



The Mineral Newsletter

May Meeting: Canceled

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



Xenotime *with rutile*
Novo Horizonte, Bahia, Brazil

Source: Wikipedia; photo: Robert M. Lavinsky.

Volume 61, No. 5

May 2020

Explore our [website!](#)

Spring auction canceled

Our meeting room is closed for
May—details on page 6

In this issue ...

Mineral of the month: Xenotime	p. 2
Reflections from the President.....	p. 5
May program canceled.....	p. 6
EFMLS : Safety matters—COVID-19	p. 6
Bench tip: Using small drills.....	p. 7
EFMLS : News briefs	p. 7
Exploring a fossil treasure trove.....	p. 8
Smallest dinosaur ever fossil found.....	p. 8
Anthill sands	p. 9
EFMLS : Links to explore.....	p. 9
AFMS : Jargon alert	p. 10
Rock collector jargon	p. 11
Garnet-bearing feldspar	p. 13
Upcoming events (<i>not much</i>)	p. 15

Note!

Coronavirus transmission remains a high risk. The May NVMC meeting is therefore canceled.



Mineral of the Month Xenotime

by Sue Marcus

Some minerals are named for their discoverer; others for the person who described them. May's mineral, xenotime, was named by a rather spiteful mineralogist chastising another scientist.

Name

The original material was found in a pegmatite at Hidra, Flekkefjord, Norway by Norse mineralogist Nils Otto Tank. It was initially described in 1824 as *Phosphorsyrad Ytterjord* by Swedish chemist Jöns Jacob Berzelius, who thought that it contained a new element, yttrium. In fact, yttrium had already been identified in 1794.

In 1831, Ernst Friedrich Glocker, a German mineralogist, called it *Ytterspath*. If you are noting the "ytter" theme here, it is due to the element yttrium found in this mineral.

"Kenotime" was the moniker bestowed on the mineral in 1832 by French mineralogist Francois Sulpice Beudant. Referring to the purported discovery of yttrium by Berzelius, Beudant used the Greek words κενός and τιμή ("vain" and "honor") to call attention to Berzelius's vanity in mistakenly thinking he had discovered yttrium. "Kenotime" became "xenotime" over time, probably due to misreadings of handwriting.

Just when the reader of this article (and its writer) thought we were through with the name, we learn that late-20th-century mineralogists discovered a new mineral in Manitoba that has the same chemistry as xenotime, though with ytterbium in place of yttrium. In other words, they are polymorphs. So the original xenotime became xenotime-(Y) and the new version with ytterbium is xenotime-(Yb).

Formation

Xenotime is found in igneous rocks, with crystals of interest to collectors usually coming from pegmatites. In metamorphic rocks, xenotime occurs in gneiss with garnets and biotite. Xenotime in igneous and metamorphic rocks can erode into placer deposits with other minerals, forming dark sands. When the sands are buried and lithified (becoming rock) due to temperatures and pressures deep within the Earth, xeno-

Happy May Day!



Northern Virginia Mineral Club members,

The [Long Branch Nature Center](#) where our club meets is temporarily closed. Our club meeting scheduled for May 18 is therefore canceled.



Xenotime, Zagi Mountain, Northwest Frontier Province, Pakistan. Photo: Bob Cooke.

time becomes a constituent of sedimentary rock. Xenotime resists erosion and other forms of destruction (heat and pressure), so it can be useful for age-dating sedimentary rocks that contain it. Small amounts of uranium or thorium in xenotime can make



Xenotime, Trimouns Talc Mine, Luzenac, Ariège, Occitanie, France. Source: Mindat.

it radioactive. Transparent and translucent xenotime crystals may show changes in color from artificial light to natural light.

Localities

Fine xenotime crystals are not abundant anywhere, and they are relatively unusual in mineral collections. Micromounters alert! Transparent xenotime crystals (like the specimen above) are beautiful and rarely larger than a few millimeters. Here's a chance for micromounters to show off their rarities to the rest of us—if you can find a specimen.

Several famous pegmatite localities around the world have produced attractive xenotime crystals, including pegmatites in Bahia, Brazil, Mount Malosa, Malawi, and Zagi Mountain, Pakistan; and alpine pegmatites in Italy, France, Austria, and Switzerland. A claim to the largest xenotime *crystal* specimen is made for one measuring 5 by 3.8 centimeters (about 2 by 1.5 inches) from Zagi Mountain, Pakistan, shown on the Mindat website. Pakistan and Brazil seem to have produced other euhedral macro (that is nonmicro) crystals that are usually opaque (like the specimen on the cover). Xenotime is also found in Norway as opaque macrocrystals, less well formed than those from Pakistan or Brazil.

Colorado pegmatites have also been the source of xenotime crystals, though not in marketable quantities. The Big Berta Mine in Jefferson County may have been the best locality for Colorado xenotime crystals; for size, however, the largest U.S. specimen may be an 11-centimeter (about 4-inch) anhedral mass found at the Clora May Mine in Chaffee County in 2010.

This is not a comprehensive account of all xenotime occurrences, just some of the ones that have produced attractive crystals or notably large specimens.

Extraction and Uses

The places where xenotime is extracted are not the localities known for mineral specimens. This is due to the geologic environments in which exploitable xenotime occurs.

