



THE NORTHERN VIRGINIA MINERAL CLUB INC



The Mineral Newsletter

Next meeting: June 1 Time: 7:30 p.m. (doors open at 7 p.m.)

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



Spessartine with smoky quartz on microcline

Wushan Spessartine Mine, Tongbei, Fujian Province, China

Source: Wikipedia.

Photo: G ry Parent.

Deadline for Submissions

August 20

Please submit to the [editor](#) by the 20th of the month. Submissions received later might go into a later newsletter.

Volume 66, No. 6

June 2026

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June Meeting Program:

Precious Metals in Asteroids

Details on page 4.

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Mineral of the Month Spessartine

by Sue Marcus

Editor's note: The article is a slightly modified reprint of the original from October 2016.

Lovely spessartine can't seem to keep a name. This member of the garnet family was always known from the Spessart Mountains of Germany, although Martin Klaproth originally named it *granatförmiges Braunsteinerz* ("granitoidal manganese ore") in 1797. The name became "manganesian garnet" in 1823 before François Sulpice Beudant, in 1832, bestowed its current name of spessartine, for the original locality.

Spessartine can be found in all major rock types—in metamorphic and igneous rocks as a primary mineral. In sedimentary rocks, it erodes from the other rock types and is deposited in the sediments.

As part of the Garnet Group, spessartine shares elements with a spectrum of others in the group, such as pyrope and almandine. All can form gem-quality materials. A mixture of pyrope and spessartine called Malaya garnet (an unofficial name), from Tanzania and Kenya, is used in jewelry. Malaya garnets occur in unique and rare colors, like pink-orange, red-orange, and yellow-orange.

A different rare hybrid of spessartine and pyrope is reported by gemselect.com. This variant changes color, depending on the light source. The hybrid is not truly pleochroic, because "pleochroic" applies only to doubly refractive minerals and these garnets are singly refractive.

China has been a recent source of beautiful spessartine specimens (see the cover photo). The bright orange-red spessartine crystals stand out against white albite. The pegmatites of Afghanistan, Brazil, and Pakistan are also significant spessartine producers. An orange variant is found in Madagascar; closer to home, violet-red spessartines come from Colorado and Maine. San Diego County, CA, has been the main spessartine producer in the United States, with an estimated 40,000 to 50,000 carats of faceting-grade rough material mined between 1956 and 1994.

A challenge for collectors is knowing when the garnet you found is spessartine. It is usually impossible to tell without extensive and often expensive analysis. My rule of thumb—and it is no more than that—is to

Summer break ahead!



Northern Virginia Mineral Club members,

Our next club meeting will be on June 1, 7:30 p.m. (doors open at 7 p.m.), in person at our usual meeting place, the Dunn Loring Fire Station in Fairfax. Our speaker will be Mitch Hunter-Scullion (see the program on page 4), who will join us via Zoom.

Note: We will not meet for dinner beforehand.



Spessartine, Noni Hill, Loliondo, Arusha Region, Tanzania.
Source: Mindat; photo: Rob Lavinsky.



Spessartine with quartz, Penha do Norte, Minas Gerais, Brazil. Source: Mindat; photo: Rob Lavinsky.

find well-referenced literature on the collecting locality and go with what is given there. That may be the wimpy route—you may have found something new for your locality, though getting it verified as such may be difficult.

While looking at sources for this article, I noticed that even high-level dealers like John Betts listed many of the garnet specimens as “Almandine-Spessartine,” presumably because it was somewhere along that part of the Garnet Group spectrum. Garnets are relatively easy and fun to find, so happy and safe collecting! ➤

Technical Details

Chemical formula $\text{Mn}_3^{2+}\text{Al}_2(\text{SiO}_4)_3$

Crystal form..... Isometric

Hardness..... 6.5-7.5

Density 4.12-4.32 g/cm³ (measured)

Color Usually deep or dark red, to slightly purplish red, brown, less frequently orange

Streak White

Cleavage..... None

Fracture Subconchoidal

Luster Vitreous



Spessartine with schorl on albite, Little Three Mine, Ramona Mining District, San Diego, California. Source: Mindat; photo: Rob Lavinsky.



Sources

- GemSelect. 2016. [Spessartite garnet gemstone information.](#)
- GemSelect. 2016. [Pleochroic gemstones.](#)
- Laur, B.M.; Knox, K. 2001. [Spessartine garnet from Ramona, San Diego County, CA.](#) Gems and Gemology 37(4).
- Mindat. 2016. [Spessartine.](#)
- Minerals.net. 2016. [The mineral spessartine.](#)
- Wikipedia. 2016. [Spessartine.](#)

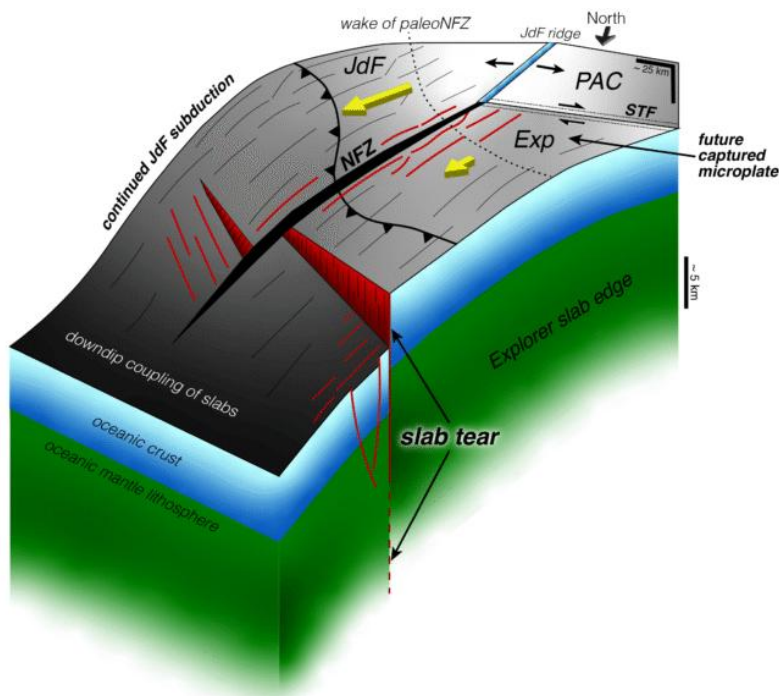


Mitch Hunter-Scullion Precious Metals in Asteroids June 1 Program

Our June speaker is Mitch Hunter-Scullion, who will join us via Zoom.

Mr. Hunter-Scullion founded the Asteroid Mining Corporation in March 2016 after completing his university dissertation under the title, “The Case for Asteroid Mining: Examining the Economic and Political Benefits to be Gained From Mining in Space.”

The Asteroid Mining Corporation aims to advance human progress and civilization by mining asteroids. Asteroids have been dubbed “flying gold mines” because they contain such valuable metals. Mr. Hunter-Scullion will show his collection of meteorites to illustrate the asteroids that he hopes to mine. ➤



Earth’s Crust Is Tearing Apart Off the Pacific Northwest

by the Columbia Climate School

Editor’s note: The article is from *State of the Planet*, 30 September 2025. Thanks to Sue Marcus for the reference!

Scientists have observed a subduction zone—the collision point where one tectonic plate dives beneath another—actively breaking apart. The discovery sheds new light on how Earth’s surface evolves and raises fresh questions about future earthquake risks in the Pacific Northwest.

Subduction zones are the sites of Earth’s most powerful tectonic events. They drive continents across the globe, unleash devastating earthquakes and volcanic eruptions, and recycle the planet’s crust deep into the mantle.

“Getting a subduction zone started is like trying to push a train uphill—it takes a huge effort,” said Brandon Shuck, an assistant professor at Louisiana State University and lead author of the study. “But once it’s moving, it’s like the train is racing downhill, impossible to stop. Ending it requires something dramatic—basically, a train wreck.”

