THE NORTHERN VIRGINIA MINERAL CLUB INC

The Mineral Newsletter

Next meeting: February 3 Time: 7:30 p.m.

Dunn Loring Fire Station, 2148 Gallows Road, Dunn Loring, VA



Rosasite

Ojuela Mine, Mapimi, Durango, Mexico

Source: Mindat. *Photo: Rob Lavinsky.*

Volume 65, No. 2
February 2025
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Meeting Program:

Southwest Greenland's Mineral Resources and Political Geology

Details on page 8

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Mineral of the Month
Rosasite

by Sue Marcus

We will explore rosasite as our Mineral of the Month for February. It is an attractive mineral, worth adding to your collection if you don't already have a specimen or two. Rosasite is relatively commonly found in copper deposits. Due to its abundance, we will limit our exploration to the most prolific localities, along with a few others of interest.

Name

In 1906, Domenico Lovisato, an Italian geologist and mathematician, first described the new mineral he called rosasite. He named it for the Rosas Mine in Sardinia, which was the source of the specimens he described.

Geologic Environment

There are several copper carbonate minerals, although only rosasite also contains zinc. Rosasite is a secondary mineral, meaning it forms from the dissolution or replacement of other minerals. It is often associated with calcareous sedimentary rocks (limestone and dolomite) that have been fractured and altered by hydrothermal fluids derived from plutonic rocks somewhere in the vicinity. Those mineral-rich fluids deposited the primary ore minerals.

Some of those primary ores were later altered by meteoric water (from precipitation percolating downward). If there was pyrite in the primary ore, its alteration would release sulfuric acid, which would speed alteration of other metals. Over time, the original ores oxidize into often beautiful secondary ores like rosasite.

Localities

United States. The United States has many copper mines, mostly inactive now, and rosasite has been found in several of them.

New Mexico. The Kelly Mine in Magdalena, Socorro County, NM, is most famous for gorgeous aqua smithsonite specimens (I hope you have one in your collection). The botryoidal spheres of smithsonite aren't quite rivaled by the much smaller rosasite spheres, although rosasite from the Kelly Mine is also an attractive and collectable mineral. Mineral collectors have found rosasite in vugs, with specimens at least 8 centimeters (3 in) long.

The Graphic Mine is also part of the Magdelena Mining District. At the Graphic Mine, rosasite takes several forms, including pseudomorphing cuprite. The octahedral cuprite crystals have been transformed into

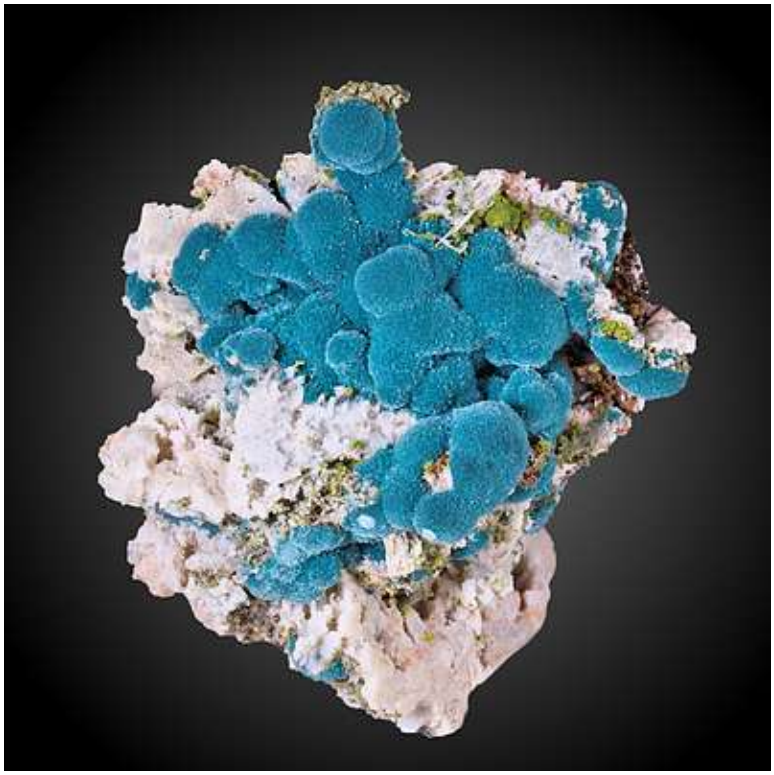


Happy Valentine's Day!

Northern Virginia Mineral Club members,

Our next club meeting will be on **Monday, February 3, 7:30 p.m.**, at our usual meeting place, the Dunn Loring Fire Station. Our speaker will be Thomas Hale, who will give a remote presentation via Zoom; see program details on page 8.

(***Note:*** We will not meet beforehand for dinner.)



Rosasite with duftite, Tsumeb Mine, Tsumeb, Namibia. Source: Mindat; photo: Eugene and Sharon Cisneros.



Rosasite, Kelly Mining District, NM. Source: Mindat; photos: Douglas Merson (top); Patrick Haynes (bottom).

opaque granular (microcrystalline?) rosasite. Graphic Mine rosasite is often darker aqua than specimens from the Kelly Mine and other localities. Some Graphic Mine specimens exhibit varying colors of aqua in the same piece. The largest rosasite specimen shown on Mindat is 12.5 centimeters (4.9 in) in size.

In both the Kelly and Graphic mines, fractured limestone allowed hydrothermal fluids to migrate upward. The fluids picked up copper, zinc, and other elements from deep mineralized zones, depositing them into the altered host limestone as they cooled.

Arizona. Arizona is home to famous copper mines. One of them is the Christmas Mine in Gila County. Botryoidal and individual spheres of rosasite occur with chrysocolla, quartz, and hemimorphite. Specimens range up to about 5 centimeters (2 in) in size for entirely rosasite specimens. Slightly larger specimens include one or more vugs filled with rosasite.