Unconsolidated sands and soils in Malaysia's Kinta Valley have been mined for the tin in cassiterite since ancient times. More recently, the xenotime found in them was a source of exploitable yttrium, although the yttrium was difficult to process.

Xenotime occurs at the unusual, rare-earth-rich Duncan section of the Mount Weld deposit in Australia. However, no specimens of *any* minerals are reported from that deposit. Mount Weld is a carbonatite—that is, an igneous rock primarily composed of carbonate



Xenotime, Mt. Malosa, Zomba District, Malawi. Source: Wikipedia; photo: Christian Rewitzer.



*Xenotime, Hitterö, Norway.
Source: Wikimedia; photo: Elke Wetzig.*

minerals. Xenotime is also found in other Australian rare-earth deposits, though not as specimen material. China's Guangdong Province seems to be another source of commercial production but no specimens.

Like most rare earths, yttrium is used in phosphors, although the main use is in high-temperature ceramics. Phosphors provide the nuanced lighting and colors in all of our electronic screens, including phones, televisions, and computers. Jet engines and the oxygen sensors in cars are examples of ceramic coatings containing yttrium. Yttrium is also used in medical and dental lasers.

Xenotime is seldom cut into gemstones. When it is, it is an oddity rather than a precious stone. Faceted xenotime is not particularly attractive. It looks like faceted, translucent reddish carnelian or translucent honey-colored amber.

Play Scrabble®? Xenotime could be a great word to remember!

Technical Details

Chemical formula $\text{Y}(\text{PO}_4)$
 Crystal form Tetragonal
 Hardness 4–5
 Specific gravity 4.4–5.1
 Color Shades of yellow through brown, sometimes with shades of red; gray (color descriptions lean towards food and drink: champagne, chocolate, cognac)

Streak Yellow-brown, white
 Cleavage One perfect
 Fracture Uneven, splintery
 Luster Vitreous, resinous

Sources

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*Xenotime, Mt. Malosa, Zomba District, Malawi.
Source: Mindat.*



Reflections From the President

by Sue Marcus, standing in for Tom Burke

In this most abnormal of times, I'll contribute to the abnormality. President Tom is ill, and Vice President Ti is valiantly laboring to keep people safe as an EMT (emergency medical technician). So, like many other things in life-during-pandemic, you get a substitute.

You are staying home and working on your mineral or fossil collection, right? Organizing, labeling, maybe identifying items to put up for auction when we get together in person? That's my goal, and I've done some of it. With years of collecting come years of pent-up needs for organizing.

Have you discovered online mineral auctions? Or checked online sites linked to eBay for minerals or fossils? Lots of ways to part you from your stimulus money!

One caution, based on my personal mis-experience: look carefully at the size of the specimens offered for sale *before* you make a purchase! I've gotten a couple of gorgeous specimens—because the online photos were very well done and taken at very close range. I hadn't looked at the size of the specimen and found the lovely white grossular crystals with green centers from the Jeffrey Quarry in Quebec were just as described. And I couldn't see the green centers with my naked eyes.

One skill I need to learn is to photograph specimens. Good lighting is important, as is a flat surface, which is difficult to find in our house. Learning to take better mineral photos is a goal for me, and there is no better time than now.

What are your hobby goals? What are you doing to make them happen?

There are many sources of online science activities for all ages. Just search for "free science activities." Here are some to get you started:

Geology:

<https://www.earthsciweek.org/classroom-activities>

<https://www.sciencekids.co.nz/>

(from New Zealand, so watch the spelling!)

https://serc.carleton.edu/NAGTWorkshops/online/lab_activities.html

(minerals, rocks, and fossils in this one)

Others:

<https://www.si.edu/kids>

<https://www.si.edu/learn-explore>

<https://ssec.si.edu/game-center>

<https://learninglab.si.edu/>

Make the days pass easily by being thoughtful and kind to others—and having fun with our hobby.

Wishing each and all of you good health!

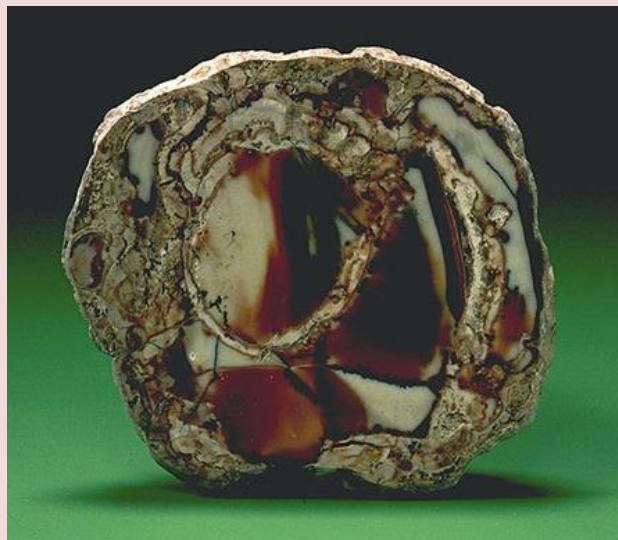
Sue

Origin of Thundereggs

This account, adapted from an online source, is loosely related to American Indian origin stories in the Pacific Northwest.