The northern end of the Cascadia subduction zone, where the Juan de Fuca (JdF) and Explorer (Exp) Plates slowly move beneath the North American Plate, is gradually shutting down piece by piece, with small pieces of the plate breaking off while the remaining plate continues to subduct until the next tear occurs.

Subduction zones don’t last forever. If they did, continents would endlessly collide and stack up, erasing oceans and wiping out the record of Earth’s past. The big question is this: How exactly do these mighty systems finally shut down?

Off the coast of Vancouver Island, in a region of Cascadia where the JdF and Exp Plates slowly move beneath the North American Plate, scientists have found the answer. Using a combination of seismic reflection imaging—essentially, an ultrasound of Earth’s subsurface—and detailed earthquake records, the team has captured a subduction zone in the process of tearing itself apart.

Read more [here](#). ➤



Meeting Summary March 2 Club Meeting

by Almas Eftekhari, Secretary

President Jason Zeibel kicked off the meeting by inviting visitors to introduce themselves. Carson Jones, who is new to Virginia, has a bachelor's degree in geology and is interested in field trips. Zhongqing Wei is a chemist who lives in Falls Church and is interested in mineralogy. Katie Weisner loves collecting locally and is interested in geology walks and lapidary work. Anna, who just graduated and moved from New York City, is a "natural science nerd" who loves volcanic rocks.

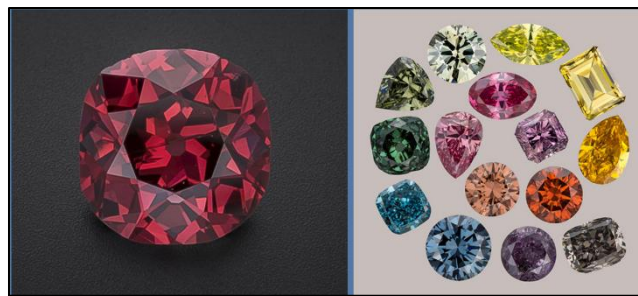
Hutch Brown led a geology walk on May 9 in Arlington's Glencarlyn Park (see page 14). Jason reminded everyone that you have to be a club member to go on field trips because of insurance liability. Field Trip Co-Coordinator Katy Johnson told new members how to register for field trips online through the Google forms that she sends out to members.

Jason announced the club summer picnic coming up on August 16, 2-6 p.m., at "Zeibel National Park," his spacious property. Mark your calendars! If you haven't already joined our Instagram account, please do so; to submit content, contact Youth Coordinators Maria Nopo and Celia Zeibel. We are also asking folks to submit articles about how they got interested in our hobby to Editor Hutch Brown.

Jason noted that club auctions are twice a year, in spring and fall. For the fall auction, we will have lots designated, respectively, for new members and youth members to give everyone a chance to collect.

Vice President Jennifer Grimes introduced our speaker, Dr. Gabriela Farfan, a mineralogist and the Coralyn W. Whitney Curator of Gems and Minerals at the Smithsonian. She received her bachelor's degree in geological and environmental sciences from Stanford University and her Ph.D. in geochemistry from the MIT-WHOI Joint Program.

Dr. Farfan spoke about the Smithsonian's collection of fancy colored diamonds, including the Winston Red Diamond. The Winston Red was gifted to the Smithsonian National Gem Collection by Ronald Winston in 2023 and unveiled in April 2025. It is only 2.33 carats, but its unique Old Mine Brilliant cut and specific facet style hint at a fairly long history.



The Winston Red Diamond and the collection of fancy diamonds on display at the Smithsonian's National Museum of Natural History.

Diamond grading typically relies on the four C's—carat, cut, clarity, and color. Diamond coloration stems from variations in impurities at the atomic level: nitrogen causes yellow, boron blue, and radiation vacancies produce green. Pinks and reds result from a rare plastic deformation of the rock under intense heat and pressure. Only one in 25 million diamonds is a fancy red. Advanced technology to analyze graining patterns showed that the Winston Red shares a spectrum with pink diamonds. It's actually an extreme pink diamond.

Uncovering the diamond's geographic and historical lineage required some detective work because the original history had been lost. Researchers traced the stone to India, where the Winston Red was part of a the Ceremonial Necklace of Nawanager created by Jacques Cartier in 1926 for the Maharaja of Nawanager. The Maharaja purchased the diamond from Cartier in 1938 and added it to the necklace. After the necklace was dismantled decades later, the diamond was sold to Ronald Winston. It even made a famous public appearance in 1989 when the actress Brooke Shields wore it in a ring for a Tokyo store opening.

Dr. Farfan highlighted other spectacular recent acquisitions, including the Zaza Azul tourmaline, a spessartine garnet, a red spinel, a trapiche emerald pair, a ruby rose brooch, and intricate gem carvings like the Trinity Morganite Cockatoos, a blue topaz chameleon, and a quartz ermine.

Almas Eftekhari and Jake Broughton gave some tips about ticks in honor of Lyme Disease Awareness Month. This year will have a particularly bad season, so make sure to wear preventatives, check for ticks after collecting, save any tick for testing, and get medical attention right after any bites. ↗

President's Message

by Jason Zeibel

Greetings, NVMC, and welcome to June! As I write this, the temperatures are soaring into the mid-90s. It always seems so shocking when, for the first time each year, I'm hit with the heat and humidity that frequently characterize summer life in the mid-Atlantic region.

Another aspect of this time of year that comes quickly is the end of the academic year. It seems like the school year just began, and yet here we are faced with final exams and graduations. For our family, this is the penultimate year of our fixed, familiar routine. Next year will come with a series of "last time for this" events, and I'm not quite sure I'm ready for the mixed emotions that will present. As it is, family dinnertime conversation often revolves around college application essays, SAT preparations, and a litany of things to check off the proverbial bucket list before heading away for college. I'm sure it will happen all too quickly.

Regular readers of my column got to hear about an amazing family trip we made to the Virgin Islands last month. This month, I will recount some adventures from an entirely different form of trip. Due to a confluence of optimally timed business travel for my wife Audra and me, we had the opportunity to spend a long weekend together in Lisbon, Portugal. We don't often have the opportunity for what felt like an "escape vacation" without our girls and other family members. Yet there we were, left to explore a country that neither of us had ever visited before. For the purposes of this article, I want to highlight some of the geologically themed aspects of our brief time in Portugal.

In view of the presentation at the May club meeting on the diamond collection at the Smithsonian, we decided to take a tour of the Portuguese Royal Treasury Museum (figs. 1-2). From the 14th to the 18th century, Portuguese explorers were some of the richest and most respected in the world. Portugal had [colonies and outposts](#) from the Americas to Africa, the Middle East, India, China, and Southeast Asia.

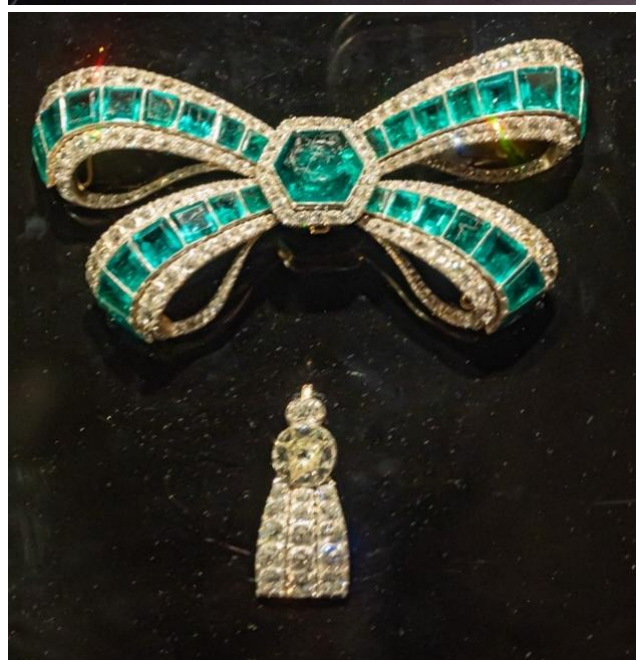


Figure 1—Royal Treasury Museum at the Ajuda Palace, Lisbon, Portugal. **Top:** Audra outside the palace. **Center:** Gold and jewels on display. **Bottom:** The Bodice Ornament, an 18th-century stomacher featuring diamonds and Colombian emeralds. The central emerald is a hexagonal-cut Brazilian emerald weighing 47.91 carats. All photos: Jason Zeibel.