At the Omega Mine in the Santa Rita Mountains of Pima County, AZ, rosasite occurs in specimens up to 9 centimeters (3.5 in) in size. Micromount-size specimens are more common. One collector describes the orbs of rosasite as "brushy tufts." Micromounts provide more detailed views of tufts or individual crystals. Some samples have calcite overgrowing the rosasite.

The 79 Mine is one of the famous old mineral localities in Arizona. Mining for base metals (lead-copper-zinc) commenced in 1879, with silver, gold, and other metals extracted later from the same ore deposit.

The mine produced tens of thousands of mineral specimens, most notably wulfenite, mimetite, hemimorphite, aurichalcite, and smithsonite. Splendid rosasite specimens have come from this mine too. High-quality specimens grace the collections of museums and private collectors around the world.

Rosasite from the 79 Mine is frequently associated with hemimorphite. Interestingly, sometimes the two minerals formed crystals adjacent to one another; on other specimens, colorless hemimorphite grew over rosasite; more rarely, rosasite pseudomorphed hemimorphite. There is even a photo of wulfenite pseudomorphed by rosasite on the Mindat site for the 79 Mine.

Mineralization is related to emplacement of intrusive rock that sent fluids pulsing through the country rocks of limestone and shale. These late Cretaceous to early Tertiary fluids deposited minerals. Although limestone and shale occur in the same suite of older rocks, mineralization preferentially replaced only the carbonaceous shale. This geologic setting is slightly different from most ore deposits where rosasite is found; more commonly, limestone is replaced by the ore and associated mineralization.



Rosasite with hemimorphite, 79 Mine, Gila County, AZ. Source: Mindat; photo: Steve Stuart.



Rosasite, Silver Bill Mine, Costello Mine group, Cochise County, AZ. Source: Mindat; photo: Bruce J. Murphy.

Rosasite and other secondary minerals were concentrated along a post-ore fault. The fault probably formed a conduit for meteoric water (which percolated from the surface) and groundwater that altered the primary ore minerals and redeposited the secondary ones.

The Costelo Mine is a group of workings in the Dragoon Mountains near Gleeson, AZ, that produced many beautiful rosasite specimens. Naco Limestone and part of the Bisbee Formation were altered by fluids related to a nearby quartz monzonite intrusion.

The principal rosasite occurrences were found in the Silver Bill and Mystery Mines. These two mines were connected underground and probably exploited parts of the same orebody. Silver Bill is the most prolific rosasite producer, with many stunning specimens ranging in size from exquisite micromounts to 8.7 centimeters (3.4 in).

Fewer rosasite specimens came from the Mystery Mine, although a photo of one fine 6-centimeter (2.4-in) specimen is posted on Mindat. Rosasite pseudomorphs occurred at the Silver Bill Mine, with at least one specimen exhibiting rosasite after malachite after azurite, meaning that the original azurite was altered to malachite, which was in turn altered to rosasite. The specimen retains some of the appearance of the original azurite crystals. Most rosasite specimens exhibit balls or botryoidal forms, sometimes with an acicular appearance, sometimes with smoother surfaces. When rosasite pseudomorphs another mineral, the texture is granular with a matte luster. Colors vary from palest aqua to deep green (like the color of pseudomalachite).

The Defiance Mine, another part of the Costello mine group, produced a few rosasite micromounts.

Mexico. The Ojuela Mine in Mapimí, Durango, the source of many beautiful mineral specimens, is the most prolific source of rosasite in the world. There were at least 15 levels in the now-closed mine which exploited at least seven orebodies. Ore was mined down to the water table at least 233 meters (700 ft) below ground. Ore production ended in 1932 after 350 years of mine operations. Specimen production continues sporadically, with spectacular pockets occasionally found. These produced the world's best examples of legrandite, adamite, and rosasite.

The Ojuela Limestone hosts the mineral deposit of the same name. Hydrothermal fluids percolated upward, forming vertical deposits (chimneys), and spread out horizontally to form deposits called mantos (after the Spanish word for blanket or mantle). According to Patterson (1931), the localized physical properties of the limestone were more conducive to replacement by the ore-bearing fluids than were other limestone layers.



Rosasite with hemimorphite and plattnerite, Ojuela Mine, Durango, Mexico. Source: Mindat; photo: Gianfranco Ciccolini.

Faulting and folding complicates our understanding of ore deposition at the Ojuela Mine. Some orebodies were formed before faulting occurred, others afterwards. Geologists can determine aspects of the sequence of events by what's called "the law of cross-cutting relationships:" if, for example, a mineral deposit is cut off by a fault, then the fault occurred after the ore was deposited. The same "law" is true when geologists look at rocks and outcrops. We use these clues to determine the sequence of geologic events.

On Mindat, rosasite from the Ojuela Mine takes many forms. There are broad velvety to smooth sculptural blobs, roughly similar to smithsonite from the Kelly Mine in New Mexico. Microscopic balls of rosasite can form from tiny individual crystals gathered into prickly tufts. Later-forming colorless transparent calcite or gypsum (selenite) sometimes grew over crystals or mats of rosasite. These specimens sparkle with clear minerals over the colorful aqua rosasite, creating attractive specimens. Colorless hemimorphite is another associated mineral that provides nice color contrast with rosasite. The colors of rosasite range from pale to dark blue-green or roughly from cyan through teal. Specimens up to 17 centimeters (6.7 in) in size and exquisite microcrystals have been found at the Ojuela Mine.

England and Wales. Small rosasite specimens have been found at the Roughton Gill Mine in Cumbria, England. Botryoidal and acicular rosasite formed uncommonly on specimens up to 4 centimeters (1.6 in) in size. Microphotographs posted on Mindat show interesting concentric patterns on broken stalagtitic and botryoidal rosasite, with some specimens showing darker centers. This could indicate that rosasite replaced an earlier mineral. In Cornwall, a few rare microscopic crystals of rosasite have been reported from two of the former tin mines.

In Wales, images of rosasite micromounts are shown on Mindat, although only one or two images are shown from each of the four separate localities. Rosasite has been reported from additional Welsh localities but seems to be rare.

