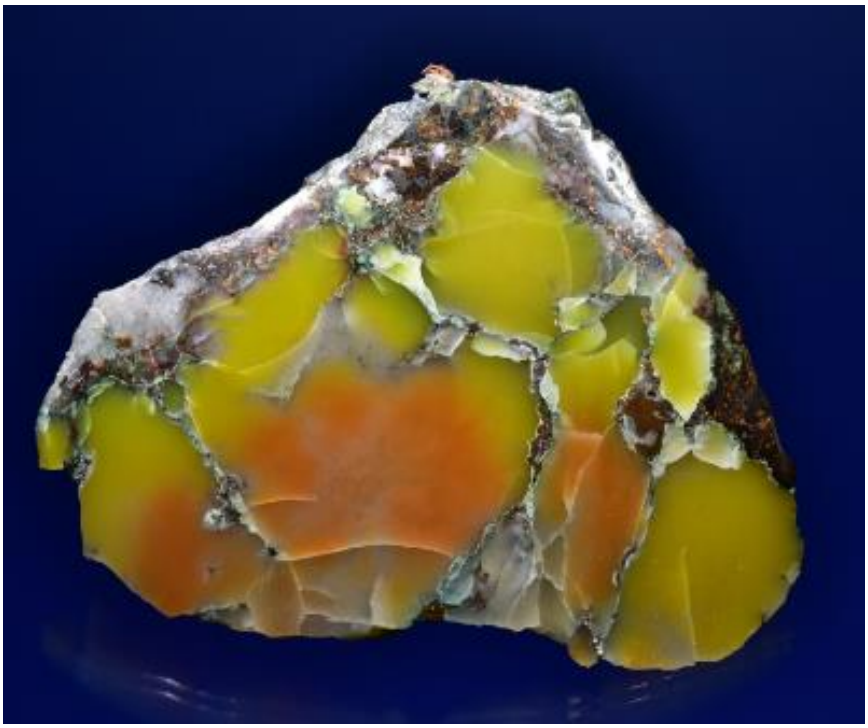
THE NORTHERN VIRGINIA MINERAL CLUB INC

The Mineral Newsletter

Meeting: November 18 Time: 7:45 p.m.

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



Datolite nodule

Quincy Mine, Michigan

Source: Brandes (2019). *Photo: Paul T. Brandes.*

Volume 60, No. 9
November 2019
Explore our website!

November Meeting Program:

Making Sugarloaf Mountain

(details on page 5)

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Deadline for Submissions

November 20

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

Mineral of the Month
Datolite

by Sue Marcus

Datolite, our mineral this month, is not a zeolite, although it often occurs with minerals of the Zeolite Group. It can form lustrous crystals or attractive masses that take a nice polish. And, for collectors like me, it is attainable!

Etymology

Datolite was named in 1806 by Jens Esmark, a Danish-Norwegian geologist. The original material was massive and granular. Esmark based the name on the Greek word δατεῖσθαι ("to divide"). This was reportedly due to the granularity of the material Esmark had, although the correlation between the name and the fact that it was a monomineralic rock (all the same mineral) escapes me.

The original description lacked a complete chemical analysis, which came later that year from Martin Heinrich Klaproth. Klaproth was an apothecary and chemist with expertise in identifying compounds. In addition to teasing out the chemistry of datolite, he discovered uranium, zirconium, and cerium and named titanium and tellurium.

Formation

The Zeolite Group of minerals, along with datolite, forms during hydrothermal or volcanic processes. For example, vugs in basalt can sometimes contain some combination of datolite and zeolites.

Unlike zeolites, datolite contains boron. (Zeolite collectors, let me know if I've missed a boron-bearing zeolite mineral.) Also, zeolites have water (H_2O) in their chemical formulae, whereas datolite does not.

The molecular structure of datolite, aside from the difference in chemistry, is also somewhat different from zeolites. Epimorphs are hollow shells or molds left by a mineral that grew over a mineral that since dissolved away. Datolite forms epimorphs after anhydrite and pseudomorphs after anhydrite, danburite, and probably other minerals as well.

U.S. Localities

The United States has notable datolite localities, particularly in New Jersey, where nice crystals, along with



Northern Virginia Mineral Club members,

Please join our guest speaker, Joe Marx, for dinner at the Olive Garden on November 18 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 Vice President Ti Meredith. Please RSVP to me at ti.meredith@aol.com.



Datolite crystal from Prospect Park, Passaic County, NJ. Photo: Bob Cooke.



Datolite pseudomorph after anhydrite, Prospect Park, Passaic County, NJ. Photo: Bob Cooke.

epimorphs and pesudomorphs were found in the trap-rock quarries of Passaic County and in Hudson and Somerset Counties as well. The Roncari Quarry in Connecticut and the Lane Quarry in Massachusetts produced well-formed, attractive crystals. At all of these locations, datolite occurs with zeolites and often with quartz too.

Michigan Nodules

Michigan is a world-famous source for another form of datolite. On the Upper Peninsula, datolite forms nodules. The most prized nodules, with attractive and colorful patterns, come from the now-closed copper mines and deposits of Keweenaw and Ontonagon Counties. Brandes (2019) describes the texture of these nodules as "porcelainous," reflecting their characteristic luster when cut and polished. Lower quality nodules have a more granular, sugary texture that is not optimal for lapidary work. Although the nodules may be only as small as a pea, some have been recorded as weighing up to 150 pounds.

Brandes (2019) describes the geologic environment of Upper Michigan datolite nodules in detail. They formed in flow tops and fissures of the Precambrian age Portage Lake Volcanics, flood basalts extruded roughly 1.1-plus billion BCE.

To me, it is fun to say the word "amygdule," and that's what some of these nodules are—having formed in vugs in the basalt. When collectors are lucky, the basalt has weathered away, leaving the datolite nodule, or amygdule.

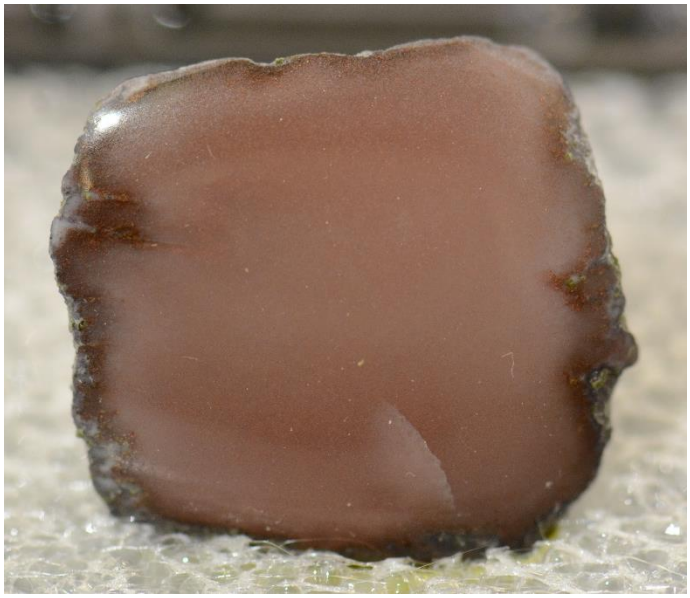
Without impurities, the datolite nodules are white. Iron oxide colors them yellow to pink-red, the favored shades (see the cover). Chalcotrichite causes oranges and redder reds, while other copper minerals can cause green or blueish colors. The very best may even contain a bit of native copper, for which the region was also famous. The nodules have also been discovered by scuba divers in Lake Superior—I hope they were well insulated!

Initially, datolite nodules and crystals were collected underground by miners. The mines are closed, but there is still occasional exploration for copper. Brandes (2019) implies that nodules can still be found by the lucky collector, although mining debris is pretty well picked over. (Remember to get permission to collect on private land.)