Figure 2—*Treasures on display at the Royal Treasury Museum at the Ajuda Palace in Lisbon. **Top:** Diadem of the Stars, commissioned by Queen Consort Maria Pia of Savoy and designed by Portuguese court jeweler Estevao de Sousa. **Bottom:** King Joao VI's Badge of the Order of the Golden Fleece. 10.6 inches long, it represents a prestigious Catholic chivalric order. It was commissioned in 1800 and has over 300 carats of Brazilian diamonds (1,741 total), 190 rubies, and a single enormous sapphire weighing 37.75 carats.*

Much of the wealth of the Portuguese Empire made its way back to Lisbon, making a relatively small country one of the world's richest and most important nations. Much of the gold and many gems and other colonial treasures ended up in the hands of the Portuguese royal family in Lisbon.

On November 1, 1755, much of Lisbon literally came crashing down. At 9:40 a.m., an earthquake estimated at magnitude 8 struck about 180 miles southwest of Lisbon in the Atlantic Ocean along a thrust fault about 30 miles long. The quake opened fissures up to 16 feet wide in downtown Lisbon. The fragile stone masonry of old Lisbon crumbled under the force of the earthquake, reducing much of the city to rubble.

About 40 minutes later, a series of tsunami waves topping 20 feet in height inundated much of the city. Following the tsunamis, much of the city was engulfed in flames stemming in part from candles burning citywide in honor of All Saints Day. The fires burned for over 5 days.

In the end, over 40,000 people died, and almost nothing remained of Lisbon's city center. Even buildings that had survived the earthquake and tsunamis were later destroyed by fire. A museum in central Lisbon tells the story of the great earthquake (fig. 3), with maps, drawings, and written accounts.

The earthquake disrupted the Portuguese Empire, slashing Portugal's gross domestic product by about 40 percent. Prices and wages remained volatile for years following the tragedy. Even though the royal family escaped, its palaces were mostly destroyed, and most items in the treasury were lost.

The royal family lived in tents and out of town for years, until King Joseph I died. Eventually, his daughter, Queen Maria I, moved the family back into a newly built Palace of Ajuda, which still stands on the site of the old tent camp.

But the loss of the library and historical artifacts would be felt for the next century. The monarchy lost effectiveness, and the Portuguese Empire faded in importance after the earthquake. In the early 20th century, the Portuguese monarchy was abolished after a series of weak monarchs and a period of economic stagnation.

A republic was formed in 1910, but it lasted only until 1926, when a coup installed an authoritarian re-



Figure 3—Lisbon Earthquake of 1755. *Top:* Jason at the Quake Museum in Lisbon, which documents the disastrous earthquake, tsunamis, and fires that devastated Lisbon on November 1, 1755. *Bottom:* Redesign of Lisbon streets following the earthquake, with the original curvy streets (red lines, lower right) replaced with a grid of wider avenues for better responding to fires and natural disasters.

gime. In 1933, Antonio de Oliveira Salazar took control, ruling over a brutal right-wing and isolationist regime known as the Estado Novo. Many royal treasures were dispersed via a combination of sales, theft, and gifts to friends of the dictator.

On April 25, 1974, the Carnation Revolution ended the dictatorship and led to a new democracy in Portugal that continues to this day. Since then, the remaining Portuguese treasures as well as some items that could be reclaimed were assembled in a Royal Treasury Museum on the grounds of the Ajuda Palace. The museum houses a three-story vault with a mix of

gold, silver, gems, royal crowns, serving dishes, and jewelry. Many of the treasures commissioned by the royal family after the great earthquake are now on display at the museum.

One particularly noteworthy monarch in terms of amazing gems and jewelry was the Queen Consort Maria Pia. Maria became Queen Consort upon her marriage to King Luis I of Portugal in 1862. She was Italian and known for her impeccable style, including in commissioning exquisite jewelry. Her Diadem of the Stars (fig. 2, top) is a remarkable work of art that holds dozens of huge diamonds, including a central yellow one known simply as the “Maria Pia.” Other treasures on display include a bowling-ball-size Brazilian gold nugget, the Bodice Ornament featuring Colombian emeralds (fig. 1, bottom), and the Order of the Golden Fleece with an amazing sapphire (fig. 2, bottom).

Another interesting geological location that we visited was Cabo da Roca. This site is the westernmost point on the continent of Europe. The view of the granite cliffs meeting great waves coming in from the



View from Cabo da Roca, looking westward towards the Atlantic Ocean.



Cabo da Roca lighthouse overlooking the Atlantic Ocean.

Atlantic Ocean is truly impressive. A little farther up the coast is Nazaré, where offshore canyons and ocean currents create enormous waves beloved by the surfing community.

The [cliffs at Cabo da Roca](#), over 300 feet high, cut into crystalline rock composed of strongly folded and faulted sedimentary units. The area is the extreme western immersion of the ancient Sintra Massif, as evident from the rose-colored granite and syenite. There are geomorphological examples of gabbro-diorite, volcanic breccia, and granite. At Cabo da Roca, there is always ocean mist and cool onshore winds making a walk along the coast almost ethereal. The site hosts a lighthouse built in 1772 warning mariners of the rocky shores and steep cliffs.

Our May meeting featured a truly exceptional presentation by Dr. Gabriela Farfan of the Smithsonian on the Winston Red Diamond as well as other amazing colored diamonds. I really enjoyed all the references to scanning electron microscopy, photoluminescence spectroscopy, and Raman spectroscopy. I use these characterization techniques in my work with the Army. It was great to see them used for something entirely different.

According to Dr. Farfan, they were used to characterize the Winston Red type of diamond, as well as to determine provenance and ultimately even the mining district in South America where the diamond came out of the ground. Her storytelling was captivating, and the detective work that she and her team performed to comb through media and other records from Cartier going back a hundred years made for an

entertaining evening. I was also amazed that the staff at the Smithsonian allowed Dr. Farfan to immerse the Winston Red in liquid nitrogen to do UV-vis spectroscopy on it!

As we gear up for some awesome field trips this summer (thanks, Katy!) we also got a very timely and critically important reminder about protecting ourselves from ticks. Club Secretary Almas and our A/V guru Jake, both advocates for Lyme disease awareness, provided us with some good tips and tricks for minimizing our chances of contracting tickborne diseases. With the number of tick bites rising quickly in the mid-Atlantic region, this is especially important information.

Another thing to look forward to is the summer club picnic. It's still a couple months away, but mark your calendars for Sunday, August 16, 2-6 p.m., at the Zeibel estate. The club will provide protein (burgers, hot dogs, bean-burgers, etc.) and nonalcoholic beverages. We ask that if you come to the picnic, please bring either a side dish or dessert to share with others. The picnic is also an opportunity to share, sell, and swap minerals. We set up tables out in the yard for people to bring rocks. I would ask that you clearly mark as to whether you bring items for giveaway, for sale, or for swap.

I want to remind everyone that the latest club name tag order has come in. If you requested one, please come pick it up and pay \$15 to the club.

Also, if you have not paid your 2026 club dues, please do so! Only dues-paying current members are authorized to sell things at our auctions and to go on field trips.

One more thing: we plan to take orders for club hoodies starting at the club picnic, and we will have them in time for the fall show in November.

This month's program is going to once again be one not to miss (see the program on page 4): we will hear about asteroids from one of the world's leading experts in the field. It will be out of this world! 🌌

Jason

NVMC Had a Busy May: Two Field Trips!

by Katy Johnson, Field Trip Co-Coordinator

The NVMC held its inaugural collecting trip for 2026 on May 3 at Martin Marietta's Texas Quarry in Maryland. The day could not have been more perfect.

