



Southern Maryland Rock and Mineral Club



ROCK TALK

May/June 2021

**22 June 1900 Meeting (Not Happening)
27 July 1900 Meeting (Looking Better)**

Meeting Possibilities for the Lapidary and the Rock and Mineral Clubs.

AS OF 07 June 2021... Changes MAY/WILL still occur!!

As you may know, we (Dave, Sondra and Bob) have been negotiating with Juan Rodriguez (new Nature Center Director since March 8th) about allowing our Rock Club to meet again at the Clearwater Nature Center (CNC). It has been a slow process due to several factors --- rapidly changing COVID rules; new way of doing things by a new Director; a shortage of CNC staff (currently 2 full time and 2 part time plus 2 more being hired); and a lot of things happening at same time (e.g., CNC summer camp staff training; moving animal cages, furniture and items temporarily stored in auditorium; organizing staff office locations that were moved due to COVID distancing;).

Sondra and Dave had a conference call with Juan this afternoon (07 June). Here is what we have agreed on so far:

1. Juan's style is to have everything in writing. He compared it to a Landlord having a new written lease for new renters. Things that occurred in the past with a handshake will be formalized in writing going forward
2. Our first meeting will be July 27 (always the 4th Tuesday) from 7:00 to 9:00 pm and we will

meet in the auditorium. Currently, thirty (30) people are allowed in the building (that number includes staff). We might be allowed more people by July 27. **Masks** must be worn at all times inside the building.

3. Nature Center(CNC) Staff person for July 27 meeting will be Glenda.

4. Our forehead temperatures will be taken and recorded before we enter the building.

5. Preps for July 27 meeting: Per Juan, audio-visual equipment will be available and in working order for the Program presentation.

6. **Meeting Refreshments** --- We (Club volunteers TBD) will provide ice, cups, paper plates and plastic ware plus snacks/drinks for refreshments. At this time, all food and drinks must be consumed outside on the adjacent patio. Six (6) foot social distancing is required outside on the patio when not wearing a face mask. **Trash** – We will leave trash and recycle items in 2 trash cans on patio. Staff will empty any trash into dumpsters.

7. Club officers will get there twenty (20) minutes early to set up for meeting on July 27.

8. Currently, facemasks are required inside all parts of CNC building at all times.

9. **Memorandum of Understanding (MOU):** We will be required to provide input to Juan for an MOU that specifies in detail what our responsibilities are as a club and what the CNC is responsible for (e.g., CNC pays EMLS Liability insurance and annual EFMLS dues). The MOU is not required before our first meeting, but must be completed later this year per Juan. Juan will provide a sample MOU to Dave by email so we can get started.

10. Liability waivers: Rock club members will not be required to sign liability waivers to meet in the auditorium, use restrooms, lobby and patio. However, Juan has requested that when we sign a waiver to conduct a Field trip at a quarry that we provide him a copy for his records. (This may be difficult to get a hard copy in some cases, so we must take a picture with a cell phone camera and forward it to Dave.)

11. Rock Club dues: Juan has indicated that the Rock Club dues may change. Juan and Sondra will have a conference call on Friday (June 11th) to specify the Rock Club dues. Then, the exact procedure will be emailed to all our members to pay dues through "ParksDirect" so we can start renewing our SMRMC memberships.

As of now we should start planning for our first meeting on July 27nd at 7:00 pm. Need a program/snacks for that night.

Field Trips -Due to the Current Club Dues Issues, No Club field trips will be planned until the Club Dues resolution is completed and members are paid in full. Sorry. Until then Individual trips are recommended.

MINUTES

No minutes for the May or June 2021 meeting due to COVID-19 rules the Clearwater Nature Center must follow.

Unfortunately "No News does not mean "Good News" in this situation.



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2020 / 2021 PROGRAMS/REFRESHMENTS SCHEDULE		
MONTH	PROGRAM	REFRESHMENTS
JUNE	CANCELLED	CANCELLED
JULY	WELCOME BACK (??) TBA	TBA
AUGUST	Traditional Club Auction Month	TBA
SEPTEMBER	TBA	TBA
OCTOBER	TBA	TBA
NOVEMBER	Elections / TBA	TBA
DECEMBER	Holiday Party	Pot Luck

PROGRAMS

Programs, like field trips, serve an essential part of our club. They provide an opportunity for members to share and learn from others the many facets (pun intended) of rocks, fossils, geology, and minerals.