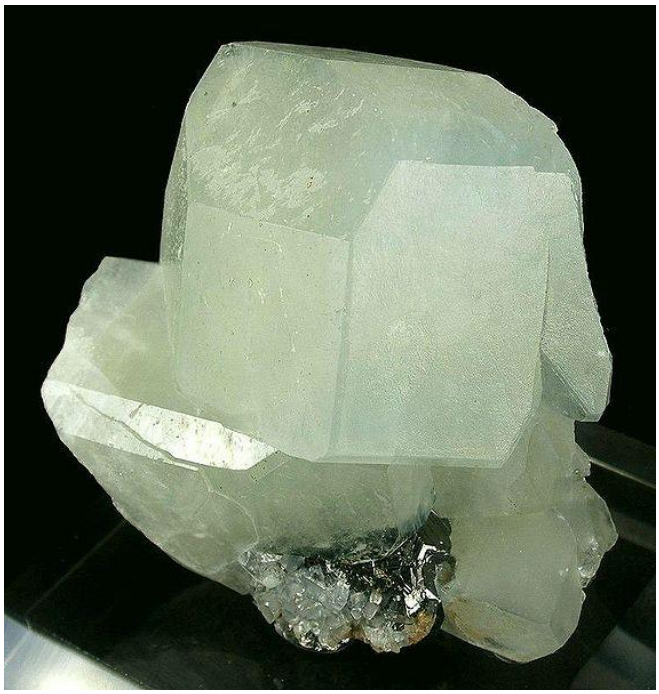
Some Michigan datolite nodules are reported to be fluorescent blue (shortwave), possibly due to traces of europeium. Michigan produced nodules from related geologic formations in places other than those mentioned here, though not to the same extent.

Other Localities

So what's the rest of the world got to offer? Bor Pit, Dal'negorsk, Primorskiy Kray, Russia, is probably the best source for shiny datolite crystals. South Africa's Kalahari Manganese Field, specifically the Wessels



Datolite nodule from the Caledonia Mine, Ontonagon County, MI. Photo: Bob Cooke.



Datolite crystal from Charcas, San Luis Potosí, Mexico (on sphalerite). Source: Wikipedia; photo: Rob Lavinsky.

and N'Chwaning, is another well-known producer of collectible minerals.

Italy has produced some lovely crystalized specimens, although not in the same quantity as other localities. The manganese sometimes colors the datolite pink, making attractive, unusual specimens.

Large crystals associated with danburite come from Charcas, Mexico. Mindat shows some stunning images of pale blue-green crystals with pyrite from Charcas.

Uses

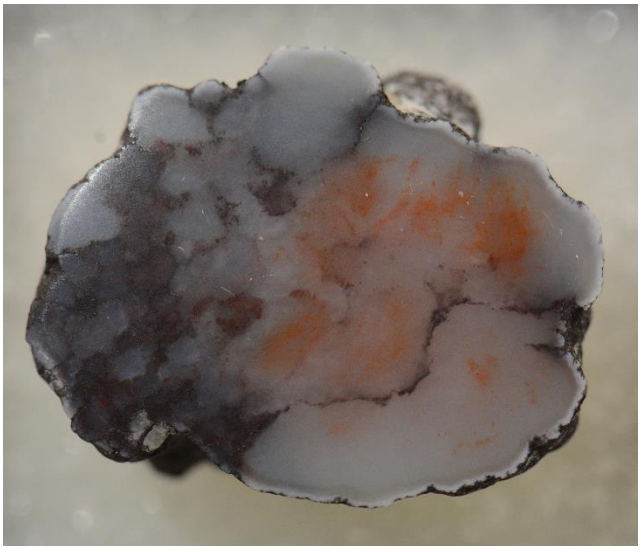
Datolite is not mined for its mineral value but is attractive to collectors. Given its softness in comparison with other lapidary materials, any datolite jewelry has to be worn carefully. Datolite has been faceted, probably mostly as a novelty; the largest faceted stone that I could find, weighing 13.21 carats, came from Massachusetts (now in the Harvard collection).

Technical Details

Chemical formula .....$CaBSiO_4(OH)$
Crystal form.....Monoclinic
Hardness 5–5.5
Density.....2.96–3.00 g/cm3
Color.....*Crystals:* clear, white, yellow, light green, light brown; *Nodules:* white, yellow, pink to very dark pink (usually towards the center)
Streak.....White
Cleavage .....None
Fracture.....Conchoidal, uneven
Luster.....Vitreous

Sources

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Datolite nodule from the Central Mine, Keweenaw County, MI. Photo: Bob Cooke.



Joe Marx

Making Sugarloaf

November 18 Program

Sugarloaf Mountain stands as an isolated promontory straddling the boundary of Montgomery and Frederick Counties near Barnesville, MD. Although the mountain is composed almost entirely of massive white quartzite, the terrain that surrounds it has no quartzite bedrock.

Sugarloaf is decidedly not volcanic in origin, yet the ovioid shape of the quartzite complex strongly resembles a caldera or collapsed volcanic edifice. Sugarloaf has long been a puzzle to geologists, and Mr. Joe Marx will present the most recent geological explanation for the evolution of Sugarloaf Mountain.

Mr. Marx was born in Philadelphia and grew up in Pennsylvania's version of Montgomery County. In 1965, he moved to Washington, DC, to attend Georgetown University, from which he graduated with a degree in chemistry. He went on to Caltech to pursue a doctorate but left with a master's degree in geochemistry after realizing that full-time research was not his calling. He returned to the Washington metropolitan area in 1973 and has lived here ever since.

While searching for a job as a chemist or geologist, Mr. Marx took a temporary position as a computer programmer trainee. He stayed in the field of programming and analysis for more than 25 years.

In 2001, bored with telling computers what to do, he started a second career in geological education. He taught physical and historical geology for 15 years at Northern Virginia Community College, from which he is now retired. He still leads field trips to areas of local geological interest for the college, as well as for the Audubon Naturalist Society (ANS). In addition, he teaches continuing-education courses in geology, chemistry, and forest ecology for ANS.

Mr. Marx and his partner, Bob Kahn, live in Falls Church, just a couple of miles upstream along Long Branch from the nature center. They enjoy traveling, having visited all 50 states and more than 40 foreign countries.

Holiday Party

Please join us for a fun-filled evening on Monday, December 16, at 6:30 p.m. to celebrate the holiday season!

The NVMC and the Micromineralogists of the National Capital Area will provide turkey, ham, and drinks for our holiday party. Please help round out our menu by bringing a side dish. We would appreciate salads, sides, desserts, and more.

Please click on the URL below for the app to sign up if you are coming—and to sign up for a bringing a dish. It really is very easy! Just click and follow the directions!

Thank you. Looking forward to seeing everyone at this wonderful holiday celebration!

Holly Perlick

P.S.: If you would like to participate in the gift exchange, please remember to bring a gift valued between $5 and $20.

https://www.signupgenius.com/go/20F094AADAF2AA46-northern1

President's Collected Thoughts



by Sue Marcus

Show Time! November is the month for *your* club show, so there are lots of articles, mentions, and information about the show in this newsletter. If you haven't signed up to help, now's the time—as you read this, grab a phone and call or find a computer and volunteer; see what you

can do in the various below. Even if you live out of the area or can't come to the show, we can use your help to contact members or to publicize the show. Note the change in our regular meeting date to accommodate show planning

There is life after the show, too. More fun ensues in December with our holiday party (see the announcement above). Like the show, when we all pitch in, we're not spectators, we're part of the group—the *in*-crowd—and in on more of the fun. And, of course, it lightens the load for everyone.

