposes, Little River became a "second inner bend" of the Georgetown Channel (fig. 4), and its slower flows caused it to fill in. Nautical charts today show a depth in the channel of only 1 to 4 feet, as opposed to 20 to 30 feet in the Georgetown Channel.

By 1807, the channel was shallow enough for John Mason to build a causeway from Virginia to the northern tip of his island (fig. 1). Little River became a stagnant backwater until the 1870s, when the causeway fell into disrepair and finally washed away.

Although the channel returned, the current remained lazy, a backwash from the Potomac River's mainstream flow into the Georgetown Channel. Nevertheless, floodwaters in Little River remain swift enough on its outer bend—the Virginia side of the channel—to require a line of boulders (what engineers call riprap) to stop riverbank erosion.

The inner bend of Little River is along Theodore Roosevelt Island. The river contains plenty of sediments, so swampy margins have formed around the island's western as well as its eastern side (figs. 2, 5).

Landscape of Paradox

Theodore Roosevelt Island is something of a paradox.

At the turn of the 19th century, John Mason and his family, influenced by Romantic-era ideals, made the island into a cultivated place of genteel pleasure and aesthetic enjoyment of scenery staged to look bucolic, in accordance with the Romantic imagination. The contemporary map in figure 1 portrays a carefully sculpted landscape.

Today, the island is a monument to one of the leaders of America's conservation movement, President Theodore Roosevelt. It is managed as a national park for the preservation of nature and for public enjoyment and learning in the Great Outdoors.

Yet the island has never been pristine, not in thousands of years of human occupation and use. Today, nonnative plants abound, some of them invasive—

English ivy on Theodore Roosevelt Island, where it threatens to strangle a tree. Such nonnative vegetation reflects human impacts, belying the park's "pristine" aura—as do the sediments that make up much of the island. Photo: Hutch Brown.

some dating from past attempts to cultivate the land. English ivy alone is such a threat to the island's native vegetation that the National Park Service, in violation of its usual hands-off policy of benign neglect, is actively managing it.

Moreover, the very makeup of the island is, in part, a human artifact. After centuries of landscape and watershed abuse, resulting in degraded rivers washing eroded hillsides toward the sea, most of the island's wetlands are the indirect result of human activity. Accordingly, their designation on geologic maps as "artificial fill" (fig. 2) might not be so very wrong.

Yet Theodore Roosevelt Island, as a national park, is also a symbol of vitality and hope. Ironically, the accreting sediments are a sign of ecological resilience and recovery. Downstream, the Potomac and Chesapeake estuaries are losing wetlands, yet Roosevelt Island has been gaining them.

As a result, the island offers a premier experience of flourishing wetland landscapes in close proximity to upland forest. The swamp alone, especially in the northwestern part of the island, contains some exceptionally large old trees—quite a sight to behold.

So if you haven't been there already, it is well worth a trip!

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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Wetland at the southern end of Theodore Roosevelt Island. A boardwalk affords vistas of the marsh. Photo: National Park Service.

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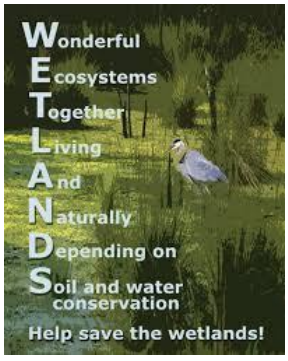

March 2017—Upcoming Events of Interest in Our Area/Region (see details below)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 MSDC mtg, Washington, DC	2	3	4 Show/ conference: Wilmington, DE
5 Show/ conference: Wilmington, DE	6	7	8	9	10	11 Show: Fairless Hills, PA
12 **Daylight savings time begins**	13 GLMS-MC mtg, Rockville, MD	14	15	16	17 **St. Patrick's Day**	18 Show: Gaithersburg, MD
19 Show: Gaithersburg, MD	20 **Spring begins**	21	22 MNCA mtg, Arlington, VA	23	24 Show: Hickory, NC	25 Shows: NC, PA
26 Shows: NC, PA	27 **NVMC mtg, Arlington, VA**	28	29	30	31 **Conference: MNCA, Alexandria, VA**	1 **Conference: MNCA, Alexandria, VA**

Event Details

1: Washington, DC—Monthly meeting; Mineralogical Society of the District of Columbia; 1st Wednesday of the month, 7:45–10; Smithsonian Natural History Museum, Constitution Avenue lobby.