Italy. Sardinia, part of Italy, is a large island off the west coast of that country. Its varied rock types have engendered many mineral species. Most Sardinian minerals form exquisite microcrystals, appealing to micromounters and mineral photographers. Sardinia is the type locality for more than 15 mineral species, including rosasite.

Many of the Sardinian rosasite localities are areas with many adits, shafts, and other workings. These mining complexes were developed for zinc and lead ores, and rosasite was not abundant or massive enough to be a significant ore mineral.

However, the type locality for rosasite is the Rosas Mine, where collectors may still dig on the dumps, subject to certain rules. A 16-centimeter (6.3-in) specimen from the Tiny-Arenas Mine is dotted with small rosasite balls; it is the largest Sardinian rosasite specimen shown on Mindat. A few rosasite specimens have been found at the Baccu-Locci, Is Murvonis, Mont'Ega, Montevecchio, Sa Marchesa, San Pietro Mines and the Serra de s'Eda Prospect.

Namibia. The Tsumeb Mine is famous for the quality of its many well-crystalized mineral species. It is also known for its great variety of minerals, with estimates ranging from 240 to 489 different species. The mine was also a prolific specimen producer. The variety, quality, and numbers of mineral specimens from Tsumeb helped make it famous.

Geologically, the ore is hosted in dolomite. Alteration of the sulfide ore created the wealth of beautiful minerals for collectors. Specimens of azurite, malachite,



Rosasite, Tsumeb Mine, Tsumeb, Namibia. Source: The Arkenstone; photo: Rob Lavinsky.

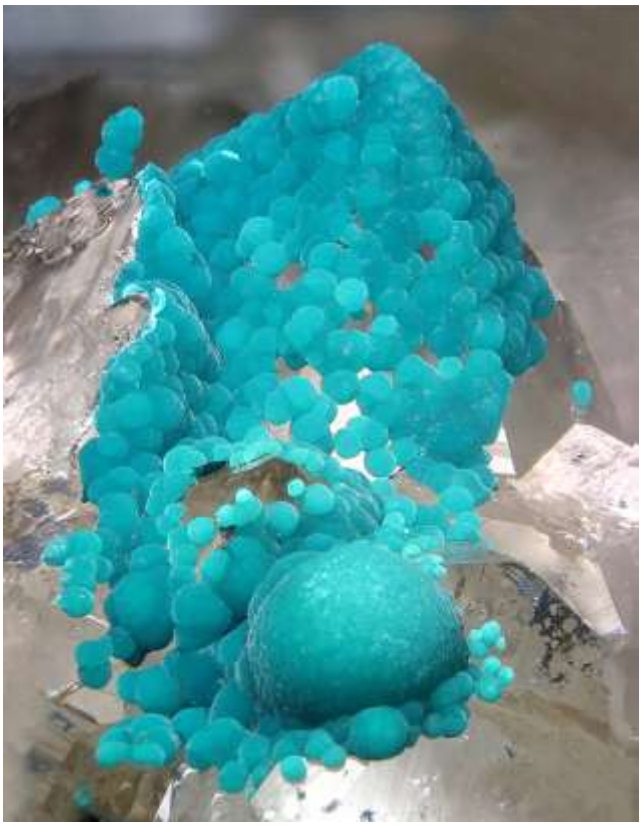
and cerussite were relatively abundant. Rosasite specimens were not as plentiful, but Tsumeb rosasite can be stunning.

Specimens of azurite replaced by malachite, which was then replaced by rosasite are particularly interesting. These are sometimes called double pseudomorphs due to two separate episodes of replacement. Many of these clearly retain the crystal morphology of azurite, with sharp crystal faces. Botryoidal forms of rosasite also occurred at Tsumeb.

Most specimens aren't large, being thumbnail to small miniatures in size. A large sample of rosasite coating cuprite measures 18.5 centimeters (7.3 in). Clear to white calcite and light green duftite are common associated minerals. Colors of rosasite vary from pale aqua to malachite green. Unusual specimens include stalactitic forms consisting of small calcite crystals sprinkled with tiny blue-green rosasite balls.

Chile. The rich copper mines of Chile have not produced much rosasite—or, if they have, the mineral went to the ore crusher. Of the six Chilean rosasite images posted on Mindat, four specimens came from the Dos Adrianas Mine in the Atacama region. Each of the Dos Adrianas Mine pieces is more than 5 centimeters (~2 in) across.

France. At least a dozen lovely rosasite micromounts were found at mines in Occitanie, France, primarily in



Rosasite on quartz, Rohdenhaus Quarry, Rohdenhaus, North Rhine-Westphalia, Germany. Source: Mindat; photo: Harjo Neutkens.

the Les Malines District and in La Cayrolle near Limoux.

Germany. My compliments to the photographers who posted photos of gorgeous German rosasite micromounts on Mindat.

One specimen is 4 centimeters (1.6 in) across. Most specimens came from North Rhine-Westphalia, along with a few from the famous Clara Mine in Baden-Württemberg and a few other minor localities.

The Rohdenhaus Quarry was the source of most specimens. Spherules of tiny aqua rosasite contrast with colorless quartz and coat quartz crystals on some specimens. Devonian limestone hosts copper- and zinc-bearing veins.

The Bastenberg Mine near Ramsbeck also produced a few micromounts, one of which looks like rosasite pseudomorphing native copper. The form of the rosasite mimics the form of arborescent native copper crystals. It is also possible that total replacement hasn't occurred and the rosasite is coating native copper. At

least two large specimens measuring more than 7 centimeters (2.6 in) are posted on Mindat.

Other Countries. Many other countries have large copper deposits, some of which have beautiful secondary copper minerals like malachite. Rosasite specimens are reported from a few of them, although collectors were unlikely to be able to obtain them as of January 2025. We can hope for a future discovery, preferably with enough specimens to bring down prices so that we can all afford them.