Think about how you can contribute to a future meeting. We love to learn. Hope to see you all soon. Carole

From the Crowded and Extremely Messy Desk of the Editor:

Let me apologize for not having a dedicated MAY ROCK TALK. With the ever fluid COVID Pandemic rules and how PG County Officials desire (or not) to follow the Center for Diseases Control and the Governor of Maryland guidelines the Rock Talk cover stories has changed multiple times. Attempts to publish the latest information has been a true challenge. I am afraid once I hit the "send button" I will get another email with more changes that will make what was published obsolete.

As ALWAYS, I look for articles related to the interests of the club members or something related to the localities near to us that we may

visit and/or collect from. IF other topics are desired or if articles that are worth sharing I might have missed - PLEASE forward them for inclusion in the Rock Talk.

If any individual/family/etc goes on an outing that has a successful day collecting - I am highly interested in a short description of what was collected, who was there and where (generalities is good - exact location can stay private) along with some photos (yeah, I'm pushing my luck here) - I will get the event into the ROCK TALK!!

On the Virtual Meeting Front, the next Eastern Federation Editors Unite ZOOM meeting will be 28 April. This is forecasted as the last meeting until the fall, UNLESS something of dire importance needs to be discussed, shared or put out for the better or worse of the Federation Newsletter writers needs.

Approximately twenty (20) editors across the region are expected again with the agenda in development. The last meeting Minutes are attached as a separate file. The URL below will be the site for all meeting minutes, newsletter informational help and other material necessary for the editors.
<https://efmls.org/editors-united/>

Calendar of Events

Many events have been postponed/cancelled and/or rescheduled due to the COVID-19 pandemic.

Please check with the sponsoring club to make sure the event has not been cancelled due to the ongoing COVID-19 pandemic before attending any event.

July 9-11 -- SYRACUSE, NY - Mark your calendars for the 2021 EFMLS Annual Meeting Syracuse, New York. Sponsored by the Gem and Mineral Society of Syracuse, New York. As the date draws nearer, more information will be forthcoming.

October 30, 2021 ULTRAVIOLATION SHOW

Where: First United Methodist Church, 840 Trenton Rd, Fairless Hills, PA

When: 9:00 AM to 4:00 PM

What: ULTRAVIOLATION is the ULTIMATE annual show for the fluorescent mineral enthusiast, whether a novice or serious collector. The show features many of the world's premier fluorescent mineral COLLECTORS AND DEALERS who strive each year to bring the biggest, brightest and best fluorescent minerals to satisfy the insatiable cravings of the fluorescent collector. ULTRAVIOLATION highlights fluorescent minerals exclusively and is the next best thing to night collecting. Free admission and a fluorescent mineral specimen for each junior mineralogist 12 years and younger when accompanied by an adult.

Admission: \$2.00 Donation, Children 12 & Under Free

Dealers: 8' TABLE \$30 – ½ TABLE \$15
ADVANCED REGISTRATION FOR DEALERS IS ADVISED

SEND YOUR CHECK MADE PAYABLE TO:

Lee McIlvaine, 8510 Elliston Dr. Wyndmoor, PA 19038 Or PAYPAL electronic payment to leemcilvaine@yahoo.com

For information call Lee McIlvaine at 215-713-8020 or email uvgeologist@yahoo.com

June 12, 2021 - Cherry Hill, NJ

1st Annual *SUMMER* South Jersey Gem, Jewelry, Mineral & Fossil Show

Location: 1721 Springdale Road Cherry Hill, NJ 08054

Show Times: Saturday (6/12/21) 10:00 am - 5:00 pm (Saturday Only) (Outdoor Only)

*Rain Date: Sunday (6/13/21) 10:00 am – 5:00 pm (Outdoor Only)

Website: www.sjmineralshow.com

Facebook: www.facebook.com/sjmineralshow

10 JULY 2021 - Lynchburg VA

GMSL Show and Sell

The Gem and Mineral Society of Lynchburg would like to invite you to our Inaugural Show and Sell.