Texas Quarry—Limestone and More

We were greeted by Trevor Hedrick, Texas Quarry's fabulous manager, who enthusiastically shared his knowledge about the Texas Quarry, one of the oldest quarries in the country. Quarrying began in 1791 by an Irish family using a pickax and shovel. Being potato farmers, they capitalized on the limestone for the lime they needed as fertilizer for farming.

According to the *Baltimore Sun*, the town was originally called Ellengowan, renamed Texas after Irish immigrants returned from serving in Texas's war of independence from Mexico (1835-36).

In 1848, Texas marble from the quarry was used to build the bottom third (156 feet) of the Washington Monument in Washington, DC. For political reasons, the middle third was built in 1854 from stone that came from Sheffield, MA. The final third was built from Cockeysville marble that came from the Beaverdam Quarry about a mile and a half away from the Texas Quarry. The monument's final stone was laid on July 4, 1848.

I encourage you to find out more about this amazing quarry's history. If you would like to learn more about the Texas Quarry and Martin Marietta, please send an email to fieldtrips@novaminalclub.org requesting access to a private video detailing the rich history of the quarry. It really is too good not to share.

Local Geology: Arlington's Glencarlyn Park

We continued our May adventures with a local geology walk on May 9 in Arlington's Glencarlyn Park, led by our very own Hutch Brown (see his article on page 14). It was another perfect day for exploring a local gem of a park. We started at the Long Branch Nature Center (the NVMC's longtime meeting place before COVID). Our next stop was along the Long Branch tributary of Four Mile Run, where Hutch showed us the local bedrock, Indian Run sedimentary melange. While there, he was also able to show us the visible signs of the tectonic uplift.



Scenes from our collecting trip to the Texas Quarry in Baltimore County, Maryland. Photos: Katy Johnson (top/center); Trevor Hedrick (bottom).

Hutch has a magnificent way of telling the story of our local rocks and pointing out the obvious but often missed details. The most fascinating detail—and my own “aha moment”—on this walk came from learning about the rounded river rocks that make up the Cretaceous and Tertiary deposits overlying the bedrock, which are visible along the streams and trails.

We then spent a little time on the granite exposure at Huffman’s Falls on Four Mile Run, partly to learn about the Fall Line zone, the WO&D Trail (visible from the trails we took), and some local history of the area.

We finished our walk with a special treat, a decent-sized shoot of an American chestnut tree. The American chestnut is functionally extinct but still occasionally sprouts from old rootstocks.

We also learned that this very special park, due to its steep terrain, was largely spared from logging and is host to old-growth forest more than a century old. Who knew? Hidden just a few miles from a major city, nestled in a busy suburb, is old-growth forest! As the title of this series says, Local Geology Walks—and we appreciate Hutch for leading this walk!

Again, special thanks to both Trevor and Hutch for sharing your time, knowledge, and enthusiasm with us! 📷.



Outcrop of Indian Run sedimentary melange along Long Branch in Glencarlyn Park. Photo: Hutch Brown.



*Scenes from our geology walk in Arlington’s Glencarlyn Park. **Top:** Participants gathered outside the Long Branch Nature Center in Four Mile Run Gorge. **Center:** Hutch Brown talking about the granite outcrop at Huffman’s Falls on Four Mile Run. **Bottom:** Field trip participants at Huffman’s Falls. Photos: Katy Johnson.*



Massive 11,000-Carat Ruby Found in Myanmar

Editor's note: The article is from the Associated Press, 8 May 2026. Thanks to Craig Moore for the reference!

Miners in Myanmar discovered a rare ruby of enormous size, the second-largest by weight ever found in Myanmar (formerly known as Burma).

The ruby, measuring 11,000 carats (4.8 pounds), was unearthed near the town of Mogok in the upper Mandalay region, the heartland of Myanmar's lucrative gem-mining industry.

According to a report from the state-run Global New Light of Myanmar, the newly found rough ruby was discovered in mid-April, just after the traditional New Year festival.

Although it weighs roughly half as much as a 21,450-carat (9.45-pound) stone found in 1996, the new discovery is considered more valuable due to its superior color and quality. It is described as having a purplish-red hue with yellowish undertones, a high-quality color grade, moderate transparency, and a highly reflective surface.

Myanmar produces as much as 90 percent of the world's rubies, primarily from the areas of Mogok and Mong Hsu. Gemstones, both legitimately traded and smuggled, are a major source of revenue for Myanmar. ... [Read more here.](#) ↗

Death of Supercontinents Surfaces Diamonds

by Paul Voosen

Editor's note: The article is from Science, 26 August 2023. Thanks to Sue Marcus for the reference!

Forged under extreme temperatures and pressures more than 150 kilometers down in the mantle, diamonds ride rockets to reach Earth's surface: narrow pipes of magma called kimberlite that can erupt at the tremendous speed of sound. Strangely, most kimberlite pipes are found in the quiet, ancient interiors of continents. They are far from where most other eruptions occur: at the edges of tectonic plates and near mantle plumes, broad upwellings that form volcanic hot spots such as Hawaii or Yellowstone. "How on Earth did these get here?" asks Thomas Gernon, a geologist at the University of Southampton. "It was an elephant in the room that no one had a good explanation for."

Now, Gernon and his colleagues believe they do. They say the timing and location of these diamond-bearing eruptions suggest they are after-effects of the breakup of supercontinents, which causes whirling turbulence in the viscous mantle. Like slow-motion tidal waves of rock, the swells ripple beneath the continents, traveling hundreds of kilometers over the course of millions of years—and occasionally triggering kimberlite eruptions.

The finding is about more than diamonds and kimberlites, says Folarin Kolawole, a structural geologist at Columbia University who is unaffiliated with the study. It suggests that tectonic action near Earth's surface can influence the behavior of the mantle on a broader scale than once thought. It also indicates that the underground waves keep the margins of newly divided continents volcanically active far longer than expected, possibly explaining other volcanic rocks that had previously been chalked up to mantle plumes. ... [Read more here.](#) ↗



Kimberlite mine for diamonds in Yakutia, Russia.

Educators Thank NVMC

Over the last 3 years, the NVMC has participated in STEAM nights at several elementary schools in our area: Laurel Ridge, Marshall, and Providence. Our club's table features a hands-on interactive display under the title "Minerals in Our Lives." Each item we use every day is paired with the rock or mineral it came from—items like board (gypsum), toothpaste (feldspar and fluorite), makeup (mica), copper pipe (chalcopyrite), and so on. A mineral display case features colorful specimens chosen to attract student interest. The program has been well received, and we keep getting invited back! Here's a sample note of thanks from one of the schools:

Dear STEAM Night Exhibitors,

On behalf of Laurel Ridge Elementary School PTA, thank you for your participation in our recent STEAM Night. Your organization's time, effort, and creativity played a key role in making the evening such a success.

We were thrilled to welcome nearly 400 attendees and over 30 exhibitors. Even with the rainy weather, the turnout was fantastic—a true testament to the excitement surrounding STEAM learning in our community.

Students, their families, and school administration were so impressed with the creative, interactive activities and the range of content offered by exhibitors. Experiences like the one you provided help bring science, technology, engineering, arts, and mathematics to life in meaningful and memorable ways for our students. We are especially grateful for the engaging, hands-on opportunities you offered.

Thank you again for your support and for helping us create such a dynamic and enriching event. We hope to partner with you again in the future.

Warm regards,
Laurel Ridge Elementary School PTA STEAM Committee





The Rocks Beneath Our Feet **Geology of Glencarlyn Park, Arlington**

by Hutch Brown

On May 9, I led a group of about 15-20 NVMC members on a geology walk through part of Glencarlyn Park in Arlington. The 100-acre park is in the spectacular gorge cut by Four Mile Run and its tributaries (fig. 1, top), including Long Branch in west-central Arlington near the Fairfax County line.