For example, hundreds of fine malachite, aurichalcite, and azurite specimens have come from the Democratic Republic of Congo (formerly Zaire), though rosasite is rare there. There are reports of rosasite from large countries like Australia, China, and Russia, but there are no significant rosasite localities in those countries.

Economic Uses

Although copper and zinc can be extracted from it, rosasite is not typically found in sufficient abundance to be a useful ore mineral. It can be processed together with other secondary ores but is not a primary target of economic mineral extraction.

However, rich pockets of rosasite and other mineral specimens have been extracted for sale to collectors at localities like the Ojuela Mine in Mexico.

Gems

Rosasite is too fragile to be a gemstone, but that hasn't stopped people from trying to create jewelry from the stone.

A wire-wrapped specimen of rosasite (that is, a raw mineral specimen wrapped in jeweler's wire for a pendant) and, separately, a cabochon said to be chrysocolla and rosasite were offered by online sellers on January 11, 2025.

I encourage readers to enjoy rosasite as mineral specimens and enjoy other minerals in jewelry.

Prices

On January 11, 2025, rosasite specimens were available online at a price range for every collector. If you wanted to spend $12,000, you could buy a lovely double pseudomorph rosasite after malachite after azurite from Tsumeb displaying the sharp faces of the original azurite crystals on the 6.7-centimeter (2.6-in) specimen. At the other end of the price range, a seller on Etsy was offering 4.4- to 5-centimeter (1.7- to 2-in) specimens from $8 to $17, plus shipping. The locality for the less expensive specimens was the Ojuela Mine in Mexico.

Technical Details

Chemical formula .....$(Cu,Zn)_2(CO_3)(OH)_2$

Crystal form .....Monoclinic

Hardness.....4-4.5

Specific gravity.....4-4.2

Color .....Shades of blue (pale blue, aqua, teal, etc.) to blue-green

Streak .....Light blue, green

Cleavage.....Perfect

Fracture .....Fibrous

Luster .....Silky, vitreous, dull

Acknowledgment

My thanks to my husband, Roger Haskins, who parsed out pertinent economic geology terms like supergene and explained secondary mineralization processes.

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Thomas Hale

Southwest Greenland's Mineral Resources and Political Geology

February 3 Program

Thomas Hale, who recently returned from Greenland and Denmark, will give a Zoom presentation discussing Greenland's mineral resources in the context of its strategic importance in the Arctic. Greenland has become one of the central areas of focus for U.S. Arctic strategy in the incoming Trump administration. With rising interest in the economic and strategic importance of Greenland for the United States comes a growing effort to cut through the rhetoric to better understand the geological, logistical, social, environmental, and political challenges facing Greenland's mining sector.

Greenland is seeking independence from Denmark while also dealing with workforce challenges and post-colonialism in one of the world's regions most affected by climate change. Mr. Hale will begin by giving a broad overview of the primary mineral resources and economic deposits in Southwest Greenland, along with their histories and modern political conflicts. He will focus mostly on his work related to the historic Ivittuut Cryolite Mine and the Ilimaussaq intrusive complex while also briefly covering the Amitsoq graphite deposit and Nalunaq gold mine. He will use photos from his field work to discuss the importance of Greenland's minerals, including its national mineral (tugtupite), Ilimaussaq fluorescents, and the large variety of type-locality minerals located in the region.

Mr. Hale will finish by discussing his dissertation research, which uses the field of political geology to bridge the gap between geological research and modern political analysis. Political geology can help us better understand geopolitical actions on the international stage and how the "subsurface politics" of Greenland, formed over billions of years, have set the stage for modern political and economic conflict.

Mr. Hale will conclude by inviting an open discussion about his presentation, and he will be happy to answer any questions about his research and the broader geopolitical and mineral resource challenges across all of Greenland, not just the southwest.



Tugtupite, Tugtup Agtakorfia, Ilimaussaq complex, Kitaa Province, Greenland. Source: Wikipedia; photo: Géry Parent.

Thomas Hale is a Ph.D. student at the University of Delaware in the Department of Geography and Spatial Sciences, where he focuses on the nexus between the mining industry and national, environmental, and human security—or what he calls the "mineral-security nexus." Mr. Hale applies this concept to the practice of "mineral diplomacy," the use of minerals and related materials to show global communities the importance of mining to achieve shared energy futures.

Mr. Hale received his master's degree from the Elliott School of International Affairs at George Washington University and his bachelor's degree from Virginia Polytechnic and State University (better known as Virginia Tech). His interests span the globe: he has conducted research on Afghanistan, the Democratic Republic of the Congo, and (most recently) the Arctic Circle.

Mr. Hale maintains a working knowledge of the technical applications and extraction of critical minerals while also remaining engaged in the policy and defense communities. He hosts a podcast titled, "A Rock & a Hard Place," where he invites experts to discuss contemporary issues in mining and national defense.

Mr. Hale also founded the first mineral literacy nonprofit in the country, supporting K-12 educators and local industry in engaging communities about the importance of mining in modern society.



President's Message

by Jason Zeibel, President

This year started out cold and snowy in Northern Virginia. I guess that shouldn't be a surprise in winter, but it's been a few years since we had a real snowstorm, so I think many of us have gotten out of the habit of dealing with lots of snow. Certainly, the schools deal with it by not dealing with it, and we had an entire extra week of winter break in my household. That provided a few extra days of respite from the outside world for my girls and a chance to engage in the timeless fun of snowball fights and sledding, followed by a nice mug of hot chocolate with marshmallows.

Now the world is moving quickly again with school and work travel as we get into the swing of the new year. For those of you who enjoy a good snow day, winter may not be done yet. So get out there and enjoy the sting of Old Man Winter before coming in for a nice cup of hot cocoa by the fire.

A public service announcement: February contains Valentine's Day—a Hallmark-exploited reason to think about that special someone (or those someones) in your life. Don't do what I did once and think that a card and some flowers will do. This year, remember to include geologically themed, color-appropriate jewelry! Consider rubies, garnets, rhodolite, spinel, carnelian, red opal, apatite, onyx, or even sunstone. (Just avoid the mercury-containing cinnabar.)