When: July 10, 2021
10 am - 5 pm

Where: Moose Lodge 715 Banquet Hall
2307 Lakeside Dr. Lynchburg, VA 24501

Open to all surrounding Clubs, entry is free!! Tables for club sellers are \$30each or 2 for \$50
Must purchase tables by July 1st
Please email lynchburgrockclub@yahoo.com for more info

Food will be available on site through Hot Diggity Dogs

Pickers Wheel

Raffled Specimens

The (Almost) Hidden Monster (Odessa, DE) by Dave Lines

Rich and I were exploring a tiny stream in the woods looking for petrified wood. Since almost all of the ground itself was covered with verdant springtime vegetation, any patches of bare soil were great places to concentrate our efforts. Rich had gone in one direction and I had turned the other way. So far, during our 30 minutes of searching, we had each found several decent pieces of wood ranging from tiny to hand sized. I was walking in the stream itself when I spotted a narrow deer trail going up the stream bank. Because the trail offered some bare ground where the deer hooves had dug in, I decided to follow the worn path in hopes of picking up a few more specimens.

But first, a little background. Rich and I (as well as Alton who drove separately) had decided just the evening before to participate in the semi-annual event called "The John Wolf Memorial Trip" in honor of a deceased beloved member of the Calvert Marine Museum Fossil Club. Hosted by the fossil club each spring before crop planting and again following harvest on the Saturday after Thanksgiving, this field trip has become a favorite of many local rock hounds. The host has generously invited all those regional rock clubs interested in fossils from Maryland, northern Virginia, Delaware and Pennsylvania since the location (a large farm in Odessa, Delaware) provides plenty of parking. Somehow, the trip announcement for this trip had not been emailed to me as the Southern Maryland Rock and Mineral Club field trip chairman. But a friend who is the Trip Coordinator for the Delaware Mineral Society forwarded the trip info to me at the very last minute --- on Friday afternoon --- just the day before the scheduled trip on May 1st. After some scrambling to get the "short notice" trip announcement emailed to our club members, I called all those who had signed up to attend the trip previously planned for March 21, 2020 --- over a year before. Because of the initial

unknowns of the COVID pandemic --- transmission methods? contagiousness? a 2.5 hour drive with stops at public gas stations and restrooms? --- they had all elected to not attend the 2020 event. So I contacted those club members first to see if they could go on this trip --- most could not due to previous plans.

The meeting time for this trip was set at the farm at 10:00 a.m. --- with a request to not to begin looking in the fields before that time. However, Rich drove for us and he likes to get on the road early. We had set a time to meet at my house at 6:30 a.m., but Rich always arrives early, so we were pulling out my drive by 6:30. Bottom line is that we arrived in Odessa a full hour early. What to do? Not ones to waste precious rock hounding time, there was no question about it --- we decided to look somewhere else for an hour before going to the designated farm. Since this was not our first trip to this area, we went to one of several undisclosed alternate locations that we knew about.

Before I go back into further detail about that part of our adventure, let's jump ahead to 10:00 when we arrived at the farm. There were already at least 30 cars parked along the long farm road so I called Alton on my cell to see if he had arrived. Yes --- his truck was the first one at the far end of the line of vehicles. Since this was his first try at finding petrified wood, I asked him to join us so we could show him what to look for. While waiting for him, I talked with several other folks and showed one lady (her first time there) how to spot the wood. She caught on quickly and was happy to get some tips. When Alton arrived, I did the same with him and within a few minutes, he had picked up several pieces. In fact, he needed no more help because he found a nice double fist sized hunk of petrified wood right away.

The field had produced a crop of soybeans last year and the remaining winter weeds had been treated with herbicide about a

month ago, so the cover was very thin and it was easy to see the ground. On top of that, the rainy wet weather last Fall had obviously left the field soil very soft and muddy in spots because there were numerous areas throughout the fields where the large combine tires had created deep ruts when the beans were harvested. All this meant more bare ground and better conditions for us to find petrified wood. And judging from our buckets, find it we did. Rich, Alton and I all found some pretty good pieces. Additionally, we picked up quite a few interesting rocks which --- surprisingly --- were very plentiful in some areas of the fields. I think of Delaware as being flat with sandy soil. These fields were fairly flat, but the soil here was very rocky on some portions of the farm. And the rocks were of all sizes --- some being as large as basketballs with rounded edges like those in Southern Maryland. I even found a baseball sized piece of pegmatite laced with mica crystals in smoky quartz. Red and yellow jasper were also fairly common. I also saw some clear smoky quartz and some rocks that looked like Patuxent River Stone. I kept an eye out for native American artifacts but I did not find any this time. I did see a perfect white quartz atlatl point about 1-1/2 inches long that Ross of the Delaware Club had found. Very nice.