I've trained my family to give me minerals for presents. Have you, or are you still working on that? Or, if specimens or collecting isn't your thing, books or jewelry are other options. Bring family to the show to see if you can point out some possibilities there, or maybe your family is the give-a-list/website type. Or surprise a family member by submitting their name for a drawing!

We have club T-shirts for $15 each (sorry, they only made adult sizes, although small is pretty darn small); they will make excellent presents, too. There's something in our hobby for everyone.

I've had the honor of being the Northern Virginia Mineral Club president this year. Who's next? Look at the table below of those who've served since 2010. You'll see mostly the same familiar names. Wouldn't your name look good there?

Save the date!

Fossil Fest

November 16, 10 a.m.

Smithsonian National Museum of Natural History
Q?rius, ground floor

Learn about tools and techniques for unearthing facts about prehistoric life and more!

Free admission!
Register at: https://bit.ly/2J4F5cl

We hold elections at our December meeting, and we are looking for someone to volunteer to run for president (multiple candidates are welcome). If we have at least one candidate, we can have a quicker meeting and move on to the party faster (otherwise, the food will be cooling along with your heels)! Please contact me to run (or walk) for this or any other officer position (vice-president, secretary, and treasurer).

Thank you for the honor of letting me serve as your president.

Sue

NVMC Hall of Fame: Club Officers, 2010–2019

Year	President	Vice President	Secretary	Treasurer
2019	Sue Marcus	Ti Meredith	David MacLean	Roger Haskins
2018	Bob Cooke	Ti Meredith	David MacLean	Roger Haskins
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



Meeting Minutes
October 28, 2019

David MacLean, Secretary

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

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

The president recognized past presidents Barry Remer and Bob Cooke as well as guests Stephanie and Tom Gillespie, Brynne Mortelaro, Claire Nykolyszyne, and Kat Thorpe.

The two door prize winners were Thomas Kim and Celia Zeibel.

Treasurer Roger Haskins reported that the club has $26,958 in its operating/scholarship fund. The club also has $9,546 in a Treasury bill earning 1.97 percent, for an overall total of $36,504 in club funds. No major bills were outstanding, and the NVMC has adequate funding to pay expenses associated with the upcoming club show and an adequate reserve for emergencies.

Show Chair Tom Taaffe reminded everyone that the 28th Annual Gem, Mineral, and Fossil show cosponsored by the NVMC and George Mason University is coming up on November 23–24. Dewberry Hall in the Johnson Center at GMU will contain the vendor offerings; there will also be side rooms for displays and a kids' activity room. For further details, see Tom's article below on page 10.

Volunteers with cars are needed on Friday, November 22, beginning at 4 p.m. to take show items from storage to the Johnson Center at GMU. Volunteers are also needed for takedown beginning at 4 p.m. on Sunday, November 24.

In addition, we need volunteers to run the show on Saturday and Sunday, especially for the admissions table, for the kids' activity room, and for auctions and door prizes. Show announcement cards were available for members to pass out; page 21 contains a club show flyer.

Donations are needed for the Kids' Mini-mines (see the sidebar on page 9). Any club member can promote the show locally—on a listserve, for example—using the information on the show flyer and announcement card.

President Sue Marcus announced elections for club officers in 2020 coming up at the December club meeting (see page 8). Volunteers are needed to stand for president and vice president. The current secretary and treasurer agreed to stand for re-election.

Sue noted that the club still has a library of old magazines and the like that has not been added to in 10 years. What do we do with it? Put the materials out as part of an auction? If we keep it, someone would have to maintain it. We will discuss the status further at a future meeting.

Sue also announced that NVMC T-shirts are on sale for $15 each. We have none for children, but the small size runs very small.

Sue made a flyer available with information on the sale of cutting material and lapidary equipment at attractive prices.

The display tables included garnets self-collected by the Zeibel family. Jason and Celia Zeibel made samples available and described collecting them in an area north of Saratoga, NY. Some came from the Barton Garnet Mine, a for-profit site with a 30-minute limit for collecting garnets sandwiched in schist. Others came from the nearby Hooper Garnet Mine, an abandoned site on public land that is reachable by hiking through steep terrain.

The Zeibels also self-collected at the Herkimer Diamond Mine, another for-pay site, this one very well picked over. They found the best stone in the parking lot!

Germaine Broussard displayed brachiopods in limestone self-collected in Pennsylvania, along with galena, quartz, and barite. She also gave our speaker a piece of Potomac marble, the same rock that forms the columns in the Capitol building's Statuary Hall.

Germaine also brought magnetized flashlights that club members could use for the walk back to their cars from the nature center in the dark.

The business meeting was followed by a presentation under the title "The Virginia Mineral Project" by Thomas N. Hale.

Nominations for the 2020 Club Officer Elections

by Sue Marcus, President

At the December 16 club meeting, we will elect club officers for 2020. I will be stepping down as club president.

We have many club officers (see the list on the last page of this newsletter), but only four positions are elected each year:

- The ***president*** presides over club meetings and helps to coordinate club activities, ranging from auctions and the annual club show to field trips and the club newsletter.
- The ***vice president*** assists the president and coordinates programs and speakers for the monthly club meetings.
- The ***secretary*** takes minutes at club meetings for the newsletter and summarizes presentations at club meetings, again for the newsletter.
- The ***treasurer*** collects club dues, keeps records of club members, and handles all club financial transactions.

We need volunteers!

President..... Your Name HERE!

Vice President..... Ti Meredith

Secretary..... David MacLean

Treasurer..... Roger Haskins

Self-nominations are nominations! Fresh ideas from newer members and the experience of valued longer term members are all welcome in officer positions for the leadership we will need in the future. Former club officers are willing to mentor new officers as needed. Please send your nomination(s) to me (Sue Marcus) at president@novamineralclub.org.

Club Show Volunteers Needed!

by Sue Marcus, President

Our 28th Annual Gem, Mineral, and Fossil Show is coming up on November 23–24. We need you to volunteer! We will have signup sheets at the November meeting, but I'd greatly appreciate you letting us know before then what you are willing to do.

Please email me, president@novamineralclub.org, to volunteer; just tell me what category of work you are willing to do and what hours you're available.

Setup is on Friday, November 22. If you help with setup, save your receipt for the parking garage and NVMC will reimburse you.

Friday setup, starting at 4 p.m.:

- Load cars at storage shed
- Set up Kids' Mini-mines & kids' rooms
- Set up and cover tables
- Assemble poles with club banner on stage
- Assemble display cases in Dewberry Hall
- Help at the loading dock

Saturday, 9:30 a.m.–6 p.m.:

- Admissions table
- Announcer for door prizes
- Kids' Mini-mines/kids' activity room
- Float/security

Sunday 9:30 a.m.– 4 p.m.:

- Admissions table
- Announcer for door prizes
- Kids' Mini-mines/kids' activity room
- Silent Auction
- Float/security

Sunday takedown, 4 p.m.–?

- Collect mineral show signs on campus (begin at 3:30 p.m.)
- Remove table covers
- Disassemble and wrap display cases
- Disassemble poles with club banner
- Load vehicles
- Drive to storage shed & unload

For details, see the full description of activities by Show Chair Tom Taaffe on page 10 below.

QUIZZES/DONATIONS NEEDED FOR KIDS' MINI-MINES!

For our 28th Annual Gem, Mineral, and Fossil Show coming up on November 23–24, we invite club members to design new kids' mineral quizzes. Quizzes should have 6 to 10 questions and be neither too easy nor too difficult.

We also invite you to donate specimens for the Kids' Mini-mines. Donated specimens should have nice color and/or interesting crystals. Donated specimens should be neither very large nor very small, nor should they be dangerously sharp, toxic, or fragile.

If you can contribute, please contact Tom Taaffe at rockcllctr@gmail.com.