Thunder Spirits lived on snow-capped Mount Hood and Mount Jefferson in the Pacific Northwest, where they stole eggs from the nests of the Thunder Birds. When the Thunder Spirits became angry, they would cause violent thunderstorms, hurling the spherical rocks at each other and covering Oregon's landscapes with Thunder Eggs.

Source: [Nature of the Northwest](#)



May Meeting Canceled

May 18, 2020

The NVMC meeting scheduled for May is canceled because our meeting facility, the Long Branch Nature Center in Arlington, VA, will be closed. For details, click [here](#).

Everybody stay safe! ➤

April Meeting Canceled—No Minutes

April 27, 2020

The NVMC meeting in April was canceled due to the risk of transmitting the novel coronavirus, which meant that our meeting facility was closed. The program on painting rocks by Linda Benedict will be rescheduled for a future meeting. ➤



Safety Matters

COVID-19

by Ellery Borow, EFMLS Safety Chair

Editor's note: The article is adapted from EFMLS News (April 2020), p. 4.



Pulling together to accomplish club goals is what we do. Shows, field trips, educational programs, and all manner of activities require a good deal of preparatory effort.

A new common activity now faces us. When a twister comes, we head to the shelter before it reaches us. With a flood, we head to high ground before the roads are inundated. In this instance, we need to prepare for a virus before it overwhelms our community.

The problems associated with the coronavirus disease of 2019, or COVID-19, are nationwide—indeed, worldwide. As responsible rockhounds and club members, we should become part of the solution rather than the problem. We do, after all, think of ourselves as leaders.

Much information is circulating about the pandemic—some sound, some rumor. Because the

facts are still coming in, we need the most accurate information available to stay safe. Reputable and trusted sources on COVID-19 include the World Health Organization, the Centers for Disease Control and Prevention (CDC), and the National Institutes of Health. Checking these sources, plus your state and local sources, will give you the most current information.

Here is a not-so-short list of activities for staying safe, as of this writing:

- Check reputable sources to stay informed. The [CDC website](#) is a good source.
- Watch for symptoms like dry cough, fever, exhaustion, chest pains (respiratory distress), and shortness of breath. Other symptoms to watch for include loss of sense of smell and gastrointestinal unease.
- People infected with COVID-19 might not realize that they have the virus until symptoms show up, so take all pertinent precautions. Communication and community involvement are keys to success.
- If you have the symptoms or suspect that you might have been in contact with the virus, contact your healthcare provider, clinic, or hospital. They might suggest a visit or some other course of action. Contacting healthcare providers before you go anywhere lets them prepare for a visit, if warranted. You don't want to spread virus to others unintentionally, especially in a doctor's office or other healthcare facility where patients might already be in poor health.
- COVID-19 transmission appears to be primarily through respiration, so keep a physical distance from others. Six feet is the recommended minimum, with 10 feet preferred.
- Many healthcare professionals recommend avoiding gatherings. Recommended numbers to avoid have fallen from 250 people, to 100, to 50, to 10, to as few as 2. Use your commonsense.

- In certain instances, a suitable face mask is warranted. A well-fitted N-95 mask appears to help prevent transmission. (Note the words “well fitted”—beards impair a good fit.)
- In certain instances, gloves are warranted.
- Although respiration is thought to be the primary means of coronavirus transmission, it is wise to keep from rubbing your face, especially your eyes, nose, and mouth.
- Although older people appear to be most vulnerable to the virus, anyone can suffer serious effects. Compromised immune and respiratory systems are particularly vulnerable, but even healthy people can suffer serious consequences. The latest reported mortality rate is from 5 to 25 times the mortality rate of the average flu.
- There is neither a vaccine nor a known treatment for COVID-19. Testing is underway, but we can’t expect to see a vaccine before next year, and estimates for making a safe and effective treatment available range from late fall 2020 to summer 2021.
- If you think you might be infected and testing is available, use it. But it might take days after exposure to the virus for it to replicate enough for the test to detect it.
- Doctors suggest keeping a good diet, getting sufficient sleep, exercising periodically, and obtaining a flu shot. Again, use your commonsense.
- Frequently wash your hands for 20 seconds with soap and flowing water. This helps keep the virus from your eyes, nose, and mouth if you touch your face. If you can’t wash your hands, use a hand sanitizer with a high alcohol content.

Please remain vigilant—your safety matters.

Disclaimer: This article does not profess to offer medical advice but merely compiles data about COVID-19. For more information, please check trusted sources. ↗

Bench Tip **Problems With Small Drills**

Brad Smith

Drilling small holes can be a problem. With drills that are less than 1 millimeter (18 gauge or 0.040 inches), some chucks will not tighten down well enough to hold the drill securely.

The problem is easily solved, either with a chuck adapter or by buying your small drills with a 3/32-inch shank size. Either way, you have a large shank gripped in your drill press, Foredom, or Dremel, so changing bits is fast and easy.

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



EFMLS News Briefs

Editor’s note: The items are adapted from EFMLS News (April 2020), p. 1.

Due to the coronavirus, the 2020 EFMLS Convention scheduled for March 27–30, 2020, has been postponed until October 23–25, 2020. More details to come!