In the early afternoon, Alton decided to call it a day. That lady who I had helped at the beginning took a picture of the three of us from SMRMC. Alton declared that he had had a great time and he left at about 2 p.m. Rich and I looked at each other and decided to return to our other alternate location as it seemed to have more potential. We returned and found more wood – especially in the small gulleys and bare areas in the woods.

Back to beginning of the story when I was followed the deer trail --- little did I know that this would turn out to be a very fortuitous decision. I went up the stream bank and picked up a small piece of petrified wood about 2 inches long laying right in the trail. The trail lead along the edge of a pile of rocks that had been

dumped there many years ago by some farmer who had been clearing his field. At this point, the deer trail sort of faded away into the green vegetation. I turned to go back when I spotted what looked like a small 3 inch piece of petrified wood poking out from under the bottom edge of one of the rocks in the pile. I stopped and moved one medium sized rock out of the way and reached down to pull out the piece of wood. But it would not budge. I called out --- “Hey Rich. Come here! Quick!!” He came right away and immediately tried to use his garden scratcher to pull out the piece. No luck. It would not move. Whoa! We began to move several other rocks out of the way and I used my little rock pick (the smallest size they make) to dig away the dirt along one side. At first, I assumed it was just a slightly larger chunk buried in the dirt. But I could not find the edge. I dug down about 6 inches and removed a goodly pile of dirt --- fortunately, it was soft loam --- and then I removed another large rock to the left of the protruding wood. Whoa --- there was another piece of petrified wood showing about 2 feet away. Then it dawned on us --- this was all one piece. Holy moly! We cleared away more dirt and more rocks as it went down into the ground at least a foot. We tried to pull it out several more times but a large grapevine which had grown across the left end held it firmly in place.



We had no way to cut the grape vine, so we concentrated on the right side and kept digging away more dirt and big rocks. Finally, we pulled the piece out from under the vine but the sucker was hard to move. We pushed and rolled it out toward the uphill side. It was a monster!!

Trouble is we only had about 15 minutes left before we needed to meet at the farm field and it was a hundred yards back to Rich's truck. I tried to pick it up. It was very heavy and about all I could do to carry it just 10 yards. Rich took his turn and carried it another 15 yards. Amazing that he went further than me. We decided that we needed to try something different. We returned to the truck and Rich got out a couple of nylon tie down ratchet straps which we took back to the petrified wood and tied each around it. Then we both grabbed a strap and together pulled it over the ground back to where we could load it into the truck. Together, we picked it up and put it into the back seat. We agreed not to tell anyone at the field trip because of the commotion it would cause.

So it remained there for the rest of the trip until we returned to La Plata. Back home, Rich suggested we weigh it. Okay, I could do that quickly with a large galvanized tub, some rope, a 250 pound scale and my electric hoist in the shop. Within minutes, we had it in the tub and hoisted up.



Beforehand, Rich had estimated 60 to 70 pounds. The scale showed it was 120 pounds! Incredible that us two old guys had each picked it up. I washed it off the next day and it showed beautiful tight grain and a lot of character with small knots and an area where the straight tree trunk flared out at the bottom of the tree. It is definitely a find of a lifetime, but way too large and heavy to display on a shelf in my rock room. It will look great as a focal point out in the flower bed in our backyard. The chipmunk will love it. And just think, it had almost been totally hidden.