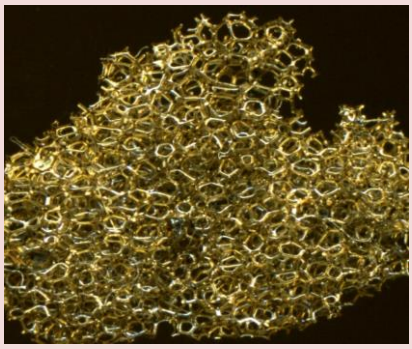
GeoWord of the Day

(from the American Geoscience Institute)

thread-lace scoria

A scoria in which the vesicle walls have burst and are represented only by an extremely delicate three-dimensional network of glass threads. *Syn:* reticulite.

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



Bench Tip

Sheet Wax With Adhesive

Brad Smith

While shopping in the Los Angeles jewelry district for supplies for our class, I found a new product that may interest some of you. Often before casting, I want to increase the thickness of a model by adding a layer of wax on the back side. For instance, models like a leaf or a flower petal do not cast well unless you add a little extra thickness. The problem is trying to apply a coating of wax that's smooth and even.

The new product I found is an easily moldable sheet wax with an adhesive coating. This lets me easily add thickness to a very thin model. With a leaf, just press it onto the wax, trim excess wax around the outer edges, and then gently bend the sandwich to the contour you would like. The wax is available in a number of different thicknesses from about 26 ga to 14 ga.

If interested, my supplier is:

Jewelry Tools & Supplies
412 W. 6th Street #1011
Los Angeles, CA 90014
213 624-8224
jtstech@sbcglobal.net



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



28th Annual Show Coming Up!

November 23–24, 2019

by Tom Taaffe, Show Chair

The NVMC holds its 28th Annual Gem, Mineral, and Fossil Show on November 23 and 24 at George Mason University (GMU).

We have held our annual event at GMU for 21 years. Dr. Julia Nord of GMU's Department of Atmospheric, Oceanic and Earth Sciences has been our facilitator and welcoming host since 1999.

Our show is once again moving two buildings over from The Hub to the Johnson Center. We held a successful show here in 2017, and we expect the Johnson Center to hold all future shows. Dewberry Hall will hold all our dealer booths, and the kids' activity area, exhibits, and demonstrations will be in the adjacent Prefunction Hall and the Gold Room. We expect the floor plan to be much the same as in 2017.

Show volunteers needed!!

We will need a host of club volunteers to help with setup on Friday night, November 22, and to fill various positions over the course of Saturday and Sunday. 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 have so generously helped out at past shows, and we hope that many of you will return to help us again with the 2019 show.

We need volunteers for the tasks and activities summarized below. If you can volunteer or have any questions, please feel free to contact me (Tom Taaffe) at rockcllctr@gmail.com. You are welcome to call or text me at 571-345-5310. You can also volunteer by contacting Bob Cooke at rdotcooke@gmail.com or Sue Marcus at president@novamineralclub.org.

Friday Night Setup (A): Volunteers bring materials from the club's storage unit to the Johnson Center, meeting at the storage unit at about 4 p.m. and delivering supplies to GMU at about 5 p.m. Materials include exhibit cases, electrical cords, table coverings, miscellaneous supplies, and mineral specimens for the auction and the Kids' Mini-mines. 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 will ask permission to use nearby parking lot A on Friday night; otherwise, volunteers will need to park in the closest GMU parking garage (Mason Pond or Shenandoah). We will hopefully have a system worked out so that those unloading not all arrive at the same time. Club volunteers

Annual Gem, Mineral, and Fossil Show
Participating Dealers

Alan's Quality Minerals, Mount Laurel, NJ

Arrowwood Minerals, Dick Ertel, Lexington, VA

Crystal Luxe Lighting, Aldeane Josephs, Bethesda, MD

Ethiopian Gems, Mubarek Allumani, VA

Jonathan Ertman, Rockville, MD

Bob Farrar, Bowie, MD

Jon Feigin, Sewell, NJ

The Garnet Group, Casper Voogt, Sterling, VA

Geosol Imports, Rob Evans, Hawley, PA

Hartstein Fossils, Gene Hartstein, Newark, DE

Dave Hennessey, Woodbridge, VA

Jan Minerals, Jehan Sher, Stafford, 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, Ligonier, PA

Don Soechting, Agates, Charlottesville, VA

Yinan Wang, Fossils, Arlington, VA

Williams Minerals, Keith Williams, Rio, WV

Barry Remer, Reston, VA

Ron Tonucci, Waldorf, MD

as well as student volunteers will be needed to help unload club materials (which we hope to have finished by 6 p.m.).

Starting at 6 p.m., we will need some of the same volunteers to help incoming dealers unload their goods at the three bays on the loading dock and help carry the goods into Dewberry Hall. Dealers will have assigned times (staggered) to prevent a logjam. Most dealers will be scheduled to arrive on Friday night and a few 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, then for exhibits. Volunteers will assemble any exhibit cases and help set up the kids' activity area, arranging the quizzes, Mini-mines, and workstations.

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

Kids' Activities: Volunteers administer quizzes related to minerals and fossils, manage the Kids' Mini-mines, and do what they can to help kids 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 with kids is needed most, are on Saturday from 11 a.m. to 5 p.m. and on 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 on Sunday from 1 to 2 p.m. We currently have two volunteers, and we need two more.

Floaters: These 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 each winner's 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 2-hour to 4-hour shifts 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 4 p.m. We will happily accept whatever a volunteer can do.



Display at the annual club show in November 2015. Photo: Sheryl Sims.

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 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.

Mineral Show Parking: We anticipate that designated parking will be in parking lot A on Saturday and Sunday, just as it was in 2017 and 2018. It will be a shorter and easier walk to the Johnson Center than to The Hub. 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.

Wildacres—Finally!

by Bob Farrar

Editor's note: *The article is adapted from* EFMLS News *(July 2019), p. 4.*

I have been a member of several EFMLS clubs for over 20 years. During that time, I have frequently heard reports from other members about the great experiences that they had at EFMLS workshops held at the Wildacres retreat in Little Switzerland, NC. I had often thought that I should attend one of those workshops and find out for myself if they are as wonderful as my friends indicate, but I never could seem to find the time.

I recently retired, and now I find myself with more time to devote to rock collecting and lapidary work. So I resolved to attend a workshop in May of 2019.

Wildacres is located in the mountains of western North Carolina, which I consider some of the most beautiful land in the country. EFMLS sponsors two sessions each year, in May and September. Wildacres also hosts many workshops sponsored by other non-profit organizations, including crafts, music, writing, and others. For general information on Wildacres, you can visit their website, wildacres.org.

EFMLS workshops offer classes on a wide variety of lapidary and jewelry-making arts, as well as geology. For more details about EFMLS workshops, check out the EFMLS website at http://www.amfed.org/efmls/. Also check out the article about Wildacres by Helen Serras-Herman in the April 2019 issue of *Rock and Gem* magazine.

To say that Wildacres is a secluded spot would be the understatement of the year. The nearest town of any size, Spruce Pine, is about 30 minutes away. There is no television. There is almost no cell phone reception and very limited internet. At night, the loudest noise you are likely to hear is the call of a whippoorwill. If nothing else, it is a great place to unplug, unwind, and recharge.

The facilities exceeded my expectations. The lodges, dining hall, meeting rooms, and classrooms are all very nice. I was expecting something much more rustic. Also exceeding my expectations were the three square meals a day that we were served.



Classes in EFMLS workshops are organized into two 2-day "semesters" with a free day in between. Some classes run for both semesters; others, for only one. All are taught by highly skilled, generous, and patient instructors from EFMLS clubs.