4–5: Wilmington, DE—54th Annual Earth Science Gem and Mineral Show; Delaware Mineralogical Society, Inc.; Arsht Conference Center, 2800 Pennsylvania Ave; Sat 10–5, Sun 11–5; includes conference with several speakers; adults $6, seniors $5, kids 12–16 $4, kids up to 11 free with adult; info: www.delminsociety.org or Elaine Kipp, 410-392-6826, kippekipp@msn.com.

11: Fairless Hills, PA—41st Annual Micromount Symposium; Leidy Micromount Society; Northminster Presbyterian Church, 140 Trenton Rd; info: Don McAlarnen, don.mcalarnen@hpe.com or 610-584-1364.

13: Rockville, MD—Monthly meeting; Gem, Lapidary, and Mineral Society of Montgomery County; 2nd Monday of the month, 7:30–10; Rockville Senior Center, 1150 Carnation Drive.

18–19: Gaithersburg, MD—53rd Annual Show; Gem, Lapidary & Mineral Society of Montgomery County; Montgomery County Fairgrounds, 16 Chestnut St; Sat 10–6, Sun 11–5; ages 12+ $6; kids 11 and younger free.

22: Arlington, VA—Monthly meeting; Micromineralogists of the National Capital Area; 4th Wednesday of the month, 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.

24–26: Hickory, NC—Catawba Valley Gem and Mineral Club Show; Hickory Metro Conv Ctr, 1960 13th Ave Dr SE; Fri 9–6, Sat 9–6, Sun 10–5; $5 admission, kids under 12 free; info: Dean Russell, 828-303-1448 or cvgmcsecretary@aol.com.

25–26: Wysox, PA—48th Annual Che-Hanna Rock & Mineral Club Show; NEW LOCATION: Wysox Vol. Fire Co. Social Hall, 111 Lake Rd; info: Bob, 570-928-9238 or uvbob@epix.net.

25–26: Chambersburg, PA—39th Annual Show; Franklin County Rock and Mineral Club; Hamilton Heights Elementary School, 1589 Johnson Rd; Sat 10–5, Sun 10–4; adults $5, children under 12 free; info: Matt Elden, 717-331-0526 or fcrmc1978@gmail.com.

25–26: Plymouth Meeting, PA—Joint show/sale; Philadelphia Mineralogical Society, Delaware Valley Paleontological Society; Lu Temple, 5140 Butler Pike; Sat 10–5, Sun 10–4; adults $5, kids under 12 $1; info: www.philamineralsociety.org.

27: Arlington, VA—Monthly meeting; Northern Virginia Mineral Club; 4th Monday of the month, 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.

31–April 1: Alexandria, VA—44th Annual Atlantic Micromounters' Conference; Micromineralogists of the National Capital Area; SpringHill Suites by Marriott, 6065 Richmond Hwy; Fri 6–9 p.m., Sat 8:30 a.m.–9 p.m.; registration fee $30; info: www.dcmicrominerals.org.

AUCTION BID SLIP

ITEM # _____
DESCRIPTION_____
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Bidders: You need to bid on this item if you want it to be auctioned! Place bid below.
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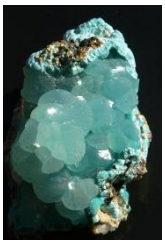
THE NORTHERN VIRGINIA MINERAL CLUB INC

Crystals are the flowers of the Mineral Kingdom



Mineral of the Month: Smithsonite

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http://www.novamineralclub

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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).

You may reprint NVMC materials in this newsletter.

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.*