Park Ranger Stumbles Upon Treasure Trove of Several-Million-Year-Old Fossils in Northern California

Paleontologists found hundreds of Miocene fossils, including an 8-million-year-old mastodon, at an undisclosed location in the Sierra Nevada foothills

<https://www.smithsonianmag.com/smart-news/treasure-trove-fossils-uneearthed-california-watershed-180977796>

By [Elizabeth Gamillo](#)

SMITHSONIANMAG.COM

MAY 24, 2021



The treasure trove discovery began when park ranger and naturalist Greg Francek from the East Bay Municipal Utility District (EBMUD) first stumbled upon a petrified forest while on patrol in the Mokelumne River Watershed, located in the Sierra Nevada. [Jason Halley, California State University, Chico](#)

In the foothills of the Sierra Nevada Mountains in California, paleontologists have uncovered a collection of fossils, including an eight-million-year-old mastodon skull with both tusks intact, a rhino skeleton, a giant tortoise, 600 petrified trees, and many more specimens. Dating back to the [Miocene epoch](#), the site is

considered one of the most significant fossil discoveries in California history, reports Andrew Chamings for [SFGate](#).

"Few other fossil discoveries like this exist in California," says California State University paleontologist Russell Shapiro, to Ashley Gebb for [Chico State Today](#).

Park ranger and naturalist Greg Francek from the East Bay Municipal Utility District (EBMUD) first stumbled upon a petrified forest while on patrol in the Mokelumne River Watershed, located in the Sierra Nevada, reports the [Chico State Today](#).

"I looked around the area further, and I found a second tree," Francek says in a [statement](#). "And then a third and so on. After finding dozens of trees, I realized that what I was looking at was the remains of a petrified forest."

After three weeks of surveying and uncovering more fossilized pieces of the forest, Francek found what appeared to be vertebrate fossils, [Chico State Today](#) reports. From there, EBMUD reached out to paleontologists and geologists from [California State University, Chico](#), to take a closer look.



The mastodon tusks spanning almost six feet, were found upside down, each one crossing each other. To preserve the tusks, paleontologists coated them with a mixture of acetone and liquid plastic. [Jason Halley, California State University, Chico](#)

Shapiro's team excavated the site and uncovered the tip of a pearly, white bone. As the team etched away at the rock encasing the bone, teeth, a skull, and two tusks belonging to the elephant-like, eight-million-year-old mastodon emerged, reports Tia Ghose for [Live Science](#). The last time mastodon remains were found in California was in 1947 during pipeline construction, EBMUD explains in a statement.

In the past year since the initial discovery, Shapiro and his team have found hundreds of animal fossils from varying species within the site of the petrified forest remains. Among the finds were a horse, a tapir, the remains of an ancestral 400-pound salmon with sharp teeth, an extinct species of camel that was as tall as a giraffe, and a gomphothere, which is an ancient elephant with four tusks, SFGate reports.

With each fossil find, the team unraveled the region's geologic history and suspect that the remains ended up in the watershed when floods and volcano debris flows carried them there, reports [Live Science](#). The team also hypothesized that the enormous, fossilized mammals roamed the area's oak and flood plains.

"The bones paint a clearer picture of life 10 million years ago when animals evolved from living in forests to grassland as the landscape changed," Shapiro says in a statement. The excavation team plans to continue excavating at the undisclosed site location and studying the fossils for further insight into the area's history. Those interested in seeing the mastodon skull can view it on display starting September 1 at the California State University, Chico's Gateway Science Museum, reports [Chico State Today](#).

Elizabeth Gamillo is a science journalist based in Milwaukee, Wisconsin. She has written for [Science](#) magazine as their 2018 AAAS Diverse Voices in Science Journalism Intern.

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History of the Southern Maryland Rock and Mineral Club

(This info was recently gathered by Dave Lines from various sources including Sandy Lyon, Lorna Larson [1st Club President], Ron Tonucci [early club president] and Ellery Borrow --- EFMLS)

Sandy Lyon, who served as the Director of the Clearwater Nature Center for 35 years (1970 – 2005), started a group of experienced and knowledgeable people (including retirees) known as the "Clearwater Associates" in 1982 in order to create more programs. One of their members, Audrey Maynard, in 1986 donated a (one) rock polishing machine which was the beginning of several additional lapidary machine donations by others. Audrey taught the first "Rock and Mineral Class" and the first "Rock Polishing and Jewelry Making" class that year and continued for several years thereafter. The folks who completed the lapidary class continued to meet informally. In 1989, the "Southern Maryland Rock and Mineral Club" was officially formed. They joined the EFMLS (Eastern Federation of Mineral and Lapidary Societies) in 1990. The first club "Rock Show" was held at the Clearwater Nature Center in 1990 and was an overwhelming success with 800 visitors --- a total which was not reached again until the "25th Annual Mineral, Jewelry and Fossil Show" held in 2015 with over 1,000 attendees at the Showplace Arena in Upper Marlboro."