Interspersed with the classes are several lectures by a "Speaker in Residence," who is always a person well known in the field of gems, jewelry, and/or minerals. When I was there, it was noted gemologist and author Renée Newman. Past speakers have included Fred Ward, Mike Wise, Bob Jones, and Helen Serras-Herman.

The free day is particularly fun. Weather permitting, there is a field trip to a local collecting site, which I especially enjoyed. Or you can go to some of the many points of interest in the area, visit local rock shops, or just relax. Later in the afternoon, there is a tailgate show, during which people can sell or trade rocks, jewelry, and related items.

Another particularly fun event is the "Good Stuff Auction" held one evening, during which donated items are sold to help support the EFLMS Wildacres workshop.

On the last night of the workshop, everyone gathers to show off what they have made during the week. Finally, everyone adjourns to the canteen for one last party.

So: is Wildacres all it's cracked up to be? In a word, *yes*! I had a great time, learned a lot, got a few new rocks, and made a lot of new friends.

And, yes, I will be going back.

Scam Targets Mineral Clubs

by Mark Nelson, AFMS BEAC

Editor's note: *The article is adapted from* EFMLS News *(July 2019), p. 10–11.*

There are thieves out there who believe they need the treasury of mineral clubs more than the members do!

These cybercriminals use a technique called "water-holing," taking advantage of websites that club members regularly visit and trust. They mine our websites for terms such as "president" and "treasurer," and they get the corresponding email addresses.

Then they create bogus profiles to try to trick us. They will impersonate a club officer or one of our friends or colleagues—even a celebrity. These profiles look like the real thing, and it's easy to be fooled.

They know that our clubs often have annual shows attended by people we call vendors or dealers. Impersonating someone we know and trust, they will ask us to send money to pay club expenses.

For example, an email from the phony club president to a club officer might look something like this:

Alice, what's the status of the payment to the vendor? Has it been processed yet? Please send $2,715.43 to Able Arnold, P.O. Box 243 in Random City as quickly as possible! I'm tied up on a project at work. Please reply by email when this is done. –James

What can we do to prevent this kind of theft?

First, if the email request is unexpected, look at the email of the sender. Hovering your cursor over the name of the sender may expose the true sender. You might also be able to right-click on the name to expose the actual sender. The attacker will often fake an email address by switching out characters, like lower case "L" switched out with the number "1." Even the slightest change in an email address means the email is going somewhere else!

Second, have policies in place to prevent checks from being issued to cybercriminals:

1. The only club checks are kept by the treasurer.
2. No signed or blank checks are given to anyone "just in case."
3. No checks are created without prior board approval listing the payee, expense category, and exact approved amount.

Third, forward all fraudulent emails of this kind to the U.S. Department of Homeland Security Computer Emergency Readiness Team's Anti-Phishing Working Group at phishing-report@us-cert.gov.

Award-Winning Article

Safety: Be Prepared

by Nancy Roberts

Editor's note: *The article, awarded 1st place for original adult articles by the AFMS in the 2019 Bulletin Editors' Contest, is adapted from* The Nugget *(newsletter of the North Mississippi Gem and Mineral Society), April 2018, pp. 4, 6.*

The Scout motto, "Be Prepared," is something that we Rockhounds should take note of.

If you are an avid collector and attend many club field trips, I recommend that you keep a bin in your vehicle with an assortment of tools, clothes, first aid articles, and so on. You never know what you'll run into, either weatherwise or in terms of site environment.

Here is a list of things that I would suggest. But I am sure you'll think of other things to add, based on your own personal experience.

Clothes: Waterproof boots, gloves, hat, windbreaker or lightweight jacket, heavy socks, a change of clothes, bandanna, beach towel, sweatpants or windpants, sweatshirt, rain poncho, and a small lap blanket.

Tools: Besides the usual rock-collecting equipment like buckets, hammers, chisels, and safety glasses, a pocket knife, screwdriver, rope, kneeling pad or knee pads, walking stick, small containers, cardboard flats, plastic bags for wet clothes or boots, paper towels, hand wipes, handwarmer packets, backpack or fanny pack, and toilet paper.

First Aid: Small first aid kit, extra bandaids, antibiotic ointment, hydrocortisone cream, sterile gauze, adhesive tape, small scissors, tweezers, sunscreen, Ace bandage, water, and kleenex.

This might sound like you need to pack a moving van for a trip, especially if you have a family, but even if you pack just a few extra things, you'll be better prepared for whatever conditions you find.

Remember to layer, layer, layer; you can always take it off, but can't put it on if you don't have it.

As a Girl Scout while growing up, I was taught to always carry a bandanna. It has so many practical uses!

Be prepared! Check online for recommended first aid kit items, if you plan to make up your own kit. For one set of ideas, you can click here.

Field Trip Opportunity

Northern Virginia Community College

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

Geology of Holmes Run Gorge

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



Smithsonian Institution
Mineral Hall—New Acquisitions

The Smithsonian National Museum of Natural History acquired several mineral specimens featured in the Department of Mineral Sciences newsletter for July–September 2019. Shown here are a few.







New acquisitions. **Top:** *Vesuvianite from Canada.* **Bottom, left to right:** *Pentagonite from India; quartz from Colombia; emerald from Hiddenite, NC.*

The Rocks Beneath Our Feet

Geology of the Manassas Quarry, Part 2

by Hutch Brown

The Vulcan Materials Company operates a quarry for crushed rock on the western outskirts of Manassas, VA. The company blasts rock from thick deposits of diabase, which formed from intrusions of magma into fractures in what geologists call the country rock. On June 1, 2019, the quarry hosted a field trip for mineral clubs in our area. It was my first trip to the Manassas quarry, and I decided to research its geology.

The country rock in the area comprises shales and siltstones laid down about 210–230 million years ago in lakebeds and river bottoms. Called Balls Bluff Siltstone, it lies in the western part of the Piedmont physiographic province (fig. 1). Bull Run Mountain to the west demarcates the beginning of the Blue Ridge Province. It is made up of metamorphic rock from the Cambrian Period, more than twice as old as the Manassas quarry rock. East of Manassas lies more metamorphic rock, Cambrian or Ordovician in age. A simplified geologic map of Virginia shows sedimentary rock (fig. 1, green) wedged between much older metamorphic rocks (fig. 1, orange and gray).

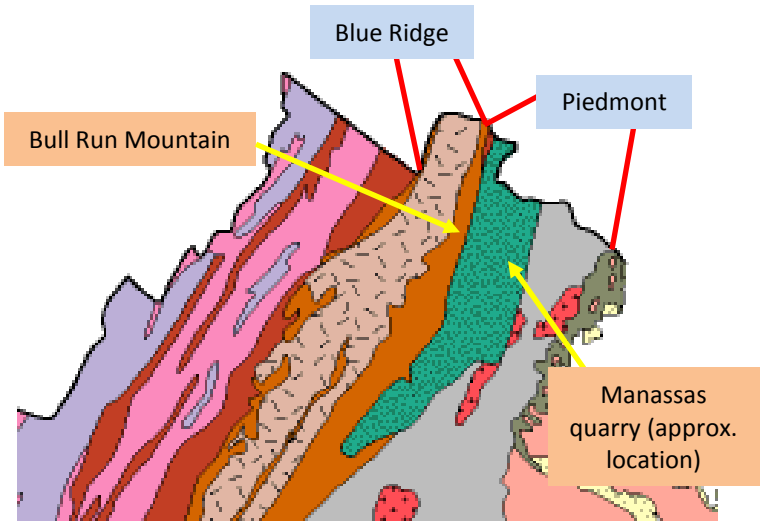


Figure 1—*Detail from a simplified geologic map showing the northern part of Virginia, with two physiographic provinces marked. The Blue Ridge includes pre-Cambrian granitoids (pink/dashes) framed by Cambrian metamorphic rock (orange), including Bull Run Mountain. The Piedmont comprises Cambrian/Ordovician metamorphic rock (gray) with granitic intrusions (red). The Piedmont also encompasses a wedge of Triassic sedimentary rock (green) known as Culpeper Basin. Source: Bailey (1999).*



Manassas quarry—view of quarry walls and a ground water pond in the quarry bottom. Photo: Hutch Brown.