Most forest in the park has never been logged. A nongovernmental organization called the Old-Growth Forest Network estimated the forest community's age at 100 years, but some trees (judging from tree rings) are considerably older. Relatively free of invasive plants, the native old-growth forest contains county-designated champion trees. Arlington County has given parts of Glencarlyn Park special protection as designated natural resource conservation areas.

We gathered at the Long Branch Nature Center, where our club held meetings for 37 years (until the COVID pandemic in 2020). We started with an overview of our area's geology using a detail from the geologic map for Arlington County (fig. 1, bottom).

Geologic Setting

The map reflects a hilly Piedmont landscape resulting from gentle regional uplift and downcutting by streams, including Four Mile Run (flowing from top center of the map southeastward to lower right) and Long Branch (coming in from the left). Both streams have gravel bars with relatively recent alluvial deposits (yellow, **Qal**), laid down during the Quaternary Period within the last 3 million years.

The alluvium comes partly from the bedrock (brown), a metamorphic rock known as Indian Run sedimentary melange. But most of it comes from two layers of sediments overlying the bedrock, the older (Cretaceous) Potomac Formation (green, **Kpu/Kps**) and the younger Neogene deposits, formerly known to geologists as Tertiary Terraces (orange, **Tt3**).

Downstream, Four Mile Run flows under Columbia Pike and eventually onto the Coastal Plain, where the Neogene and Cretaceous sediments become thousands of feet thick towards Chesapeake Bay. Tidal rivers and streams meander across the Coastal Plain, with no bedrock exposed.

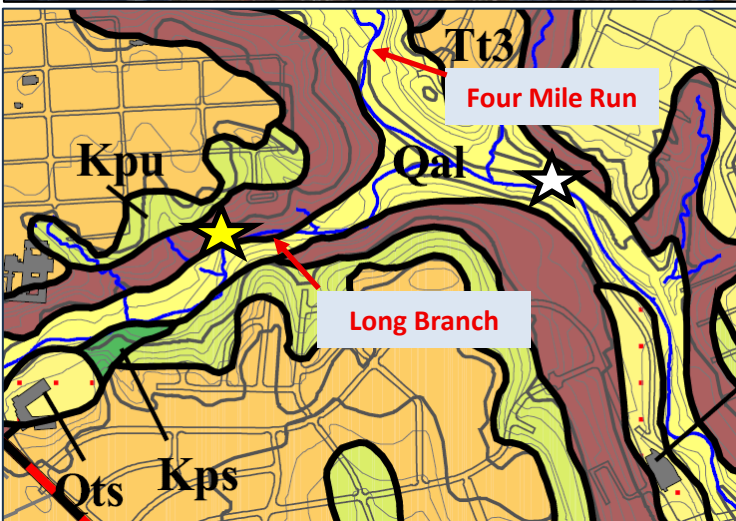


Figure 1—Glencarlyn Park in Arlington. **Top:** Four Mile Run Gorge below Huffman's Falls. **Bottom:** Detail from a geologic map of Arlington County. Brown = Indian Run sedimentary melange; green = Cretaceous sediments; orange = Neogene sediments; yellow = Quaternary alluvium. Stars show the Long Branch Nature Center (yellow) and Huffman's Falls (white). Photo: Hutch Brown; map: Frost and Ernest (1999).



Figure 2—About 490 million years ago, the southern part (the Taconian Terrane) of a tectonic plate approaches proto-North America (red arrow), closing the remnant Iapetus Ocean. Source: Herman (2013).

Let's start with the bedrock. About half a billion years ago, Earth's continental plates were converging. A small plate (fig. 2), driven by convection currents in the viscous [asthenosphere](#) underlying Earth's solid [lithosphere](#), was approaching proto-North America. Geologists call it the Taconian (or Taconic) Terrane.

As it approached the continent, the Taconian Terrane formed a line of volcanic islands behind a deep-sea trench where the continental plate subducted (slid under) the advancing plate and melted into the asthenosphere (fig. 3). The melting rock rose in plumes of magma to erupt on the seafloor, forming an arc (curved line) of volcanic islands. Volcanic ash and eroding sediments accumulated in the forearc basin, and accretionary sediments scraped up from the colliding plates collected in the deep-sea trench.

As the collision progressed, the advancing Taconian Terrane pushed the sedimentary seafloor rocks up onto the continental margin, followed by the volcanic islands and backarc rocks. It was what geologists call an orogeny, [tectonic](#) uplift of a great mountain chain as high as the Alps are today. The mountains are long since gone, but the enormous heat and pressure of the mountain-building event altered the sedimentary seafloor rocks into the metamorphic rocks we find in the Piedmont today. They are the roots of the ancient Taconian Mountains.

Bedrock Types

The metamorphic mountain roots include the Indian Run sedimentary melange shown in brown on the

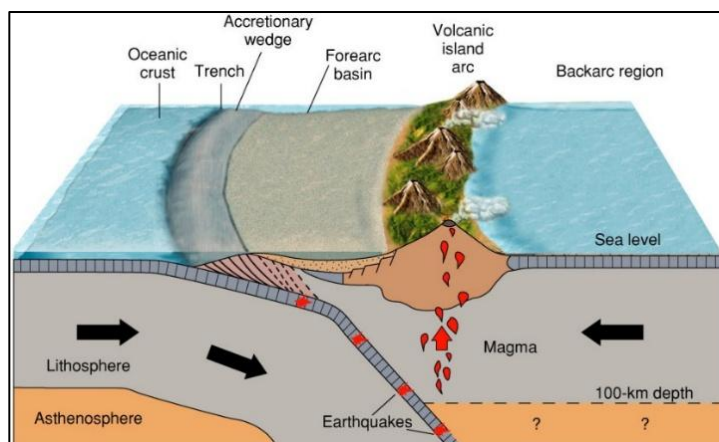


Figure 3—Subduction of the proto-North-American plate under the advancing Taconian Terrane about 470 million years ago. As the subducting plate melts into the asthenosphere, rising magma forms an arc of volcanic islands. Sediments filling the forearc basin and deep-sea trench harden into sedimentary seafloor rock, forming the basis for much of the metamorphic rock in our area today. Source: Herman (2013).

geologic map for Arlington County (fig. 1, bottom). No other bedrock is shown on the map, so if you stripped away the sediments overlying the bedrock (fig. 1, bottom, yellow/green/orange), you might expect to find everything in brown—nothing but Indian Run sedimentary melange.

But you would be wrong because another type of bedrock shows up along Four Mile Run in an exposure too small for geologic mapping. A granite outcrop makes up part of Huffman's Falls (fig. 1, bottom, white star). Related exposures of igneous bedrock intrude the Indian Run sedimentary melange along Holmes Run in Alexandria (see the [October 2025 issue](#) of this newsletter).

Along both streams, the igneous exposures had the same tectonic origins during the Taconian Orogeny, which took place about 474-450 million years ago. Geologists estimate those dates, in part, from [isotopic dating](#) of Occoquan granite, which originated about 484 million years ago (Bentley 2020).

Granite is an igneous rock formed from magma. As the Taconian island arc took shape (fig. 3), rising plumes of magma penetrated sedimentary seafloor rock, then cooled deep underground and crystallized into granite. Such tectonic processes associated with the Taconian Orogeny account for igneous outcrops across our area, including the small granite outcrop at Huffman's Falls along Four Mile Run.

Riverine Sediments

But what about the two sediment layers shown on the geologic map as overlying the Indian Run bedrock (fig. 1, green/orange)? Where did they come from?

About 320-280 million years ago, as Earth's continents were combining into a single supercontinent called Pangaea (pronounced pan-JEE-uh), proto-Africa closed a remnant ocean and collided with proto-North America (fig. 4, top). What geologists call the Alleghanian Orogeny raised a mountain range as high as the Himalayas are today.