Study Plucks Rare Quasicrystal From Wreckage of First Atomic Bomb Test

Researchers found the strange material inside a piece of red trinitite, a glass-like amalgam formed by the blast's intense heat and pressure

<https://www.smithsonianmag.com/smart-news/study-plucks-rare-quasicrystal-wreckage-first-atomic-bomb-test-180977781>

By [Alex Fox](#)

SMITHSONIANMAG.COM
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The atomic age dawned at 5:30 a.m. on July 16, 1945, when the United States detonated a device nicknamed "Gadget" in the New Mexico desert, triggering Earth's first ever atomic blast.



This sample of red trinitite contained the quasicrystal described in a new study. [Paul J.

The plutonium-powered test explosion, codenamed "Trinity," unleashed [18.6 kilotons of power](#), producing temperatures hotter than the surface of the sun. The bomb vaporized the 100-foot tower it had been hoisted into for the test, and liquified the asphalt and sand below. The amalgam of melted sand, asphalt and other debris including copper and iron cooled into a glass-like material dubbed trinitite after the name of the test.

Now, researchers studying the otherworldly wreckage of that first atomic test say the extraordinary heat and pressure of the

event also produced an exceedingly rare form of matter called a quasicrystal, reports Emily Conover for [Science News](#).

Normal crystals have a regular, repeating structure like a brick wall or a lattice. Quasicrystals, on the other hand, have been dubbed "impossible" materials by scientists because of their unusual, non-repeating structures, reports Davide Castelvetti for [Nature](#). The quasicrystal scientists discovered was nestled amid a hunk of red trinitite and measures just ten micrometers across. It's the first known example of a quasicrystal that combines iron, silicon, copper and calcium, the researchers report this week in the journal the [Proceedings of the National Academy of Sciences](#).

One of the only other places quasicrystals have been found is on meteorites and that was what spurred researchers to look for them in the aftermath of a nuclear bomb. "It was a surprising discovery," Luca Bindi, a geologist from the University of Florence and the paper's first author, tells Sarah Wells of [Inverse](#). "[T]he idea behind it was: if these materials can really form in the collision of extraterrestrial objects in outer space, then it is conceivable that they formed also in an atomic blast. And they were there."

Quasicrystals are "impossible" because they violate the rules scientists use to define crystalline materials. Bindi tells [Inverse](#) that crystals are "allowed" to have what's called rotational symmetries—that is, places where the structure could be symmetrically split in half—along one, two, three, four and six axes. The newly discovered quasicrystal doesn't play by these rules.

"Icosahedral symmetry, which includes six independent five-fold symmetry axes, is super-forbidden," Bindi tells [Inverse](#). "Quasicrystals are solids with these rotational symmetries that are forbidden for crystals."

The researchers discovered the tiny grain of quasicrystal by “looking through every little microscopic speck” of the trinitite sample, Paul Steinhardt, a theoretical physicist at Princeton University and co-author of the study, tells *Science News*. Researchers confirmed the novel material’s unorthodox structure by scattering X-rays through it to reveal its “forbidden” symmetry.

In a [statement](#), Terry C. Wallace, director emeritus of Los Alamos National Laboratory and co-author of the paper, says that quasicrystals might one day be able to be used to piece together information about old nuclear tests.

“Understanding another country’s nuclear weapons requires that we have a clear

understanding of their nuclear testing programs,” says Wallace. “We typically analyze radioactive debris and gases to understand how the weapons were built or what materials they contained, but those signatures decay. A quasicrystal that is formed at the site of a nuclear blast can potentially tell us new types of information—and they’ll exist forever.”

Alex Fox is a freelance science journalist based in Washington, D.C. He has written for *Science*, *Nature*, *Science News*, the *San Jose Mercury News*, and *Mongabay*. You can find him at Alexfoxscience.com.