At the January 2025 club meeting, we welcomed our own Casper Voogt to talk about his mineral-collecting adventures around the world (fig. 1). Due to the aforementioned snow, we made the meeting online only—the first challenge we faced in our last-minute pivot to Zoom. I am not sure that we got it completely correct because we only had about a dozen folks join us online. So if you did not get the link in time or if you were simply dealing with the snow, then you can still see Casper's online presentation here.

There were advantages to the Zoom aspect of Casper's talk: it allowed him to turn around and grab specimens from his extensive display cabinets and weave stories about them into his presentation (fig. 1).

Our family decided to completely embrace winter to start 2025. We took a week at New Year's and went to



Figure 1—*Casper Voogt delivering his Zoom presentation on his mineral travels around the world at the January NVMC meeting. All photos: Jason Zeibel.*



Figure 2—*Club President Jason Zeibel and family celebrating New Year's night in Iceland.*

Iceland! The main goal of the trip was to get some good views of the northern lights (aurora borealis) (fig. 2). This year marks the peak of the 11-year solar cycle, which leads to increased sunspots, solar flares, and auroral activity.

We'd been to Iceland before as a family in 2015, but it was summer then and we never saw the aurora because it was never dark. This time we certainly had darkness and, fortunately, clear skies. We were treated to several nights with marvelous auroral displays (fig. 2).

Iceland has some striking, even in-your-face geological activity going on, including during our visit. Iceland is one of the few places on the planet where you can see and touch a spreading tectonic plate boundary. We did both at gorgeous Thingvellir (Þingvellir) National Park in the Silfra Fissure. The fissure, first opened in 1789, continues to spread about 0.7 inch (1.8 cm) per year. It is from a few feet to 300 feet deep and from 10 feet to hundreds of feet wide, but it is continuously changing as it spreads. The spread has created a ravine filled with groundwater from the Langjokull Glacier 37 miles to the north. Water coming through the fissure—pure and crystal clear—has traveled for over 100 years on its way from the glacier to the ocean.



Figure 3—*The Zeibel family on a snorkeling adventure in the Silfra Fissure in Iceland, where you can swim between the Eurasian and North American plates.*

The water temperature is just above freezing (at about 36 °F) year round.

Since Icelanders love exploring every part of their country, they offer both snorkeling and scuba experiences in the Silfra Fissure, and we decided to try it (fig. 3). We donned neoprene dry suits over insulated underlayers and took the plunge. We saw fish and aquatic plants, but the real draw was being able to touch both sides of the fissure, knowing that the rocks on each side are moving away from each other and will one day be thousands of miles apart.

Another place where the active geology of Iceland was on full display was near the Blue Lagoon spa on the Reykjanes Peninsula (fig. 4). This is one of the most volcanically active regions on the planet, with a lava flow on average every few years. With five to six separate volcanic systems, the Reykjanes Volcanic Belt is an extension of the underwater Reykjanes Ridge, part of the Mid-Atlantic Ridge.



Figure 4—*The Zeibel family enjoying the geothermal waters of the Blue Lagoon on Iceland's Reykjanes Peninsula, one of the most volcanically active regions on Earth.*



Figure 5—*The most recent lava flow covered the access road and parking lot for the Blue Lagoon spa.*

Recent volcanic eruptions have made headlines, including the Fagradalsfjall eruptions in 2021-23 and the Sundhnúkur eruptions in 2023-24. The latter threatened both the town of Grindavík and the world-famous Blue Lagoon spa (fig. 4). The current round of Sundhnúkur eruptions has included seven lava flows; the latest, from 20 November to 8 December 2024, covered an area of 3.5 square miles (9.1 km^2) with a volume of 61 million cubic yards (47 million m^3) of lava (source: Wikipedia). The November eruption prompted the evacuation of the Blue Lagoon spa and covered its parking lot with 10-20 feet of new rock.

By Christmas, this round of eruptions was over, and Blue Lagoon staff started rebuilding the road to the spa and a new parking lot (fig. 5). When we arrived in early January, the spa was open again. On the drive in, we detoured around various lava flows as the bulldozers "paved" the new road by smoothing out lava fields.

Our family was able to enjoy several hours in the UNESCO Geopark-certified Blue Lagoon, one of the most unique spa experiences on the planet (fig. 4). Afterwards, I walked over to the newly cooled lava field abutting the brand-new parking lot and did a little self-collecting of what are surely some of the newest rocks on the planet (fig. 6)! We had several other



Figure 6—*Self-collected Icelandic lava from the November-December flow that covered the parking lot of the Blue Lagoon spa.*

geologically themed adventures in Iceland that I may highlight in future columns if there is interest.

Coming up in February for the NVMC is the always-entertaining Thomas Hale giving a talk about another truly unique geological location—Greenland! The world's largest island has been in the news quite a lot lately due to its strategic location and petrochemical resources. Whether the United States will purchase the island from Denmark seems doubtful, but what is certain is that Thomas will give us a wonderful presentation about why we care about Greenland from a geologic perspective. Please join us!

We are also going to have a fun program to look forward to in March. Vice President Craig Moore is organizing our first (hopefully first annual) presentation night for young hobbyists. Everyone 21 and under is encouraged to take up to 10 minutes to talk about a topic of their choice. That promises to be a fun evening showcasing some of the extraordinary talent emerging in our organization.

I'm appealing to the youth regulars in our club to try out your presentation skills. Don't be nervous—you are among friends! Please put together a few slides or bring in some specimens for show-and-tell. I will set up the computer and projector and you guys can have at it! Just please bring any slides on a thumb drive or email them to me ahead of time.

Until then, happy rockhounding, and don't forget to get someone you love a nice rock for Valentine's Day!

