



# The Mineral Newsletter

**Meeting: April 25 Time: 7:45 p.m.**

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



Volume 57, No. 4

April 2016

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## April Program:

Mindat Conference Report

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# Sulfur

from Agrigento, Sicily

[Smithsonian National Mineral Collection](#). Photo: Chip Clark.

## Mineral of the Month: Sulfur

by Hutch Brown

Sulfur ( $S_8$ ), the tenth most abundant element in the universe, has been known since ancient times. The name comes from the Latin word *sulphurium*; hence the British spelling—sulphur.

In antiquity, sulfur was used in medicines and for fumigation and bleaching cloth. In some ancient religions, including Christianity, sulfur (“brimstone”) was associated with fire in the underworld, perhaps due to its connection with volcanic vents and hot springs.

In 1777, the French chemist Antoine Lavoisier first identified sulfur as an element. Sulfur is a component of such common minerals as galena ( $PbS$ ), pyrite ( $FeS_2$ ), celestite ( $SrSO_4$ ), and barite ( $BaSO_4$ ).

Sulfur crystals are found all over the world, although most of the best crystals come from Italy, including the specimen on the cover (from Agrigento, a locality in Sicily famous for its crystalline sulfur). Some of our club members have found sulfur crystals at fumaroles in Nevada.

Sulfur is brittle and soft, with a hardness of 1.5 to 2.5. Typically yellow, it ranges in color from yellow-brown to yellow-green and even comes in orange and white.

Sulfur has transparent crystals in the orthorhombic crystal system and a resinous or greasy luster. Sulfur melts at 239 °F into a red liquid, and it burns with a blue flame.

Sulfur is odorless. The familiar rotten-egg smell comes from hydrogen sulfide gas ( $H_2S$ ), common in hot springs. Sulfur easily dissolves in hot water. Associated with igneous and sedimentary rocks (such as salt domes), sulfur is usually produced by injecting underground deposits with hot brines. Sadly, crystals dissolve in the process.

Sulfur is used to produce sulfuric acid ( $H_2SO_4$ ), which in turn goes into fertilizers and lead-acid batteries as well as into many industrial processes. Sulfur is also used to vulcanize natural rubbers, as an insecticide, in the manufacture of gunpowder, and as a dying agent.

Sulfur dioxide ( $SO_2$ ), formed by burning sulfur, is used as a bleaching agent, solvent, disinfectant, and refrigerant. Combined with water, sulfur dioxide forms sulfurous acid ( $H_2SO_3$ ), a major component of acid rain.

Sources: [Jefferson Lab](#), [Mindat](#), [Wikipedia](#)

## Belated Happy Easter!



### Northern Virginia Mineral Club members,

Please join our April speaker, Casper Voogt, for dinner at the Olive Garden on April 25 at 6 p.m.

*Olive Garden, Baileys Cross Roads (across from Skyline Towers), 3548 South Jefferson St. (intersecting Leesburg Pike),*

*Falls Church, VA*

*Phone: 703-671-7507*

Reservations are under Ti Meredith, Vice-President, NVMC. Please RSVP to me at [ti.meredith@aol.com](mailto:ti.meredith@aol.com).

**Casper Voogt**

### International Mindat Conference April 25 Program

Many NVMC members are familiar with the Mindat Internet site, an invaluable source of information about our hobby. Mindat also has marvelous images of many different minerals.

Beginning in 2011, Mindat sponsored an annual international conference held in a country of mineralogical interest. In 2014, Madagascar was the country of choice.

Our presenter for April, Casper Voogt, had the good fortune to be one of 60 participants at the Third International Mindat.org Conference. Casper will present an overview of the 16-day conference, which might better be described as a geological/mineralogical tour, with stops at mineral markets, nature reserves, natural wonders, and other attractions. Casper's trip included several days of hearing presentations and lectures, including by Dr. Federico Pezzotta, Curator of Min-

eralogy at the Museum of Natural History in Milan. The mineral pezzottaite is named after Dr. Pezzotta.

Casper will present a summary of the trip, including mineralogical and other highlights (such as lemurs, chameleons, villages, food, and people). He will show some of the specimens he brought back.