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How the World’s Largest Aquamarine Gem Came to Be

<https://www.smithsonianmag.com/blogs/national-museum-of-natural-history/2021/03/16/how-worlds-largest-aquamarine-gem-came-be>

March 16th, 2021, 6:00AM / BY [Abigail Eisenstadt](#)



Dom Pedro aquamarine was cut from a 100-pound crystal that was mined in the late 1980s. It weighs around 4.6 pounds, making it one of the largest aquamarine gemstones in the world. (Donald E. Hurlbert, Smithsonian)

For those who study what happens when magma and crust collide, igneous rocks like pegmatites are a welcome sight. But in addition to holding clues about Earth’s mineral and geologic processes, pegmatites deposits are known for containing diverse and richly colored mineral crystals that can be cut into spectacular gems. One of the largest — if not best — example is the Dom Pedro Aquamarine.

This roughly 4.6-pound gem was cut from a massive 100-pound aquamarine crystal unearthed in the late 1980s. Today, it sits in the Smithsonian’s National Museum of Natural History, enticing visitors to explore the Hall of Geology, Gems, and Minerals and inspiring curiosity about the crystals and minerals resting inside Earth’s rocks.

“It doesn’t look like most gems people are used to looking at, like ones in pieces of jewelry. It draws people into the gallery and gives us an opportunity to show how every gem, just like this aquamarine, started out as a mineral crystal that formed in the Earth,” said Dr. Jeffrey Post, Curator-in-Charge of Gems and Minerals at the museum.

Journey from the center of the Earth

Although aquamarines are known for their “color of the sea” blueish-green color, they are made of the same mineral, called beryl, as gems like green emeralds, pink morganites and yellow heliodors. These gems all start as high-quality beryl crystals. Each gem’s respective color comes from impurities within beryl’s mineral composition. For example, aquamarines are caused by adding two types of iron atoms to beryl as it forms.



Aquamarine is a type of beryl, a mineral composed of beryllium, aluminum, silicon and oxygen. The aquamarine crystal shown here and cut gems get their blue color and green undertones from iron impurities. (Chip Clark, Smithsonian)

“When you grow pure beryl crystals in a lab, they’re colorless. But it turns out Earth is a pretty dirty place to grow crystals, so natural crystals always contain some impurities,” said Post. “In the case of aquamarine, iron gets trapped in beryl as its growing. Then, light interacts with that iron and gives the aquamarine its color.”

Beryl is commonly found in pegmatite formations, which occur when hot magma pushes from deep in the earth up into the crust and cools into a granite body. As the molten rock cools, it crystallizes. How it crystallizes depends on the concentration of water present within the magma.

“As this magma body is cooling, the more water-rich part is the last to crystallize and rises to the top. It becomes like scum on a cooling pot of soup,” said Post. “And in this water-rich portion, there is also an accumulation of elements, such as boron, beryllium, and lithium that don’t easily fit into the crystal structures of the minerals in the granite.”

When those elements swirl around the top layer of crystallizing water rich magma, they cool and form minerals like beryl. Sometimes, they absorb other leftover atoms too like the iron that turns beryl into aquamarine.

“When everything is finally cooled, you have a pegmatite body composed mostly of large crystals of quartz and feldspars, and they sometimes have cavities. Miners try to locate these cavities, or pockets, and if they are lucky they will have big crystals in them, perhaps of beryl,” said Post. “That’s how the Dom Pedro aquamarine was found.”

Sculpting with an unusual medium

The Dom Pedro was found in a Brazilian pegmatite mine and named after Brazil’s first two emperors. The original crystal initially weighed over 100 pounds but shattered into three pieces during its excavation. The largest piece, which was roughly 60 pounds, then traveled to the studio of a famous gem artist in Germany who sculpted it into the obelisk shape it has today.

“At the bottom of the obelisk, you’ll see a series of parallel vertical lines, which are hollow tubes, imperfections, that formed when the crystal was growing,” said Post. “The artist decided to leave them in the sculpture because those imperfections are part of the story for this crystal’s formation.”