How did younger sedimentary rock end up between metamorphic rock formations that are hundreds of millions of years older?

Culpeper Basin

Bull Run Mountain offers a clue. The Bull Run rock (fig. 1, orange) demarcates what was once the edge of proto-North America. During the early Cambrian Period about 570 million years ago, the supercontinent of Rodinia broke apart as proto-Africa pulled away from proto-North America, forming the Iapetan Ocean, forerunner of the Atlantic. The split took place along the eastern edge of today's Blue Ridge Province.

In the 200 million years that followed, ancient island arcs grafted new lands (what geologists call terranes) onto the continental shelf, forming the bedrock for today's Piedmont and Coastal Plain Provinces. About 320 million years ago, proto-Africa closed the Iapetan Ocean, slamming into proto-North America in a great mountain-building event called the Alleghanian Orogeny. Another supercontinent formed, this one called Pangaea. For millions of years, our area lay deep inside the supercontinent under mountains as high as the Himalayas.

Even the highest mountains weather away in a few tens of millions of years, and supercontinents inevitably break up. By the late Triassic Period about 230 million years ago, the mountains were gone and our area was a flat and featureless plain, much like the Serengeti Plain in East Africa today.

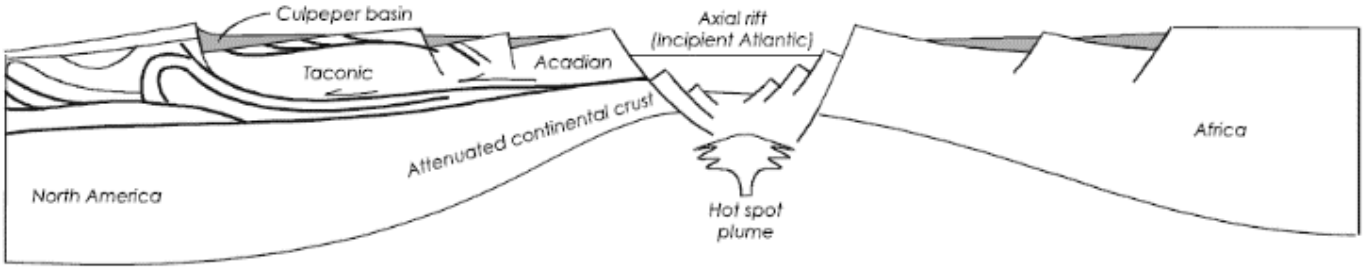


Figure 2—*Triassic rifting in our area beginning about 230 million years ago. A hotspot of magma domed our area, thinning and stretching the overlying rock and reactivating faults, including ancient suture lines between the continental bedrock and the accreted terranes (Taconic and Acadian). Great blocks of rock slid down along the reactivated faults, forming the widening Atlantic Ocean and a series of smaller half basins in our area. Source: Fichter and Baedke (1999).*

As in East Africa today, a hotspot of upwelling magma domed the overlying rock in our area (fig. 2), stretching and thinning the Earth's crust. The doming, stretching, and thinning reactivated ancient faults—weaknesses in the rock—including the suture lines between the continental bedrock and the accreted terranes (fig. 2, Taconic and Acadian).

The hotspot was centered under what became the main rift zone between Africa and North America, what geologists call the axial rift (fig. 2). As the upwelling magma domed and broke through the overlying rock, great slabs of rock dropped down the reactivated faults on both sides of the axial rift. A "graben" took shape, a term derived from the German word for trench. Lava spewed from the center of the graben, which filled with water and continued to spread, forming the Atlantic Ocean (fig. 2).

Parallel to the axial rift were what geologists call half grabens, with faults on one side only. Their remnants are the Triassic basins across our area today (fig. 3, red and pink), including the rift valley at the foot of Bull Run Mountain known as Culpeper Basin.

Culpeper Basin took shape as Atlantic rifting reactivated the ancient Bull Run Fault between the basement rocks of proto-North America and the accreted Taconic terrane of the Piedmont. The Piedmont rocks slid down Bull Run Mountain along the ancient fault line as if on a hinge (figs. 2, 4).

Bull Run Mountain became a "horst," from the German word for eyrie—a huge escarpment looming over the half graben (fig. 4). The rift valley to the east extended from what is now Frederick, MD, to about 40 miles south of Manassas, VA, and as far east in northern Virginia as Reston, Manassas, and the Quantico military base, where the Cambrian and Ordovician rocks of the Piedmont begin. The three localities together form a rough line from northeast to southwest, demarcating the hinge zone for the country rock as it sank down the horst of Bull Run Mountain.

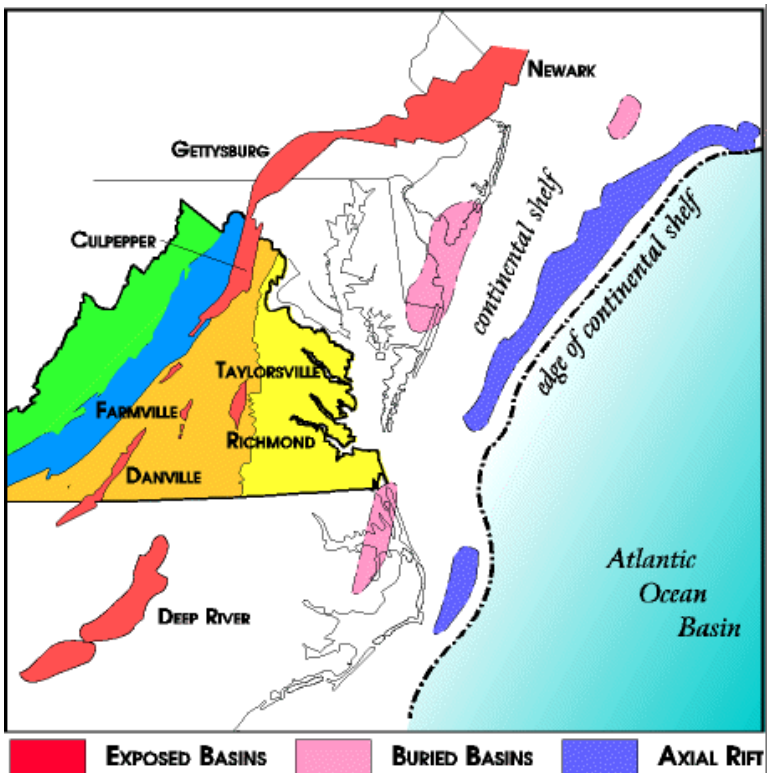


Figure 3—*Triassic basins in our area. As Africa broke away from North America beginning about 230 million years ago, the crust stretched and ruptured along major fault lines in the bedrock, forming a series of rift valleys, along with the axial rift of the spreading Atlantic Ocean (blue). Sediments have since buried the rift valleys of the Coastal Plain (pink), but the basins and their sedimentary rock are exposed in the Piedmont (red). Source: Fichter and Baedke (1999).*