In the process, the tremendous pressure of the orogeny broke off great sheets of bedrock (fig. 4, top), including Indian Run sedimentary melange. The collision transported the Indian Run and other Taconian rocks on great, nearly horizontal thrust faults to where we find them in the Piedmont today. (Geologic maps show them as upturned.)

Supercontinents inevitably break up along ancient fault lines—weaknesses in the rock. Beginning about 230 million years ago, rising magma from Earth's asthenosphere penetrated the suture zone between Africa and North America (fig. 4, center), forming a widening rift zone that became the Atlantic Ocean.

In the process, parallel rifts formed between the North American craton (the older continental rock) and the younger Taconian rocks, now part of the Piedmont. The Piedmont rocks slid down along great fault lines (fig. 4, center/bottom, red arrows) to form rift basins that filled with sediments over tens of millions of years. The accumulating sediments hardened into rock in what geologists call the Triassic basins (fig. 4, center/bottom). Culpeper Basin, for example, extends from Bull Run Mountain (successor of the ridges shown in figure 4, bottom) into northwestern Fairfax County.

The breakup of Pangaea was followed by what geologists call an orogenic calm, with little tectonic activity as the Atlantic Ocean continued to widen (as it still does today). By about 140 million years ago, much of our area was a relatively flat plain drained by great rivers, predecessors of today's Potomac.

The rivers carried silts, sands, and rounded river rocks from Culpeper Basin and farther inland, depositing them in thickening layers as they approached sea level on the Coastal Plain. First came the riverine sediments of the Potomac Formation (fig. 1, bottom,

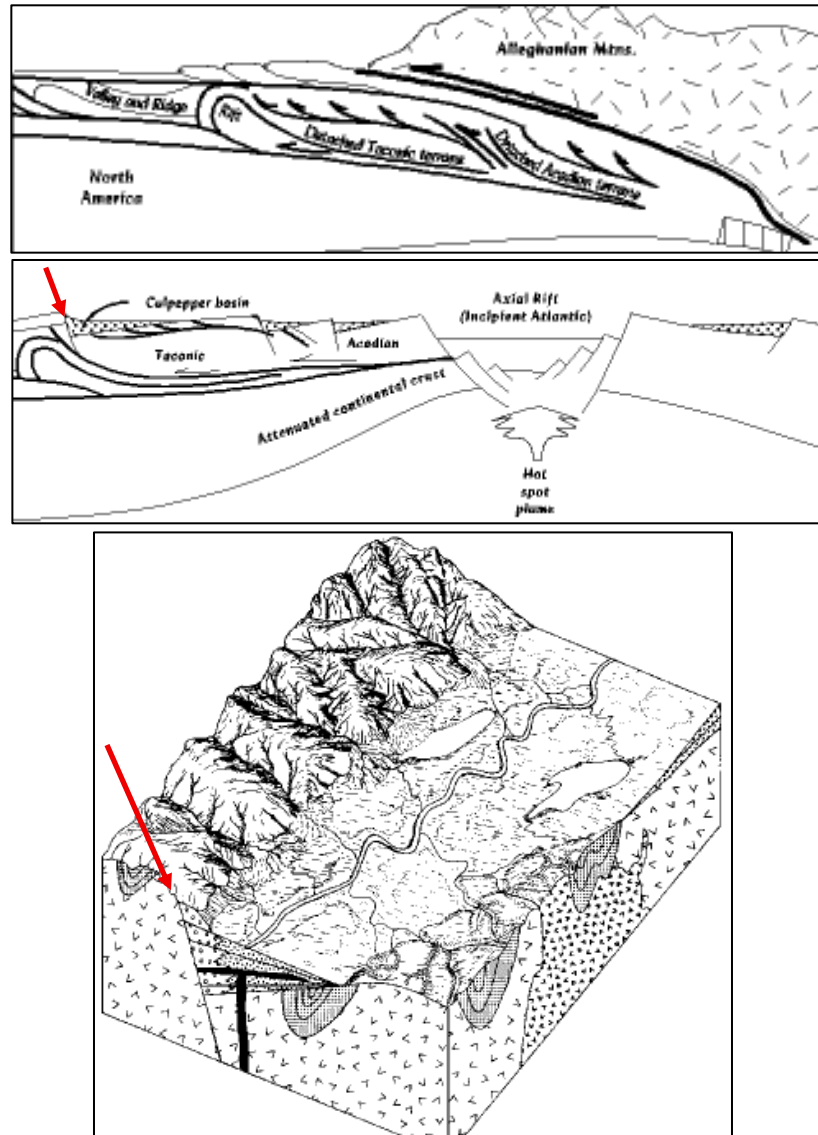


Figure 4—Schematic drawings of tectonic events in our area about 320-175 million years ago. **Top:** The Alleghanian Orogeny about 300 million years ago. As proto-Africa collides with proto-North America, it detaches great sheets of metamorphic bedrock and pushes them inland on thrust faults, shaping the Piedmont as we know it today. **Center:** The breakup of Pangaea beginning about 230 million years ago during the Triassic Period. Magma erupting from a hotspot forms a widening rift zone, origins of the Atlantic Ocean. Parallel inland rifts form the Triassic basins. **Bottom:** Culpeper Basin about 190 million years ago, created by Piedmont rock sliding down a fault line (red arrow). The basin gradually fills with sediments that harden into sedimentary rock, interspersed with igneous rock from periodic flows of lava (black bars). The Vs indicate the crystalline bedrock before rifting began; the dots on the right indicate igneous rock from a magma intrusion. Source: Fichter and Baedke (1999).

green). Ancient rivers laid them down over the Indian Run bedrock during the Cretaceous Period beginning about 140 million years ago. Next came the layer of sediments once known as Tertiary Terraces—the relatively flat areas where streets and homes are built today (fig. 1, bottom, orange). The sediments were laid down over the Potomac Formation during the Neogene Period beginning about 23 million years ago.

That's the geologic backstory. So what do the rocks in Four Mile Run Gorge actually look like?

Four Mile Run Rocks

Indian Run Sedimentary Melange. From where we started at the Long Branch Nature Center (fig. 1, bottom, yellow star), we walked down to the first stream crossing on Long Branch to see a good exposure of the Indian Run bedrock (fig. 5, top).

The name of the rock formation comes from the creek in Fairfax County where it was first described by a geologist (Drake 1985); the term “melange” comes from French *mélange*, “blend.” Indian Run sedimentary melange was metamorphosed from seafloor rock containing sediments of various kinds and sizes. You occasionally find embedded quartz cobble and rock fragments, which submarine turbidity currents caused by landslides mixed into the seafloor clays and silts. The blended sediments hardened into sedimentary seafloor rock, precursor of Indian Run sedimentary melange.

The Indian Run rock is medium gray in color, but a piece knocked off with a rock hammer shows a lighter interior from the rock's abundant white muscovite mica (fig. 5, bottom). The matrix is very fine-grained; individual crystals are visible only with a loupe. Chemical analysis by Drake (1985) showed a preponderance of light-colored muscovite mica, quartz, and plagioclase feldspars (in that order) but with enough green chlorite and black biotite mica mixed in to give the rock its relatively dark color.

The Indian Run bedrock is criss-crossed by what geologists call joints—cracks in the rock (fig. 5, top, red lines and arrows). Tectonic uplift and transport during two orogenies (the Taconian and Alleghanian) uptilted the rock in parallel layers marked by joints crossed by another, near-vertical set of joints. Such cracks can have various causes, including tectonic pressure during mountain building and contraction of the cooling rock following metamorphism. During tectonic uplift, superheated waters circulated through the rock, filling



Figure 5—Indian Run sedimentary melange along Long Branch. *Top:* Bedrock exposure showing near-vertical joints in the rock (red arrows) as well as parallel uptilted joints from tectonic uplift (red lines). *Bottom:* Bedrock fragment knocked off with a rock hammer. Note the heavy mica component (flecks of white muscovite and black biotite) and the contrast with the darker weathered Indian Run bedrock underneath the rock fragment. All photos: Hutch Brown.

some cracks with fluids rich in silica, which precipitated out as veins of solid white quartz.