*Pezzottaite, named for Dr. Federico Pezzotta, who spoke at the Mindat conference in 2014.  
Source: Wikipedia.*

Casper is a part-time mineral dealer, lifelong mineral collector, and avid traveler. His academic background is in architecture (Princeton and Georgia Tech). He has lived in Aruba, the Netherlands, Switzerland, and the United States.

Casper runs a Web development company and serves as Webmaster for the Northern Virginia Mineral Club, the Mineralogical Society of the District of Columbia, and the Gem and Mineral Society of Lynchburg, VA. ♪

Astute observers will have noticed that the picture of me used for this column involves me peering into a microscope, not crawling around a quarry or other field collecting site. That's because I am one of those crazy people who are into micromounting. We collect small crystals, which have more perfect crystal form, are easier to come by, and are considerably cheaper than larger specimens.

If you would like to investigate micromounts and see if the hobby is right for you, you can do no better than to come to the Atlantic Micromounters' Conference on April 22–23 (see article by Kathy Hrechka on page 5). Or come to any meeting of the Micromineralogists of the National Capital Area on the 4th Wednesday of the month at 7:30 p.m. at the Long Branch Nature Center. ♪

## **March Meeting Minutes March 28, 2016**

*by David MacLean, Secretary*



**P**resident Bob Cooke called the meeting to order at 7:30 p.m.

The president inadvertently skipped approval of the minutes from the club's February 22 meeting. Approval will be deferred until the April 25 meeting.

The president recognized past presidents Sue Marcus, Rick Reiber, Barry Remer, and Wayne Sukow.

The president also recognized guests Walter Cruise, Ava Desorrento, Jay and Young Jung, Beck Lynch, Sandra Paik, Lisa and Thomas Smyth, and Soo Yee.

## **New Business**

The president said that the club board will work on getting a draft 2016 NVMC budget to club members as soon as possible. The draft will appear in a future issue of *The Mineral Newsletter*, and the members will vote on it at a subsequent club meeting.

## **Announcements**

NVMC dues for 2016 are past due! See the last page of this issue for instructions on how to pay your dues.

The Long Branch Nature Center asked everyone to drive out slowly to avoid hitting the frogs and salamanders crossing the road to the pond.

## **The Prez Sez**

*by Bob Cooke, President*

**I** hope everyone got their tax refund in time for last month's auction. Unfortunately, I failed in two ways. One: I haven't done my taxes yet. Two: I expended all available credit at the March GLMSMC

mineral show in Gaithersburg, MD. At least I found some new treasures for my collection.

Please take a critical look at this month's *The Mineral Newsletter*. Editor Hutch Brown has made a special effort to introduce some new features and to explain the pluses and minuses of the AFMS and EFMLS newsletter contest.

But he needs your feedback to tailor our newsletter to the needs of our club. Let him know what features you like or don't like and what features you'd like to see but nobody has even suggested yet. You can contact Hutch at [hutchbrown41@gmail.com](mailto:hutchbrown41@gmail.com) or me at [rdotcooke@verizon.net](mailto:rdotcooke@verizon.net).





A fossil-hunting trip to the beach will take place at low tide at Stratford Hall (next to Westmoreland State Park in Virginia) on April 30 and June 12. Fossils include sharks' teeth and bones. The fee is \$50.

A mineral-collecting field trip is scheduled for 9 a.m. on Wednesday, April 6, at the Bluegrass Texas Quarry, 10000 Beaver Dam Rd., Cockeysville, MD 21030. The age limit is 17 and up; full safety gear is required. If you are interested, please contact Sam Linton at [cooldragonshirts@yahoo.com](mailto:cooldragonshirts@yahoo.com).

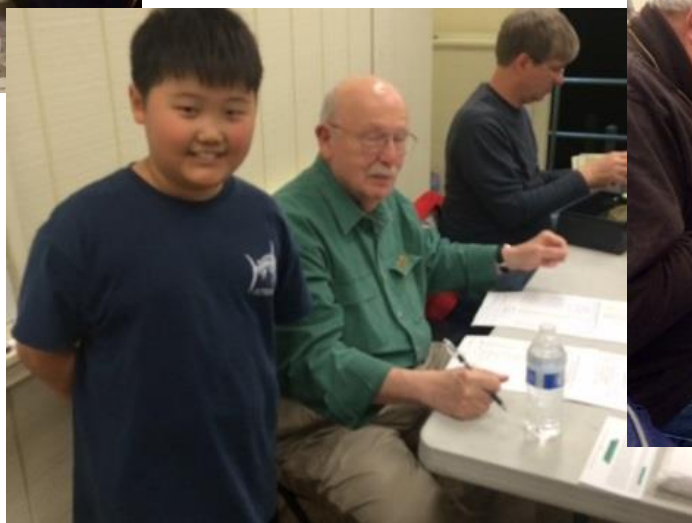
The annual Atlantic Micromounters' Conference is on the evening of Friday, April 22, and all day long on Saturday, April 23. See details in the article by Kathy Hrechka on page 5.