Wildacres closed in April. If it closes again in May, there will be plenty of time to notify registrants and refund fees. If that happens, let’s hope that we all stay well and can keep working on our hobbies at home.

Our gratitude, thanks, and appreciation go out to all our first responders, medical personnel, truckers, grocery and pharmacy workers, and everyone else who is risking their lives for us, many of whom belong to our clubs. We owe them all a huge debt of gratitude! ↗

Ghosts of the Future

by Sarah Kaplan

Editor's note: Adapted from the Washington Post (6 December 2019). Thanks to Sue Marcus for the reference!

A massive Canadian treasure trove reminds us how fleeting life on Earth can be—and how much peril we're in.

If the history of Earth is condensed to fit into a single 24-hour day, life emerges sometime before dawn. Photosynthesis evolves around midmorning, and the atmosphere becomes oxygen rich right before lunch. But most of the day is utterly boring; all organisms are microscopic and occupied with little more than belching gasses and oozing slime.

It isn't until 9 p.m., about half a billion years ago, that we see the first complex, multicellular beings. Scientists call this juncture the “Cambrian explosion”—the moment when billions of years of bacteria gave way to the rapidly evolving beings we know as animals. This evolutionary burst is responsible for every elephant, every fly, every bow-legged amphibian and wriggling worm, every complex creature that ever walked, swam, flew, or scurried on this Earth. And I'm about to witness it firsthand.

“Ready to go back in time?” asks Ardelle Hynes, a cheerful, pony-tailed ranger at Yoho National Park in British Columbia. ... [Read more.](#) ↗

Smallest Ever Fossil Dinosaur Found Trapped in Amber

by Michael Greshko

Editor's note: Adapted from National Geographic (11 March 2020). Thanks to Sue Marcus for the reference!

The little birdlike dinosaur *Oculudentavis khaungraae* probably dined on insects in a Cretaceous rainforest.

A spectacular new amber fossil from Myanmar holds the skull of the smallest prehistoric dino-



Trilobite fossil in Burgess shale, Yoho National Park, British Columbia.

saur ever found: a birdlike creature that lived 99 million years ago and grew no bigger than the smallest birds alive today.

The fossil, described in the journal *Nature*, measures just 1.5 centimeters long from the back of the head to the tip of the snout, about the width of a thumbnail. The skull's proportions suggest that the animal was about the same size as a bee hummingbird, which would have made the newfound dinosaur lighter than a dime. ... [Read more.](#) ↗



Tiny birdlike dinosaur fossil trapped in amber.

Anthill Sands

by William Beiriger

Editor's note: Adapted from Livermore Lithophiles (newsletter of the Livermore Valley Lithophiles, Livermore, CA), July 2009, p. 4.

If you look at anthills, you might be surprised to find small crystals on the ground surrounding the entrance to the nest. While excavating their nests, ants bring coarse materials to the surface.

Along the Pecos River near Roswell, NM, I collected small doubly terminated quartz crystals, locally known as Pecos diamonds. I put sand from around the nest entrance into a bag, trying not to collect any ants. I washed the sand and found Pecos diamonds ranging in size from 1 to 3 millimeters.

I hope to collect anthill sands near Bakersfield, CA, an area that contains sharks' teeth from the Miocene Epoch 10–15 million years ago. I anticipate having a good chance of finding very small sharks' teeth. ↗



Quartz crystals ("Pecos diamonds") mixed in with other materials excavated by ants from a nest near Roswell, NM.

GeoWord of the Day

(from the American Geoscience Institute)

bulk density

The weight of an object or material divided by its volume, including pore spaces and *in situ* moisture. It is identified as dry density for the weight per unit volume of a soil mass that has been oven-dried to a constant weight at 105 °C.

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



Links To Explore

Editor's note: The item is adapted from EFMLS News (January 2020), p. 6.

The following links contain information related to our hobby. If you have a favorite link, please send it to efmlsnews.editor@gmail.com.

American Federation of Mineralogical Societies:

www.amfed.org

American Lands Access Association:

www.amlands.org

American Geological Institute:

www.americangeosciences.org

Gemological Institute of America:

www.gia.edu

Mineralogical Society of America:

www.minsocam.org

Mindat.org (mines, minerals, and more):

<https://www.mindat.org/>

National Speleological Society:

www.caves.org

Smithsonian Magazine Smartnews:

www.smithsonianmag.com/smartnews

Society of American Silversmiths (care of silver, glossary of silversmithing terms and tools):

www.silversmithing.com

U.S. Geological Survey (information on earthquakes, water, volcanoes, landslides, and so on):

www.usgs.gov

WebSightings from the Maryland Geological Society (articles on paleontology and geology):

www.ecphora.net/mgs/new_interesting_articles.html



Jargon Alert

by Rick Kennedy

Editor's note: The article is adapted from A.F.M.S. Newsletter (April 2020), p. 2.

Many of us have been involved in the hobby or members of a club long enough to develop our own language, sets of terms that don't make a lot of sense to the outside world. It is a shared language, our own kind of "secret handshake." When we use this language among ourselves, it feeds and strengthens our community.