Jason



Club Meeting Notes
January 6

by Almas Eftekhari, Secretary

President Jason Zeibel launched the meeting on Zoom by noting the need for the switch to online-only because of heavy snowfall. He said how much he regretted not being able to meet our speaker, Casper Voogt, for dinner at BJ's in Tyson's Corner.

Jason invited any newcomers to our club to introduce themselves, and he asked whether anyone was still having problems receiving his email blasts. He also gave a shoutout to Field Trip Co-Coordinators Katy and Mickey Johnson for their video on the club's 2024 field trips.

Vice President Craig Moore thanked Jason, Casper, and Treasurer Roger Haskins for pivoting to an online-only meeting at the last minute. He noted that our presenter for the February meeting was still to be determined (it will be Thomas Hale presenting on minerals from Greenland—see his program on page 8).

Craig noted that our March meeting will be devoted to short presentations by our younger club members (21 and under). Several speakers are already confirmed. Our spring club auction might need to be pushed to May this year.

Treasurer Roger Haskins offered an explanation for the email problem. He also noted that our club treasury is in good shape, with about $41,000 in funds while being up to date on all dues and taxes. He called on club members to help support our assistance to area school teachers who teach the Earth sciences.

With the business meeting at an end, Craig introduced Casper Voogt, our speaker. Casper, an active club member for many years, is our webmaster; he also manages the websites for other clubs. Casper has traveled the world for minerals, and he is a mineral dealer who routinely has a table at our annual club show.

Casper started his presentation by outlining his travels over many years. He showed slides from the Mindat conference in Morocco in 2012 and from his trip to Madagascar in 2014. He also showed slides of his travels in Myanmar, the Netherlands, Cyprus, and more. He shared stories, travel tips, and photos of his travels and showcased various specimens he collected along the way. Casper also gave tips on going to shows like Tucson, AZ, including where to stay, how to get around, how to shop, and the best way to transport your purchases.

Club members discussed the possibility of asking Katy and Mickey to organize a destination field trip this year to a collecting site where we can spend a few days.



A Billion Years of Geologic History Is Missing From the Grand Canyon

by Stephanie Pappas

Editor's note: *The piece is adapted from LiveScience (26 August 2021).*

The Grand Canyon is a layer cake of geological history, with rocks stacked neatly upon one another as they were laid down millions of years ago. That is, until you get deep into the canyon and find the Great Unconformity, a gap between rock layers representing a billion years in some places.

Even stranger, the Great Unconformity shows up in rocks worldwide—and always in rocks from the same era: about 550 million years ago and earlier. …

Now, Barra Peak, a doctoral student in geology at the University of Colorado in Boulder, and her colleagues have found an explanation. In the Grand Canyon, these rock layers were lost during a tectonic upheaval caused by the breakup of a supercontinent. The findings suggest that, although the Great Unconformity is found in rocks from around the world, the reason for its presence might be different in every place. … *Read more*.

Wildacres in Spring

Wildacres is a fantastic retreat located on Pompeys Knob just off the Blue Ridge Parkway about an hour north of Asheville, NC. Signing up for the May 12-18, 2025, session will give you the opportunity to take classes and hear excellent talks from the speaker-in-residence, Martin D. Fuller, a gemologist and renowned appraiser who will share his passion for gems and jewelry. You will also be able to participate in a variety of other activities.

You can register on the EFMLS Wildacres website. The speaker-in-residence and the courses listed below are firmly lined up for May.

Coming to Wildacres in May 2025 …

Cabochon Cutting (*Rick Marshall*): Learn the basics of creating a cabochon from a slab of rock! You will see a display showing each stage of the process. The class fee ($75) and material costs (up to $40) includes slabs, straight edge, super glue, marker, pen, notepad, instruction manual, polishing materials, and more. Bring an optivisor if you have it. You can bring your own slabs, plus I have slabs available for purchase.. No experience needed. 4-day class.

Chainmaille, beginner (*Jim Hird*): Learn the ancient art of chainmaille, creating fine jewelry using unsoldered links. Basic patterns will be taught using inexpensive copper rings as well as anodized aluminum and colored rubber. Printed handouts provided for all patterns. Lab fee of $20 for handouts. Project prices for base metal kits $20 or less each; total cost will depend on number of projects and type of materials you choose. Tools provided; bringing an optivisor suggested. No experience needed. 2-day class, semester 1.

Chainmaille, intermediate (*Jim Hird*): Build on the basics by doing more advanced patterns, working in more colors, or using gold-filled, argentum, and mixed-ring materials. Total cost will depend on number of projects and what materials you choose. Basic skills required. 2-day class, semester 2.

Faceting (*Bernie Emery*): Learn to cut and polish a 57-facet round brilliant quartz gemstone, how to identify well-cut stones, and select rough material. Materials fee $40. Bring optivisor or loupe. No experience needed. 4-day class.

Photography (*Michael Pabst*): Learn to photograph mineral specimens/lapidary objects at increasing levels of sophistication and magnification. Bring your favorite specimens, camera equipment, and memory sticks. Learn to fix problems using Adobe Photoshop, how to use digital cameras with detachable lenses, how to use Focus Stacking to increase depth-of-field, and how to use a digital camera attached to a stereo microscope. Push the limits of optical magnification using an automated focusing rail to take photos. Materials fee $25. 4-day class.

Metal Clay-Silver (*Susan Brooks*): Learn to use fine silver metal clay to create beautiful pieces of heirloom-quality jewelry. Learn basic skills (texturing, cutting, joining, stone setting, creating embellishments, and bail making). You will have project possibilities and techniques. Bring reading glasses or optivisor. Basic Class Kit fee $275; additional clay available for purchase. Lab fee $50. No previous experience required. 4-day class.

Silversmithing, basic (*Richard Meszler*): Learn to work silver sheet & wire to fabricate jewelry. You get a kit with metals/supplies & a step-by-step description of each project. Materials fee $100. Optivisor an Materials fee $100. Optivisor and apron recommended. d apron recommended. No experience needed. 2-day class, semester 1.