### Club Auction

The business meeting adjourned, and the mineral auction began. With so many members and guests in attendance, the auction was a huge success!

➤

**Scenes from the  
March NVMC club  
auction ...  
thanks to  
Sheryl Sims for  
some great photos!**



## Atlantic Micromounters' Conference April 22–23, 2016

by Kathy Hrechka, Conference Chair

**T**he Micromineralogists of the National Capital Area, Inc., invite you to join us for the 43<sup>rd</sup> Annual Atlantic Micromounters' Conference on April 22–23 at the Marriott SpringHill Suites in Alexandria, VA.

Our featured speaker will be Tony Nikischer. Tony's interest in minerals was stimulated by an early visit to Franklin, NJ, in the 1960s. Today, he is founder and president of Excalibur Mineral Corporation, arguably the largest provider of systematic minerals in the United States. The company has specialized in rare minerals for researchers, museums, and private collectors worldwide since 1974.

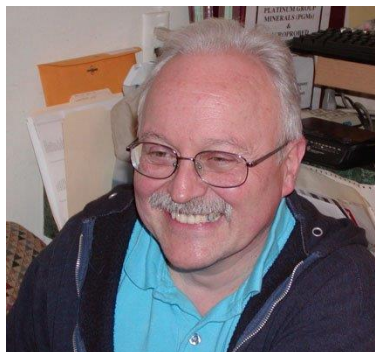
Tony operates an in-house analytical laboratory and publishes the monthly periodical *Mineral News*. He is the founder and chairman of The Hudson Institute of Mineralogy, a not-for-profit foundation devoted to studying and preserving the mineral kingdom while educating the public about it. The Institute is the parent organization of Mindat.org, the most prolific and widely viewed mineralogical Website in the world.

Tony has served as a director of the Friends of Mineralogy. A Life Member of the Mineralogical Society of America, he is also a member of both the Mineralogical Association of Canada and the Mineralogical Society of Great Britain.

In 2001, the new mineral "nikischerite" was named in Tony's honor. Tony has contributed over 200 articles to publications such as *The Mineralogical Record*, *Rocks & Minerals*, *Mineral News*, and *Applied Spectroscopy*, and he has coauthored descriptions of a number of new mineral species. He received the Sallotti Earth Science Education award in 2013.

Tony's topics at the conference will include "How New Minerals Are Discovered and Named," using nikischerite as an example; "Minerals of the Kola Peninsula;" and "Rocks from Space."

The registration fee of \$30 includes the three lectures; a Friday evening coffee/tea social with light appetizers; and a Saturday continental breakfast and lunch (deli sandwiches, side dishes, beverages, and dessert).



**Left:** Tony Nikischer. **Right:** Nikischerite, Huanuni Mine, Huanuni, Dalcence Province, Oruro, Bolivia. Source: Wikipedia.

The conference will also include mineral dealers, a silent auction, mineral giveaways, and loads of geology friendship.

You can find registration materials and information at our club Website: [www.dcmicrominerals.org](http://www.dcmicrominerals.org). ➤

## Are You Sure It's Jade?

by Judy Cook

**Editor's note:** The article is from Crack 'n Cab (newsletter of the Gem & Mineral Society of Syracuse, NY), March 2015, p. 5.

**A** chip knocked off the freshly broken surface should not sparkle in the sun. If it does, it's not jade.

If you can scratch it with a knife-point, it isn't jade.

It will be much heavier than a common rock of similar size.

Tap the specimen with a hammer. If a moon-shaped fracture appears, it is agate or jasper, but not jade.

If it is jade, it will have a smooth, waxy, almost greasy look.