Cretaceous/Neogene Sediments. On the slope above the bedrock outcrop, we saw an exposure of the overlying Cretaceous sediments in the Potomac Formation (fig. 6). The formation is made up of clays, silts, sands, pebbles, and rounded river rocks laid down by ancient rivers about 140-100 million years ago. The sediments are so tightly packed that they are hard to pick apart, even with a rock hammer, but they are not solid rock. Loosened by erosion, the river rocks fall into local streams, where they make up much of the alluvium.



Figure 6—Potomac Formation exposure under a tree root on a steep slope above Long Branch. Rounded stones, mostly quartz and sedimentary rocks, were deposited onto the Indian Run bedrock by ancient rivers, along with clays, silts, sands, and pebbles.

From the Indian Run bedrock exposure, we continued downstream and turned uphill onto dirt trails leading through the woods. We were now on what geologists informally call the Tertiary Terraces (fig. 1, bottom, orange, Tt3), the relatively flat upland areas where people once farmed and now have suburban homes. Along the trails, we found thin soils with more rounded rocks (fig. 7), evidence that ancient rivers once flowed here too. The rivers deposited the rocks along with silts, sands, and pebbles during the Neogene Period beginning about 23 million years ago.

The geologic map describes the Neogene sediments as “crystalline rocks, quartz, quartzite, and sandstone” (Frost and Ernest 1999), but you can also find finer grained sedimentary rocks like shale and siltstone. The rocks came mostly from Culpeper Basin to the northwest. Many are quartz, some showing reddish or yellowish colors from impurities in the mineral (fig. 7, bottom).

Quartzite in the Cretaceous and Neogene deposits came from the Blue Ridge Province to the west of Culpeper Basin. Some quartzite contains trace fossils dubbed by the geologist who first described them as *Skolithos linearis* (fig. 8). The traces were left by wormlike sea creatures that burrowed into ancient offshore sands. The accumulating sands hardened into sandstone that was altered by metamorphism during the Alleghanian Orogeny. Known as Antietam quartzite, the fossiliferous rocks have eroded out of the ancient riverine sediments and washed onto grav-



Figure 7—Deposits of Neogene sediments along a hillside trail overlooking Long Branch. The rocks are mostly sandstone in various hues. Some are quartz with reddish or yellowish stains from mineral impurities. Arlington has no sandstone or other sedimentary rocks, so the rocks had to come from Culpeper Basin in northwestern Fairfax County and points farther west.

el bars along our local creeks, where nice specimens of *skolithos* are relatively easy to find.



Figure 8—*Skolithos* trace fossils in Antietam quartzite. The rock is part of river deposits from the Neogene Period along a hillside trail overlooking Long Branch.

Isostatic Rebound. But how did rocks laid down by ancient rivers end up on slopes high above our local creeks? The answer has to do with gentle uplift of our area through a tectonic process called [isostasy](#) (isostatic rebound) (fig. 9).

When continents collide, the mountain-building process thickens the continental crust. Most of the thickening crust moves downwards rather than upwards because Earth's solid lithosphere presses down into its viscous asthenosphere. Much like an iceberg, the resulting mountains are only in small part (about 20 percent) exposed; most of the mountain mass is buried deep underground. As the overlying mountains weather away, the downward pressure eases, and the asthenosphere's pushback results in gentle regional uplift, gradually exposing ancient mountain roots over long periods of geologic time.

So the great Alleghanian Mountains that once covered our area are not entirely gone. Due to isostatic rebound, mountains are slowly rising again across our area. Uplift is greatest in the Blue Ridge, but it ex-

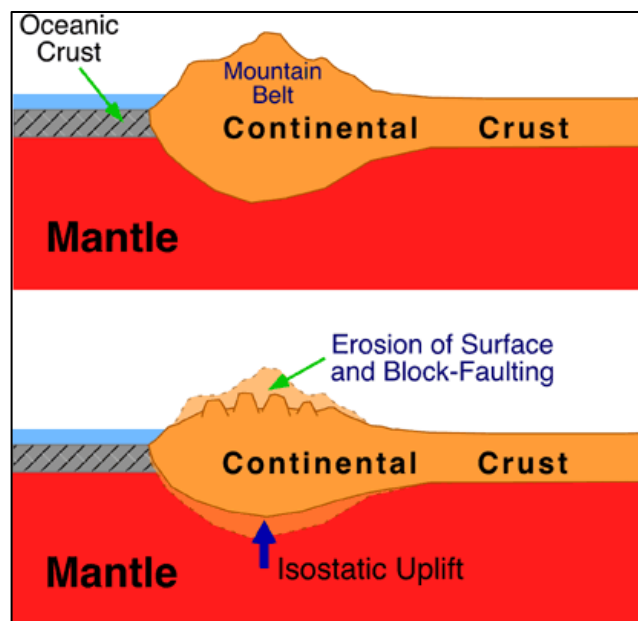


Figure 9—Isostatic uplift following mountain building and erosion. During an orogeny, most of the mountain mass pushes down into Earth's viscous lower mantle (the asthenosphere). Released from the overlying weight after the mountains weather away, the asthenosphere pushes back, and gentle regional uplift exposes ancient mountain roots. Source: Pidwirny (2006).

tends into the Piedmont, where our streams have responded through downcutting. One result is Four Mile Run Gorge, with ancient river rocks left high and dry on the upper slopes.

Huffman's Falls. After viewing the hillside Neogene deposits, we followed dirt trails down to Four Mile Run and Huffman's Falls (fig. 10, top), the highlight of our trip.

The origin of "Huffman" in the name is obscure; AI attributes it to an early colonial family in the area. But the "falls" part is obvious: Four Mile Run drops about 8 feet over the two parts of Huffman's Falls—far enough, following rainstorms, to create a roar that you can hear from the nearby Washington and Old Dominion (W&OD) Trail, a popular biking/walking trail along Four Mile Run.

Huffman's Falls is large enough to share with Great Falls on the Potomac River the signature signs of waterfall wear and tear during floods (fig. 10, bottom). The rock is worn shiny smooth in places, and "pot-holes" have formed where whirlpools have ground away the rock under swirling sands and gravels.



Figure 10—Huffman's Falls. Top: The upper part of the falls drops about 6 feet. **Bottom:** Floodwaters pouring over the falls have smoothed out the granite (left) and dug holes into the rock (right) with scouring sands and gravels.

The weathered bedrock at Huffman's Falls is a lighter gray in color than the surrounding Indian Run sedimentary melange. Years ago, I took this to be variability in the color of the Indian Run bedrock. Nearby Lubber Run, for example, has a brownish Indian Run bedrock, so I assumed that the rock might also come in light gray. I thought the rock at Huffman's Falls was entirely Indian Run sedimentary melange.



Figure 11—Granite outcrop at Huffman's Falls. Top: A distinctive pink patch in the rock is from orthoclase feldspar, common in many granites. **Bottom:** A piece of the granite outcrop broken off with a rock hammer shows a blend of mineral components, including gray quartz, pink orthoclase, white muscovite, and black biotite.

In 2019, I learned otherwise from Joe Marx, a retired geology professor at Northern Virginia Community College. Joe led a geology walk to Huffman's Falls, where he pointed out a distinctive patch of pink in the rock from orthoclase feldspar (fig. 11, top). Orthoclase, typically pink, is absent from the Indian Run bedrock but common in many granites. Joe said that we were looking at a small granite outcrop.