However, when a system is not in place to explain terms to someone new to our hobby (who might be shy and a bit afraid to be the only person not in on a joke), that same shared language can have a very unwelcoming effect.

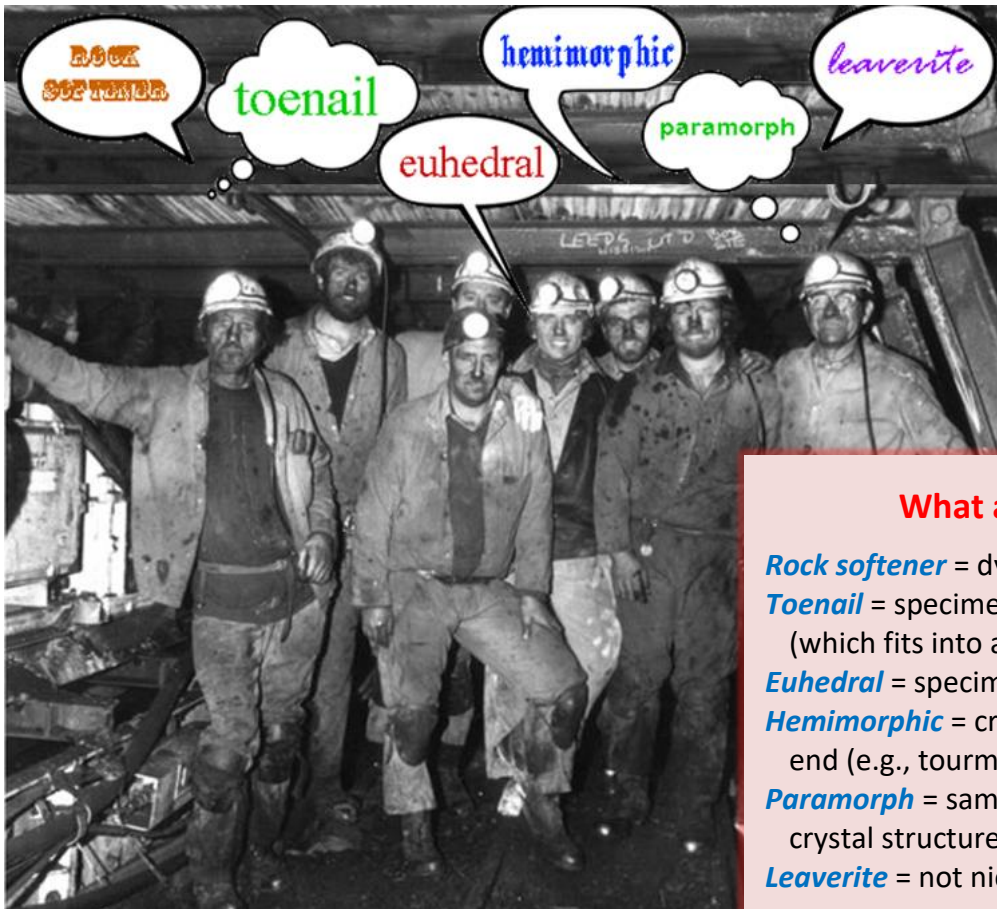
I belong to an organization that has come up with a great way of dealing with this issue. At the beginning of our meetings, the leader announces that if there is

any word or term that does not make sense, members should shout out "Jargon alert!" Then the speaker must pause and explain the obscure term. This leads to better understanding and fosters better community.

One last thing: many people need help identifying rocks and minerals. It is one of the foremost reasons they initially come to club meetings. By definition, they are inexperienced and likely not discerning collectors yet.

As a club, it is our job not just to help them identify things, but to do so kindly and patiently. New people will pick up anything that catches their eye or looks different, and there is nothing wrong with that. We have knowledge they don't, and if we want to be welcoming, we will be careful what we say.

Calling our own collecting mistakes "leaverite," for example, leads to good-natured humor. But giving the same name to someone else's finds can easily come across as insulting, especially if they are new to the hobby and are still learning. ↗



What are these guys saying?

Rock softener = dynamite

Toenail = specimen slightly larger than a thumbnail (which fits into a 1.25-square-inch box)

Euhedral = specimen has fully developed crystal form

Hemimorphic = crystal with different shapes at each end (e.g., tourmaline)

Paramorph = same chemical composition, different crystal structures (e.g., calcite & aragonite—CaCO₃)

Leaverite = not nice enough to take home

From: Tim Jokela, Jr., "[Rock Collector Jargon](#)" (2016).

Rock Collector Jargon

Editor's note: The list is based on Tim Jokela, Jr., "[Rock Collector Jargon](#)" (2016). I put it together as a reference for people like me.

Acicular: Elongated, needlelike crystals (e.g., millerite, natrolite).

Anhedral: Specimen composed of mineral grains with no crystal form (opposite of euhedral).

Botryoidal: Bumpy, grapelike mineral form (e.g., malachite, hematite).

Cab, cabachon, cabbing: A polished stone, usually domed with a flat back, used in jewelry; cabbing is the art of making cabs or cabachons.

Ding: Small point of damage on a crystal, possibly decreasing its value or appeal.

Druse, drusy: Coating of tightly packed crystals, usually tiny, as in "drusy quartz."