The Dom Pedro aquamarine resides in the museum's Hall of Geology, Gems, and Minerals, where it has inspired visitors virtually and in person to think about the natural wonders of the world. (James Di Loreto, Smithsonian)

Once an obelisk gem sculpture, the Dom Pedro was then sold, and later donated by Jane Mitchell and Jeffery Bland to the Smithsonian's National Gem and Mineral Collection. It now lives 30 feet from the Hope Diamond, greeting museumgoers as they explore the Hall of Geology, Gems and Minerals in-person and virtually.

"For all our gems, we want people to see them and realize that the Earth is an amazing place, and that science is more interesting than they may have thought," said Post.

A gem of a collection



The museum's mineral sciences collection contains more than gorgeous gemstones. It also houses rocks and minerals that scientists study to understand Earth. Museumgoers can see these specimens in the Hall of Geology, Gems and Minerals alongside the Dom Pedro. (James Di Loreto, Kate D. Sherwood, and Lucia RM Martino, Smithsonian)

By studying how crystals, minerals and rocks form, mineral scientists at the National Museum of Natural History are learning more about the world's geologic past and present. For example, rocks can teach researchers what early Earth's mineral composition may have been, while meteorites let scientists analyze minerals in the asteroid belt.

All of these specimens, whether on display in the Hall of Geology, Gems and Minerals or stored in museum's collection, are cared for by the mineral sciences department.

"Every one of these started out as a mineral that formed in the Earth. Our collection is a great way to show people that story," said Post.

Abigail Eisenstadt is a Communications Assistant at the Smithsonian's National Museum of Natural History. She brings science to the public via the museum's Office of Communications and Public Affairs, where she tracks media coverage, coordinates filming activities, and writes for the museum's blog, Smithsonian Voices. Abigail received her

master's in science journalism from Boston University. In her free time, she is either outdoors or in the kitchen.

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Man Stumbles Upon Prehistoric Sea Turtle Fossil That Could Be a New Species

Aristos Georgiou

An amateur fossil hunter has discovered an ancient fossilized sea turtle on Vancouver Island, Canada.

Russell Ball came across the ancient fossil during a walk along the Puntledge River in January, he told The Canadian Press news agency for a report published on Sunday. At one point in the walk, Ball—a retired military explosives disposal expert who has collected thousands of fossils in his lifetime—noticed something unusual in the ground and began digging to see what he could find.

"Every single time I do that, it's the same fun as opening a gift. You don't know what's going to be inside there," he told The Canadian Press.

"And when you find a [fossil](#), you're the only person in the history of humans to have ever seen that creature."

Extremely exciting #FossilFriday News: "Royal BC Museum collects unidentified prehistoric sea turtle fossil!" <https://t.co/ps3FIWwgqM> pic.twitter.com/yv35C6U702

After finding the fossil, Ball contacted the Vancouver Island Paleontological Society, who agreed that it was likely an ancient sea turtle. He also contacted the Royal British Columbia Museum and the British Columbia Fossil Management Office.

In April, Derek Larson, paleontology collections manager for the museum, collected the extracted fossil, which is now being kept at the facility.

"Russell Ball and the Vancouver Island Paleontological Society did everything right," Larson said in a museum press release. "They recognized the discovery's significant scientific value and immediately set to work ensuring the fossil would end up where everyone in B.C. will be able to access and study it."

Experts have determined the fossil to be around 84 million years old. And museum officials think the remains may represent one of two known species of ancient sea turtle that have previously been found in the area. There is also the possibility that the [fossil](#) could belong to a new species altogether.

"Either way, this discovery is a win for paleontology in British Columbia," Larson said in the museum press release. "If the [fossil](#) is a known species, we'll learn a lot of new information about that species because these specimens are rare and, so far, incomplete.

"If the fossil turns out to be a species that is new to science, that could exponentially advance our understanding of marine ecosystems millions of years ago."

Experts at the museum are now preparing the fossil and examining it in fine detail to understand what species it represents.

The Puntledge River is a site that is known to be rich in fossilized invertebrates—animals without backbones. But discoveries involving vertebrates—animals with backbones, such as sea turtles—have been much rarer.



The Southern Maryland Rock and Mineral Club

Meetings take place on the 4th Tuesday of each month at
7:00pm

Clearwater Nature Center, 11000 Thrift Road, Clinton, MD.

For More information, call:

(301) 297-4575

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