Weathering makes rock types look similar, so breaking off a piece of an outcrop with a rock hammer can make a huge difference. When I broke off a piece of granite at Huffman's Falls (fig. 11, bottom), the interior looked strikingly different from the Indian Run rock (fig. 5, bottom): the crystals were larger in size



Figure 12—Contrasting rock types. Granite at Huffman’s Falls (upper left) is coarser in grain than Indian Run sedimentary melange (lower right). It is also lighter in color, with a pinkish cast from orthoclase feldspar, whereas the Indian Run rock contains more biotite mica, giving it a darker hue. Both rocks are lying on weathered Indian Run sedimentary melange with a white quartz inclusion.

and the rock was lighter in color, with a pinkish cast from orthoclase feldspar. Granite is made up mainly of quartz and feldspars, with less muscovite and biotite mica than in the neighboring Indian Run bedrock. There’s no confusing the two (fig. 12).

Fall Line Zone. In school, I learned that Piedmont rivers and streams typically have waterfalls at the so-called Fall Line, where the water plunges from metamorphic rock onto the softer sedimentary rock of the Coastal Plain. But Arlington County has no sedimentary bedrock on the Coastal Plain or anywhere else. At Huffman’s Falls, Four Mile Run spills from the metamorphic Indian Run sedimentary melange upstream over the granite at the falls onto more Indian Run bedrock downstream. Similarly, the Potomac River at Great Falls pours from Mather Gorge metagraywacke upstream onto the same Mather Gorge metagraywacke downstream.

In fact, the drop in rivers and streams from the Piedmont onto the Coastal Plain is never abrupt: it happens gradually across a zone many miles long. The Potomac River’s Fall Line zone reaches all the way from Great Falls through Little Falls to Theodore Roosevelt Island. Similarly, Huffman’s Falls is part of a Fall Line zone that reaches from well upstream of the falls to well downstream of Columbia Pike.



Figure 13—Quartz veins and nodes in the floodwater-smoothed granite at Huffman’s Falls. More erosion-resistant than the bedrock, the quartz stands out.

Quartz. Quartz veins swirl through the granite at Huffman’s Falls (fig. 13). During tectonic events, superheated fluids circulate through what geologists call the country rock (the preexisting bedrock) where it is intruded and altered by contact with tremendous heat from rising magma. Because quartz has a relatively low melting point, it remains dissolved in the fluids long after other minerals precipitate out. Silica-rich waters fill fissures in the cooling and contracting bedrock, whether igneous or metamorphic, leaving veins and nodes of white quartz, some of them huge.

Quartz is not only one of the most common minerals on Earth but also one of the hardest, with a value of 7 on the Mohs hardness scale. Rocks like granite and Indian Run sedimentary melange are far more erodible than quartz, which drops out of the weathering bedrock as “float” (loose pieces on the ground, from pebbles to boulders in size) and as alluvium on gravel bars. More erosion-resistant than sandstone and other rounded river rocks, quartz is ubiquitous in the alluvium of Four Mile Run Gorge.



Figure 14—Stones quarried from the Indian Run bedrock make up the roadbed for the historic Washington and Old Dominion Railroad, a prime example of 19th-century engineering, visible at Huffman's Falls.

A Geology Tableau and More

Glencarlyn Park has more to see than just geology. The W&OD Trail, for example, was built on the roadbed of the historic W&OD Railroad along Four Mile Run, which carried mail, freight, and passengers from Alexandria to as far as Bluemont in Loudoun County from 1847 to 1968. During the Civil War (1861-65), the railroad was important enough for Union troops to protect it and Confederate raiders to attack it. Easily seen from Huffman's Falls (fig. 14), the roadbed is a prime example of 19th-century engineering using stones quarried from the Indian Run bedrock downstream from the falls.

On the way back to the Long Branch Nature Center, we stopped to see a rare shoot of American chestnut (*Castanea dentata*). Chestnut was once a major forest tree in our area, but Japanese chestnuts imported in 1904 for horticultural purposes contained a fungus called chestnut blight (*Cryphonectria parasitica*). Spread by windborne spores, the fungus infested American chestnut stands, killing them across their entire range. By the mid-1950s, the American chestnut was all but gone. (Asian chestnuts are resistant to the fungus.)

But old root systems still send up chestnut shoots that you can find in our local woods (fig. 15). They rarely grow more than a foot or two before the blight penetrates the bark and kills them. The shoot we saw was on the edge of the native old-growth forest, next to a

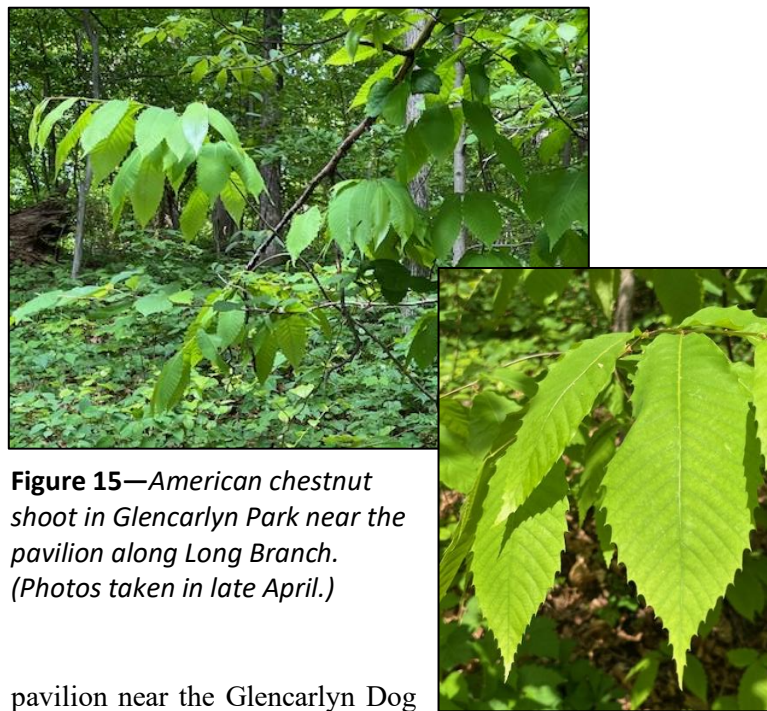


Figure 15—American chestnut shoot in Glencarlyn Park near the pavilion along Long Branch. (Photos taken in late April.)

pavilion near the Glencarlyn Dog Park. You can see it yourself (if it's still alive); about 4 feet high, the chestnut shoot is to the left of a no parking sign just uphill from a patch of poison ivy. ↗

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June 2026—Upcoming Events in Our Area/Region (see details below)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 NVMC mtg	2	3 MSDC mtg	4	5	6 Show: Colfax, NC
7	8	9	10	11	12 Show: W Friendship, MD	13 Show: W Friendship, MD; NVMC field trip
14 Show: W Friendship, MD	15 GLMSMC mtg	16	17	18	19	20
21	22 MNCA mtg?	23	24 MNCA mtg?	25	26	27 NVMC field trip
28	29	30				

Event Details

1: Dunn Loring, VA—Northern Virginia Mineral Club; info: <https://www.novamineralclub.org/>.

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

6: Colfax, NC—Annual show; Forsyth Gem and Mineral Club; Piedmont Triad Farmers Market, 2914 Sandy Ridge Rd; Sat 9-5; free admission/parking; info: Amber Shelton, 336-688-9729, 519ashelton@gmail.com

12-14: W. Friendship, MD—Annual show; Chesapeake Gem and Mineral Society; Howard County Fairgrounds, 2210 Fairgrounds Rd; Fri 12-6, Sat 10-5, Sun 11-4; \$6 adults, kids 12/under free; info: Tamie Simpson, 810-919-4386, eventcoordinator@gem-show.com.

13: Mt Pleasant, PA—Collecting trip at National Limestone Quarry; info: Katy Johnson, fieldtrips@novamineralclub.com.

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

22/24?: Burke, VA—Micromineralogists of the National Capital Area (meeting date varies based on room availability); info: <http://www.dcmicrominerals.org/>.

27: Rockville, MD—Collecting trip at Amrize Quarry (old Travilah quarry); info: Katy Johnson, fieldtrips@novamineralclub.com.

The Northern Virginia Mineral Club, Inc.

Visitors are always welcome at our club meetings!

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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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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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