Euhedral: Specimen showing fully developed crystal form (opposite of anhedral); collector piece.

Flat: Shallow cardboard trays with dividers, used for storing, transporting, and selling minerals.

Fluorescent: Material that produces light in various colors when bombarded with photons. Some 500 minerals fluoresce under ultraviolet light.

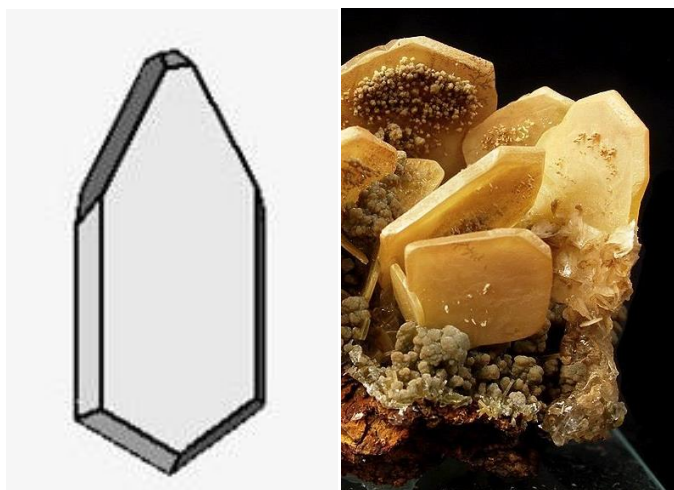
Geode: Hollow spherical structure lined with inwardly projecting crystals.

Hardness: Relative hardness of minerals on the Mohs scale of 1 (talc) to 10 (diamond).

HCL: Hydrochloric acid, used to test for carbonate and to remove carbonates from specimens.



Herkimer diamond with acicular sulfide inclusions, collected in New York in 1992. Source: [Herkimer History.com](#).



Hemimorphic crystal form, with wulfenite as an example.

Hemimorphic: Crystal with different terminations on each end (e.g., tourmaline, wulfenite).

Herkimer diamond: Clear quartz crystals found near Herkimer, NY, often diamondlike, with flat and lustrous faces and a nice sparkle.

Idonnoite: What you call a mineral when you don't know what it is. ("I dunno.")

Inclusion: One mineral grown inside another, such as pyrite within quartz; can also be a liquid or gas. Desirable to collectors.

Keystone, double keystone: Minerals, fossils, or gems sold at half the sticker price; "double" is 75 percent off.

Leaverite: What you call a specimen you don't want to keep. ("Just leave 'er be.")

Locality, type locality: Place where a mineral is or was found; "type" is where the mineral was originally found when first described.

Loupe: Low-power magnifying lens, usually folding, used in examining rocks and minerals.

LW, longwave: Longwave ultraviolet light, used to see certain kinds of fluorescence in minerals.

Macro: A specimen between a micro and a thumbnail in size, not quite either.

Matrix: The rock a mineral formed on, valued for its visual contrast and for the information it gives.

Micro, micromount: Specimen requiring magnification for viewing, mounted and kept inside a small (0.75-square-inch) box.

Min, miniature: Specimen about 2 inches in size.

Native element: One of about 30 elements found pure and in a nongaseous state in nature (e.g., gold).

Oxalic acid: Use to clean specimens by removing iron stains.

Paramorph: Minerals with the same chemical composition but different crystal structures (e.g., calcite and aragonite (both calcium carbonate)).

Pegmatite: Very coarse-grained, slow-cooling igneous rock, usually occurring in veins; slow cooling allows large crystals to form in open pockets.

Pseudomorph: One mineral replacing the other but retaining the form of the replaced mineral (e.g., quartz ps. after wulfenite).

Rare earth, rare earths: Rocks, soils, and minerals containing any of 15 relatively rare elements; can be commercially valuable.

Rutilated: Specimen with inclusions of acicular needles of rutile (e.g., rutilated quartz).

Scepter crystal: A symmetrical capping or overgrowth of a thicker crystal on the tip of a thinner crystal; quartz has the best examples.

Silver pick: Buying minerals (as opposed to self-collecting in the field).

Subhedral: Specimen showing only traces of crystal form (as opposed to euhedral).

SW, shortwave: Shortwave ultraviolet light, used to see certain kinds of fluorescence in minerals.

Termination: The end of a crystal, preferably with faces prized by a collector.

Thunderegg: A roughly spherical solid nodule, usually of agate and often with colorful patterns.

Thumbnail: Specimen that fits inside a 1.25-square-inch box.

Toenail: Specimen between a thumbnail and a miniature in size.

Tumble: Polishing stones with abrasive grits, usually in a barrel.

Twin: Crystals intergrown in a fixed relationship, with the same faces and angles.

UV: Ultraviolet light, used to see fluorescence in minerals.

Vug: An irregular hole in rock, sometimes containing crystals sought by collectors. ➤



Top: Native gold on quartz matrix, Eagles Nest Mine, Placer County, CA.

Bottom: Thundereggs, Friday Ranch, Jefferson County, OR.

Source: Wikipedia.