Silversmithing, intermediate (*Richard Meszler*): Learn to make a bezel setting & bail for setting a cabochon to make a pendant. You get a kit with all you need. Materials fee $100. Optivisor and apron recommended. Basic silversmithing experience, including soldering. 2-day class, semester 2.

Wirewrapping (*Jacolyn Campbell*): Use pliers/gold-filled or sterling silver wire/assorted beads or gemstones/ basic wirecraft techniques to create rings, bracelets, pendants, and earrings. All tools/materials provided.

Session I (beginner): Make an adjustable ring, 2 bracelets, pendant, 2 pairs of earrings. Estimated materials cost $100. 2-day class, semester 1.

Session II (intermediate): Make a fitted ring, 2 pairs earrings, cabochon pendant, and bracelet. Estimated materials cost $120. 2-day class, semester 2.

The Rocks Beneath Our Feet

Streambank Mystery in Arlington

by Alex Brown and Hutch Brown

Geology involves more than just rocks and minerals. An old textbook on physical geology (Plummer and McGeary 1996) contains a chapter titled "Streams and Landscapes," which explores stream erosion, stream deposition, valley development, and other stream-related processes. Such processes wear away the bedrock and emplace parent materials for future bedrock; examples in our area include Great Falls and Mather Gorge on the Potomac River and the tight-packed sediments of the Potomac Formation on the Coastal Plain.

As county volunteers, we routinely monitor the upper part of an Arlington stream called Lubber Run for water-polluting bacteria (*E. coli*). The site is located in Woodlawn Park in a relatively flat part of Arlington. One of us (Alex) is a stormwater management specialist for Arlington County with a master's degree in environmental engineering, so he is keenly attuned to our local stream morphology (the shape of stream channels and how they change over time).

Alex noticed an anomaly in what scientists call the soil profile (series of soil layers) in a streambank at the site we monitor. This article explores what we found.

Surprising Soil Layers

The site's streambanks are lightly wooded and deeply incised into the native soils (fig. 1, top), forming a channel more than 6 feet deep. Originally meandering and possibly anabranching (with multiple diverging and reconverging channels), the stream was straightened, shortened, and moved for agricultural and (later) urban purposes; all portions upstream were piped underground by the 1960s. Almost a century of erosion, likely beginning with suburban development in the 1930s, has exposed the bedrock in places.

The bedrock is a "sedimentary melange" (meaning a blend of sedimentary parent materials) in the metamorphic Sykesville Formation, which dates at least to the Cambrian Period (539-485 million years ago). Overlying the bedrock are hard-packed sediments from the Potomac Formation, laid down by Cretaceous rivers 140-100 million years ago. The Cretaceous sediments range in type and size from clays, silts, and sands to pebbles and rounded river rocks.

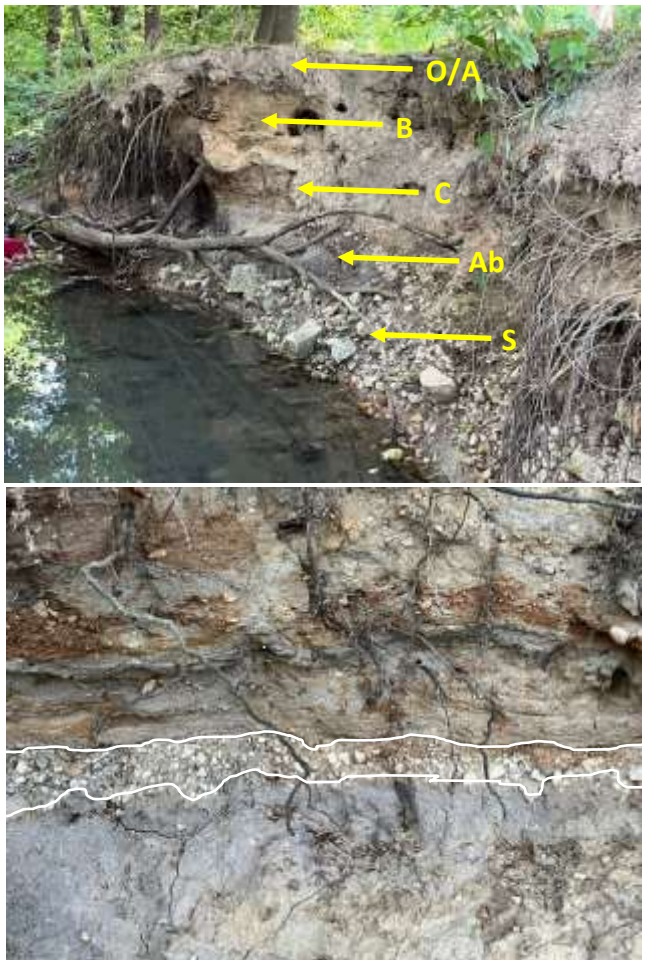


Figure 1—*Upper Lubber Run streambank in Arlington's Woodlawn Park.* ***Top:*** *Soil horizons/sediments, including O and A (rich in organic matter), B (moderately leached, with little organic matter), possible C (heavily leached and rich in iron), Ab (a buried A horizon), and S (Cretaceous sediments).* ***Bottom:*** *White lines frame a band of gravel between a reddish-gray (possible C) horizon (top) and a buried A horizon (bottom), the latter relatively rich in organic matter. Photos: Hutch Brown.*

Topping the Potomac Formation we expected to see the usual soil horizons (layers), which are classified by soil scientists as O, A, B, and C (from top to bottom—see figure 1, top). Organic matter is richest in the O and A horizons (respectively, leaf litter and topsoil), which are typically shades of brown. Organic matter largely decomposes before reaching the B horizon, which is typically light in color. The B and C horizons have rising proportions of iron and aluminum oxides, giving them shades of yellowish-white ranging into reddish-orange.

The O horizon (decomposing leaf litter) at the site was negligible, but we noticed what we thought were the usual A, B, and C horizons (fig. 1, top). Under what we thought was the C horizon, instead of Cretaceous sediments, was a band of gravel over what appeared to be a buried A horizon relatively rich in organic matter (fig. 1, bottom). Both layers seemed out of place, so we took photos, then tried to figure them out.