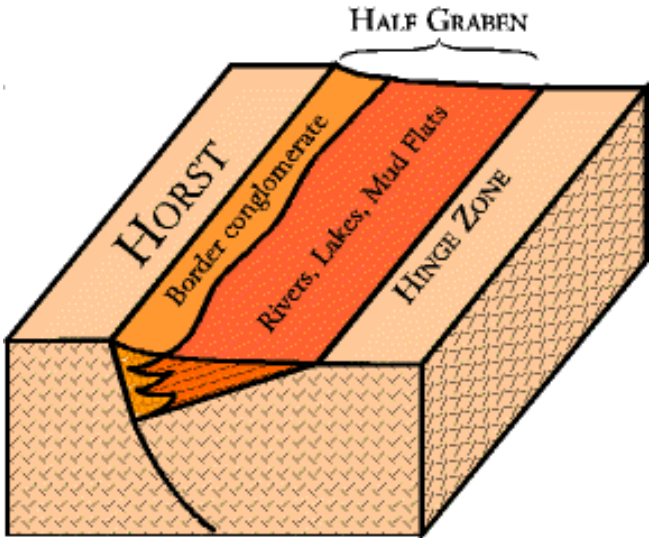


Figure 4—*Schematic drawing of a half graben. The country rock sinks along a reactivated fault line on as if on a hinge, forming an escarpment overlooking a valley. Rivers and lakes take shape in the valley, gradually filling it with sediments from the horst and the hinge zone. Source: Fichter and Baedke (1999).*

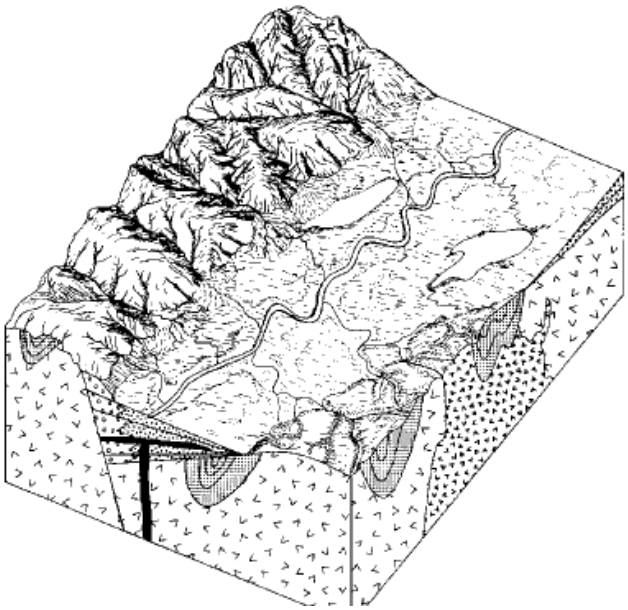


Figure 5—*Schematic drawing of Culpeper Basin about 200 million years ago. The basin is gradually filling with sediments eroded from the horst and carried in by the river that drains the basin. The fault and hinge are visible in the cross-section, as are a dike and sill of intrusive diabase (black bars). The Vs indicate the crystalline country rock before rifting began; the dots on the right indicate igneous plutonic rock (an ancient granitic intrusion) on the hinge. Source: Fichter and Baedke (1999).*

Volcanic activity accompanied the rifting and formation of the half grabens. You can see the same processes going on in East Africa today: the flat and featureless Serengeti Plain; volcanoes such as Mount Kilimanjaro; and the Great Rift Valley, with its huge horsts looming over valleys filled with lakes and rivers, including vast marshes and bottomland forests teeming with African wildlife.

Sedimentary Rock

Even while Culpeper Basin was still forming (which took tens of millions of years), it was already filling in (fig. 5). Gravels, sands, and silts washed from the horst in great alluvial fans, eroding the escarpment. Rivers and lakes formed in the basin, which filled with lacustrine (lakebed) and fluvial (river bottom) sediments even as the bedrock continued to sink along the horst.

Over millions of years, the sediments consolidated into various kinds of sedimentary rock: mudstones, shales, sandstones, conglomerates, and more. The result was sedimentary rock wedges that started in the hinge zone and thickened to the west as the basin continued to sink (fig. 5).

Rifting was associated with rising magma that filled fractures in the overlying rock, becoming dikes and sills of diabase (fig. 5, black bars). The diabase sills (fig. 5, dipping black bar) could be thousands of feet thick. One of them is now exposed by erosion in the area of the Manassas quarry (fig. 6).

Over millions of years, erosion wore away some of the sedimentary rock layers, leaving gaps (what geologists call unconformities) in the geological record—missing wedges of sediment. The effects of rifting, sedimentation, and erosion went on for about 55 million years. When the rate of sedimentation finally exceeded the rates of subsidence and erosion combined, the basin completely filled in.

Some of the formations from the Triassic Period in Culpeper Basin are collectively known as the Culpeper Group, including Balls Bluff Siltstone and Manassas Sandstone. These and other sedimentary rock layers in Culpeper Basin contain fossils that you can find to this day.

Balls Bluff Siltstone

Near the Manassas quarry, the Balls Bluff Siltstone is the country rock for miles around (fig. 6, shades of green). Geologists have identified two members of the Balls Bluff formation: one laid down in lakebeds, the other by rivers and streams.

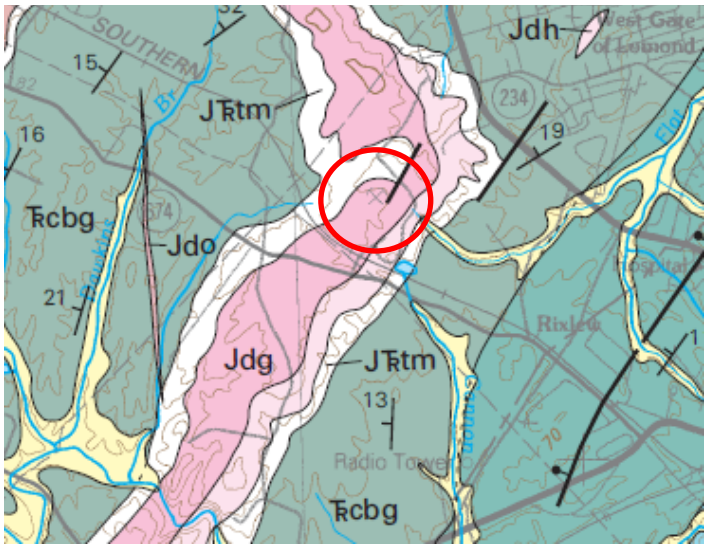


Figure 6—*Detail from a geologic map showing the site of the Manassas quarry (circled, crossed hammers). Green shades = Balls Bluff Siltstone (the lacustrine, olive, is **JTRcbg**); pink shades = diabase (**Jdg/Jdh/Jdo**); white = hornfels (**JTRtm**); buff = alluvium; black bars = faults; thin bars/numbers = strike/dip. The quarry straddles a contact zone between diabase and sedimentary rock. Source: Lyttle and others (2017).*

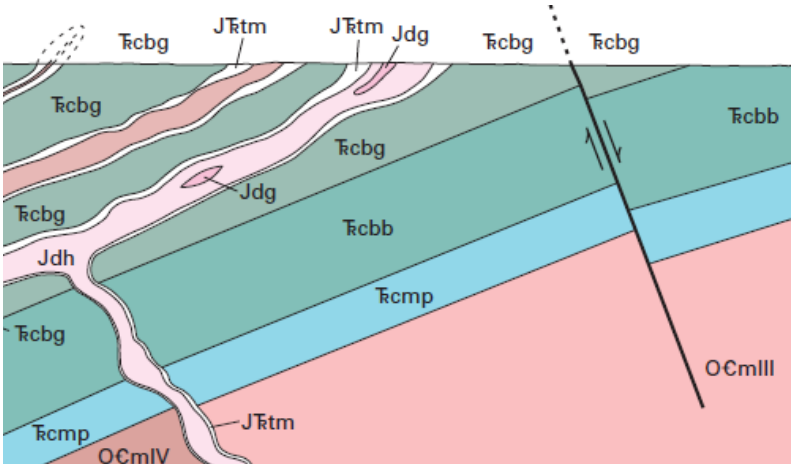


Figure 7—*Detail from a geologic map showing a cross-section of the rock types near the Manassas quarry. The diabase intrusions (**Jdg/Jdh**) form a sill between fractured layers of lacustrine Balls Bluff Siltstone (**JTRcbg**). The lacustrine overlies the fluvial Balls Bluff Siltstone (**JTRcbb**), which in turn overlies Manassas Sandstone (**TRcmp**). The sandstone covers the much older metamorphic basement rock of the Piedmont (**OCmIII/OCmIV**). Source: Lyttle and others (2017).*

The lacustrine Balls Bluff Siltstone appears on geologic maps (figs. 6, 7) as **TRcbg** (**TR** for Triassic, **c** for Culpeper Group, and **b** for Balls Bluff formation). The rock formed from sediments in large shallow lakes of the sort you can find today in the Great Rift Valley in East Africa. The geologic map in figure 6 describes the rock as a "silty to sandy shale" ranging from light gray to black, with ripple marks and fossils in places.