The Rocks Beneath Our Feet Garnet-Bearing Feldspar in Virginia

by Hunter Thurmond

Editor's note: The article is adapted from The Virginia Pen (newsletter of the Gem and Mineral Society of the Virginia Peninsula), March 2020, pp. 11–12.

Feldspar is a common mineral in Virginia's Piedmont, yet it is found statewide because of its use as crushed stone in various types of construction.

Mineralogy

According to the Virginia Division of Geology and Mineral Resources, feldspar has a “general chemical formula of $x\text{Al}(\text{Al},\text{Si})_3\text{O}_8$, where x can be sodium (Na) and/or calcium (Ca) and/or potassium (K).” Because feldspar forms in an aluminum-rich environment, it is often found associated with garnets.

Feldspar has two solid solution series (fig. 1), alkali and plagioclase. Solid solution series are the mineral stages that the feldspar goes through as it cools from the liquid magma that forms it and other igneous rocks.

It's a little like making rock candy: sugar dissolved in hot water precipitates (or crystallizes) into rock candy as the liquid cools.

The alkali and plagioclase series of feldspar both include albite, which can be of gem quality. (The plagioclase series also contains the desirable mineral labradorite.)

Albite and other feldspars can form with garnets. For example, if hot magma contains the aluminum, sili-



Garnet found on feldspar (albite) in a landscaping project.

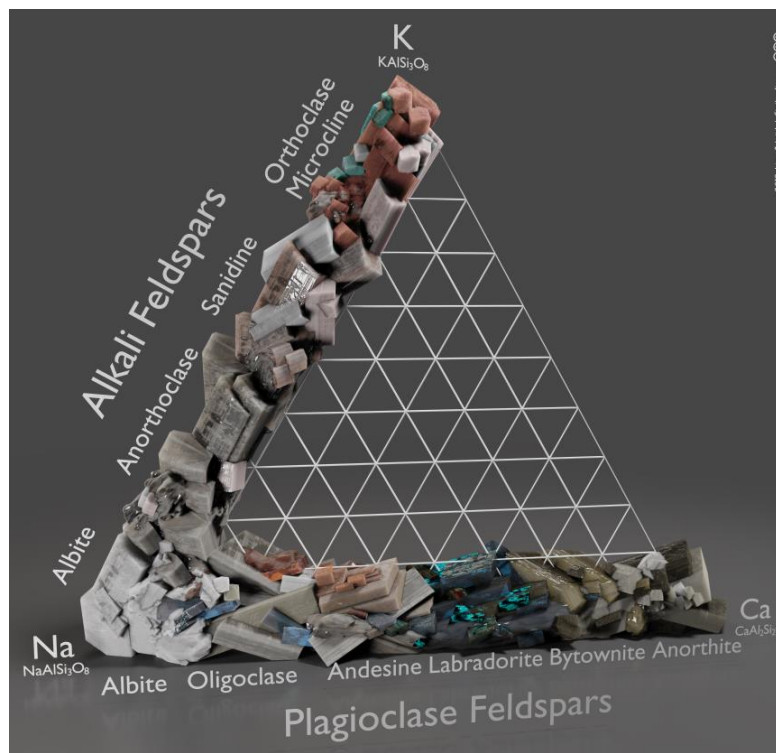


Figure 1—Feldspars are in two mineral series (alkali and plagioclase), depending on the relative amounts of potassium and calcium, respectively, in their chemical compositions. Source: Strike-dip.com (n.d.).

con, and oxygen required for both feldspar and garnets—and if it also contains sodium (for feldspar) and manganese (for garnets)—then both albite feldspar ($\text{NaAlSi}_3\text{O}_8$) and spessartine garnets ($\text{Mn}_3\text{Al}_2\text{Si}_3\text{O}_{12}$) can crystallize as the magma cools.

Mining History

According to the Virginia Division of Geology and Mineral Resources, the first known mining of feldspar in Virginia took place in the 1880s in Amelia County southwest of Richmond. The pegmatites there are the same ones mined at the famous Morefield Mine (please reopen soon!).

Pegmatite feldspar mines are known for their large crystals and colorful microcline feldspar. Many large spessartine garnets have been found at the Rutherford Mines in Amelia County, now closed. The large crystal size is due to slow cooling of the magma, forming pegmatites.

According to the Virginia Division of Geology and Mineral Resources, “Feldspar is also mined from the Roseland anorthosite body at the Piney River Quarry in Amherst County by Boxley Materials Company for

use as aggregate.” Anorthosite deposits have less iron and magnesium, so almandine and spessartine garnets are less common. Scientists are still unsure how anorthosites form, but they believe that plagioclase and other crystals float to the top of hot magma deposits as they cool.

Feldspar in Construction

According to Wikipedia, aggregate “is a broad category of coarse to medium grained particulate material used in construction,” including crushed stone. Because feldspar is used as crushed stone in construction, Amherst County feldspar makes its way all over Virginia through various construction projects—and so do any associated garnets.

The garnets are so rare or tiny that finding them depends on clues, not on digging or searching. (Please stay clear of any and all active construction projects!) Feldspar, mica, quartz, and garnets often form together, so if you see two of them together, then look for the third and fourth. If you see a feldspar with mica inclusions, for example, then look for garnets!