Soil Analysis

A friend who is a soil scientist came to town for his annual project with The Nature Conservancy. Professor Russell Briggs directs the Division of Soil Science in the College of Environmental Science and Forestry at the State College of New York (SUNY) in Syracuse. When we showed Russ photos from the site, he was intrigued and agreed to take soil samples back to SUNY and have them analyzed for us.

On July 1 of last year, we took Russ to the site and helped him take soil samples from the top of the streambank down to the Cretaceous sediments (fig. 2, top). Russ's SUNY lab analysis found a soil series classified by scientists as Glenelg loams, typical for the Piedmont in our area. (Loams are blends of sand, silt, and clay in roughly equal proportions.)

The analysis found a 14-inch A horizon and a 24-inch B horizon in three parts—but no C horizon at all; what we took for C was instead 10 inches of "redoximorphic features" (redox, for short) in the lowest B (B3) subhorizon (fig. 2, bottom). Redox refers to a soil zone with parts enriched or depleted in iron and manganese oxides after periods of soil saturation and desaturation, creating areas with different shades of grayish- and reddish-brown.

The lab analysis also confirmed an inch-thick band of gravel over a buried A (Ab) horizon 10 inches thick (fig. 2, bottom).

What could possibly have caused all this?

Wetlands and Milldams

Alex knew of studies that offered a clue.

Before European settlement, North America had hundreds of millions of beavers. Beavers were ubiquitous in our area, so beaver dams were common on our local streams. Research has shown that many presettlement streams in the mid-Atlantic region formed anabranching channels within extensive floodplain wetlands maintained for thousands of years by beaver dams.



Figure 2—*Soil profile in an upper Lubber Run streambank (Woodlawn Park, Arlington).* ***Top:*** *Taking samples of the soil horizons.* ***Bottom:*** *Parts of the B horizon (top), a band of gravel (middle), and the buried A (Ab) horizon (bottom). Photos: Hutch Brown.*

Because upland soil disturbances were limited before European settlement, the wetlands accumulated few sediments but stored vast amounts of organic carbon.

By the late 1600s, North American beaver pelts were in high demand in Europe to replace pelts from the

nearly extinct European beaver; the pelts were used to produce fashionable hats. American Indians and colonial trappers supplied the flourishing fur trade. Over time, they trapped out beaver in eastern North America, thereby indirectly draining wetlands and releasing streams to flow unimpeded by beaver dams.

As European colonists settled our area in the 1600s-1700s, they cleared the land for farming. They needed water-powered mills for the grains they grew, so they established thousands of milldams on streams across the mid-Atlantic region. Landscapes across our area were dotted with millponds that gradually filled with sediments from widespread soil disturbances caused by upland logging and farming, burying most traces of presettlement valley-bottom wetlands.

Mystery Solved?

Eroded streambanks can reveal traces of this history. The soil profile from upper Lubber Run seems to show a gray wetland soil in the Ab soil horizon (fig. 2, bottom), possibly from a presettlement marsh. The marsh would have looked much like Huntley Meadows in Alexandria does today (fig. 3).

With beaver removal and stream release, upper Lubber Run would have flowed for a time much as it does today, depositing cobble on gravel bars and leaving a thin band of gravel in the soil profile.

The B horizon probably came from sediments accumulated from erosion in upland areas during Arlington's logging and farming days, possibly at the bottom of an undocumented millpond (we found no historical record of a millpond at the site). Until the 1860s, two large plantations were located in the watershed upstream; upland sediments from stormwater runoff would have elevated the streambed over time. Rather than a millpond, fluctuations in the water table might have saturated and desaturated the site's lower soils, creating the B3 redox subhorizon (fig. 2, bottom).

The organic-rich A horizon at the top of our soil profile would have formed in later years of plant regrowth, death, and decay. Revegetation would have come after Arlington's soils had stabilized following the period of widespread soil disturbances due to land clearing and farming by European settlers.

Implications

Geologists sometimes speak or write about stream morphology in relation to the local bedrock. A prime example is the USGS publication *The River and the Rocks* (Reed and others 1980); though dated, the booklet remains an excellent field guide to the geology of Great Falls National Park and the morphology of the Potomac River in the park.



Figure 3—*Huntley Meadows in Alexandria, VA, a marsh that was formed and is sustained by beaver dams. Source: Somerset House; photo: Hollis Looney.*

Accordingly, rockhounds on geology walks, in addition to studying rock formations and mineral finds, might examine soil profiles along streams for evidence of stream morphology. What you find might surprise you, just as it surprised us on upper Lubber Run.

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February 2025—Upcoming Events in Our Area/Region (see details below)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3 NVMC meeting	4	5 MSDC mtg	6	7	8
9	10 GLMSMC mtg	11	12	13	14 Valentine's Day	15
16	17 Presidents Day	18	19	20	21	22
23	24	25	26 MNCA mtg	27	28	

Event Details

3: Dunn Loring, VA—Northern Virginia Mineral Club; https://www.novamineralclub.org/.

5: Washington, DC—Mineralogical Society of the District of Columbia; info: http://www.mineralogicalsocietyofdc.org/.

10: Rockville, MD—Gem, Lapidary, and Mineral Society of Montgomery County; info: https://www.glmsmc.com/.

26: Arlington, VA—Micromineralogists of the National Capital Area; info: http://www.dcmicrominerals.org/.

No shows in the mid-Atlantic region this month.

(But stay tuned for March—more than usual coming up! At least four in NC, two in PA, and one each in DE and MD.)

The Northern Virginia Mineral Club, Inc.

Visitors are always welcome at our club meetings!

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

Club 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).

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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 club member).

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Meetings: At 7:30 p.m. on the first Monday of each month at the Dunn Loring Fire Station, 2148 Gallows Road, Dunn Loring, VA.* (No meeting in July or August.)

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

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