Figure 6 also shows diabase (**Jdg**/**Jdh**/**Jdo**), mainly the outcrop of a sill that intruded into the Balls Bluff Siltstone. The diabase, light to dark gray in color, is "predominantly medium crystalline and porphyritic." (Porphyritic means containing distinct crystals, which rockhounds go to the Manassas quarry to find.) The sill formed in the early Jurassic Period about 190–210 million years ago. On the map, **J** stands for Jurassic and **d** for diabase (figs. 6, 7).

Figure 6 shows a third kind of rock (**JTRcm**), a relatively thin band of hornfels between the diabase and the siltstone. Hornfels is a metamorphic rock formed from the tremendous heat of magma intruding into the country rock, in this case the Balls Bluff Siltstone. Up to 400 feet thick, the rock ranges from dark gray to bluish gray or olive black. Like the diabase, the hornfels is Jurassic (**J**) in age, with the Triassic (**TR**) siltstone as its parent material. (The **tm** stands for "thermally metamorphosed.")

Figure 7 shows the order of various rock types on the slanted ramp formed by the Piedmont basement rock as it slid down the face of Bull Run Mountain on the Bull Run Fault (pink, **OCmIII/IV**).

- Triassic sands accumulated on the sinking phyllitic bedrock, forming the Poolesville Member of Manassas Sandstone (blue, **TRcmp**).
- Overlying the sandstone came sandy silts laid down by rivers and streams to form the fluvial Balls Bluff Siltstone (green, **TRcbb**).
- Next came the finer lakebed silts that formed the lacustrine Balls Bluff Siltstone (olive, **TRcbg**).
- Much later, during the early Jurassic Period, came the rising magma that formed dikes and sills (shades of pink, **Jdg**/**Jdh**) in the overlying Balls Bluff Siltstone.
- At the same time, the siltstones at the margins of the magma intrusions were altered through contact metamorphism into hornfels (white, **JTRtm**).

Confluence of Rock Types

The quarry contains both diabase and hornfels, but I can't tell the difference. I suppose that the dark gray



Figure 8—*Rock (diabase? hornfels?) collected in the Manassas quarry, showing small black crystal faces and a crust of tiny white crystals. Photo: Hutch Brown.*



Figure 9—*Contact zone in the Manassas quarry between diabase and hornfels, photographed by Dr. Callan Bentley. A diagonal line separates the vertically jointed diabase (upper right) from the moderately dipping hornfels (lower left). Source: Bentley (2014).*

crystalline rock I collected during my field trip to the Manassas quarry is diabase (fig. 8); but it could be hornfels, for all I know.

An experienced geologist can tell them apart. Dr. Callan Bentley, professor at Northern Virginia Community College's Annandale campus, has photographed zones of contact in the quarry between the diabase and the hornfels (fig. 9). Presumably, the shales and siltstones of the Balls Bluff sedimentary formation (not metamorphosed) look different from both.

Interestingly, all three main rock types lie in or near the Manassas quarry: sedimentary siltstone and igneous diabase are conjoined by a relatively thin band of metamorphic hornfels (fig. 6).

Not many parts of our area have igneous, metamorphic, *and* sedimentary rock so close together!

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

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2 Show: Oaks, PA
3 Show: Oaks, PA; **daylight savings time ends**	4	5	6 MSDC mtg, Washington, DC	7	8	9
10	11 **Veterans Day**	12	13	14	15	16 Fossil Fest, Smithsonian
17	18 **NVMC mtg, Arlington**	19	20 MNCA mtg, Arlington, VA	21	22 **NVMC/GMU Show setup**	23 **NVMC/GMU Show**
24 **NVMC/ GMU Show**	25	26	27	28 **Thanks-giving Day**	29	30

Event Details

2-3: Oaks, PA—49th Annual Gemarama; Tuscarora Lapidary Society; Sat 10–6; Sun 10–5; Hall D, Greater Philadelphia EXPO Center, 100 Station Avenue; $6 adults, $1 children under 12; Scouts in uniform w/Scoutmaster free; info: www.lapidary.org.

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

10: Richmond, VA—27th Annual Richmond Gem & Mineral Society Rock Sale and Swap; 9–3; Ridge Baptist Church Meeting Hall, 1515 East Ridge Road; info: Andy Dietz, dietziv@yahoo.com.

16: Washington, DC—Fossil Fest; Smithsonian Institution, National Museum of Natural History; Sat 10–4; Q?rius!, ground floor; free; registration requested: https://bit.ly/2J4F5cl.

18: Arlington, VA—Monthly meeting; Northern Virginia Mineral Club; 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.

18: Rockville, MD—Monthly meeting; Gem, Lapidary, and Mineral Society of Montgomery County; 7:30–10; Rockville Senior Center, 1150 Carnation Drive.

20: Arlington, VA—Monthly meeting; Microminerals of the National Capital Area; 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.

23–24: Fairfax, VA—28th Annual Gem, Mineral, and Fossil Show; cosponsors: Northern Virginia Mineral Club & George Mason University's Department of Atmospheric, Oceanic, and Earth Sciences; George Mason University, Dewberry Hall, Johnson Ctr, Rte 123 & Braddock Rd, parking lot A (designated walking route & courtesy shuttle); 20+ dealers, minerals, fossils, gems, crystals, jewelry, and more; Sat 10–6, Sun 10–4; adults $6, seniors $4, teens (13–17) $3, 12 and under free, Scouts in uniform & GMU students w/ID free; info: https://www.novamineralclub.org/events/2019-show.



Presented by The Northern Virginia Mineral Club, Inc. www.novamineralclub.org
Sponsored by the Dept. of Atmospheric, Oceanic and Earth Sciences at GMU

Date: November 23 & 24, 2019

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

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

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 Nottaway River Lane.
Look for our Courtesy Shuttle & Designated Walking Path to Mineral Show

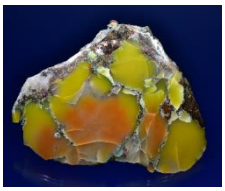
Please help get the word out!
Print out and distribute the flyer!

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

THE NORTHERN VIRGINIA MINERAL CLUB INC
Crystals are the flowers of the Mineral Kingdom

2019 Club Officers

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Mineral of the Month: Datolite

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

The Northern Virginia Mineral Club

Visitors are always welcome at our club meetings!

Please send your newsletter articles to:
hutchbrown41@gmail.com

RENEW YOUR MEMBERSHIP!

SEND YOUR DUES TO:
Roger Haskins, Treasurer, NVMC
4411 Marsala Glen Way, Fairfax, VA 22033-3136

OR

Bring your dues to the next meeting.

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

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

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

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

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