Associated Garnets

Garnets in the almandine-spessartine solid solution series are the type often associated with Virginia feldspars. According to Strike-dip.com, garnets are a “great group of silicate minerals” with the general chemical formula $x_3y_2Si_3O_{12}$, where x stands for calcium, magnesium, iron, and/or manganese and y stands for aluminum, iron, and/or chromium. Depending on their chemical composition, garnets are in the solid solution series shown in figure 2.

The pyralpsite group of garnets—which contains pyrope, almandine, and spessartine garnets—has aluminum in the y position and is associated with feldspar.



Garnets on feldspar found on a parking lot island.

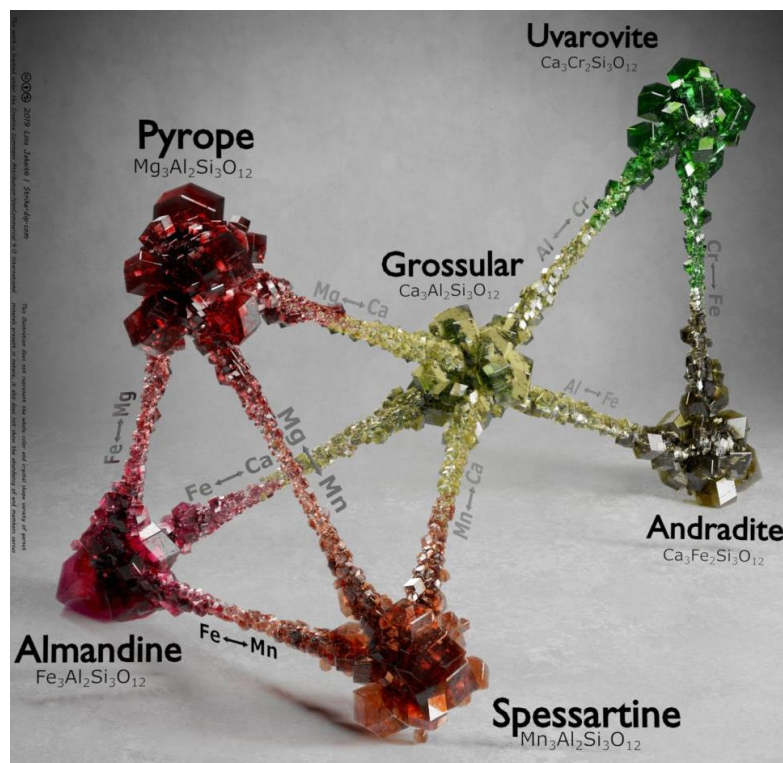


Figure 2—Types of garnet, their chemical compositions, and their relationships in solid solution series. Source: Strike-dip.com (n.d.).

The difference between almandine and spessartine garnets is their relative iron and manganese content in the x position. Iron gives almandine garnets a vivid red coloration, and manganese imparts an orange color to spessartine. ➤

Sources

Strike-dip.com. N.d. (no date). [Garnets](#).

Division of Geology and Mineral Resources. 2015. [Feldspar](#).

Wikipedia. N.d. [Construction aggregate](#).

How to Write Good

Avoid clichés like the plague. (They’re old hat.)

Avoid ampersands & abbreviations, etc.

Contractions aren’t appropriate.

Foreign words and phrases are not apropos.

One should never generalize.

(From [plainlanguage.gov](#), a website on plain writing.)

May 2020—Upcoming Events in Our Area/Region (see details below)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10 Mother's Day	11	12	13	14	15	16
17	18	19	20	21	22	23 Show, Fair-hills, PA
26	25 Memorial Day	26	27	28	29	30
31						

Event Details

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

??: Rockville, MD—Gem, Lapidary and Mineral Society of Montgomery County. **Next meeting date to be determined. Check website [here](#).**

9: Towson, MD—31st Annual Chesapeake Gem, Mineral & Fossil Show; Chesapeake Gem & Mineral Society; Ruhl Armory, 1035 York Rd; 10–4; free. **Canceled.**

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

23: Fairhills, PA—Annual show; Rock & Mineral Club of Lower Bucks County, PA; Christ United Methodist Church, 501 Wistar Rd; 9–2; adults \$2, children 12 & under free; info: Brian Schwab, www.holschw2@aol.com. **Canceled? Check!!**

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



*Xenotime with golden rutile inclusions, Novo Horizonte, Bahia, Northeast Region, Brazil.
Source: Wikimedia; photos: Robert M. Lavinsky.*

Hutch Brown, Editor
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**Mineral of
the Month:
Xenotime**

PLEASE VISIT OUR WEBSITE AT:

<http://www.novamineralclub>

The Northern Virginia Mineral Club

Please send your newsletter articles to:

hutchbrown41@gmail.com

RENEW YOUR MEMBERSHIP!

SEND YOUR DUES TO:

Roger Haskins, Treasurer, NVMC
4411 Marsala Glen Way, Fairfax, VA 22033-3136

OR

Bring your dues to the next meeting.

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

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

Meetings: At 7:45 p.m. on the fourth Monday of each month (except May and December)* at **Long Branch Nature Center**, 625 Carlin Springs Road, Arlington, VA 22204. (No meeting in July or August.)

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

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