The only positive test for jade is X-ray analysis and specific gravity tests. ➤



Unworked jade.  
Source: Wikipedia.



## Sailing Stones

by Fred Haynes

**Editor's note:** The piece is adapted from Wayne County Gem and Mineral Club News (newsletter of the Wayne County Gem and Mineral Club, Newark, NY), December 2014, p. 2.

Let's go to the desert, specifically to the large, generally flat dry lake beds of Death Valley National Park in California. In the Southwest, dry lake beds are known as playas, from the Spanish word for beach. Large rocks are strewn across many playa surfaces, often with long curved tracks, suggesting movement across the desert floor.

In the past, many theories were proposed to explain how the rocks, some as heavy as 700 pounds, could slide or sail across the playas. Scientists suggested that the cause might be hurricane-force winds, muddy playa surfaces, slick algal mats during rare wet periods, or thick ice accumulations. But experiments and models developed with these ideas could not duplicate the phenomena.

After more than 70 years of attempts to solve the mystery of the sailing stones, Boise State professor Brian Jackson and his colleagues finally caught the stones in action. Dr. Jackson installed weather stations with cameras and fitted 15 stones with sensitive motion-activated GPS units. Although the stones can be dormant for decades, a complex set of conditions set the stones into motion in December 2013.

First, rain coated the playa surface with a layer of water. As nighttime temperatures dropped, the pond froze to form thin sheets of ice, thin enough to move freely but thick enough to maintain strength.

The following morning, the ice began to melt and break up into large floating panels, themselves buoyant above the mud surface despite the large rocks atop them. Light winds drove across the playa, pushing the rocks in front of them and leaving trails in the soft mud below the ice rafts.

The GPS and observation cameras revealed that winds on the order of roughly 8 to 10 miles per hour caused the movement; the rock-laden ice rafts moved about 6 to 18 feet per minute.

Who says geology isn't interesting? ➤

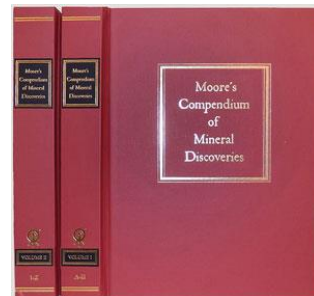


A solitary sailing stone on Raceway Playa in Death Valley, California. Source: Wikipedia.

## Moore's Compendium

Thanks to Sue Marcus for the reference!

For sale: *Moore's Compendium of Mineral Discoveries*, a review of every published mineral discovery since 1960—with more than 1,600 pages in two hard-bound volumes. Offered by *The Mineralogical Record*, only 220 sets remain. For more information, click [here](#).



## When It Rains, It Still Shines

*by Sheryl E. Sims*

**R**ecently, I attended the 52<sup>nd</sup> Annual Gem, Mineral and Fossil Show hosted by the Gem, Lapidary, and Mineral Society of Montgomery County in Maryland. As usual, I enjoyed wandering through the rows of beautiful minerals and seeing familiar faces behind the demonstration and vendor tables.

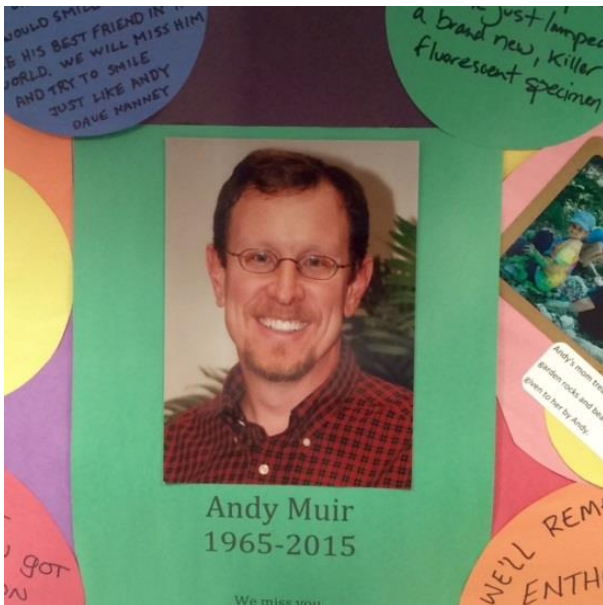
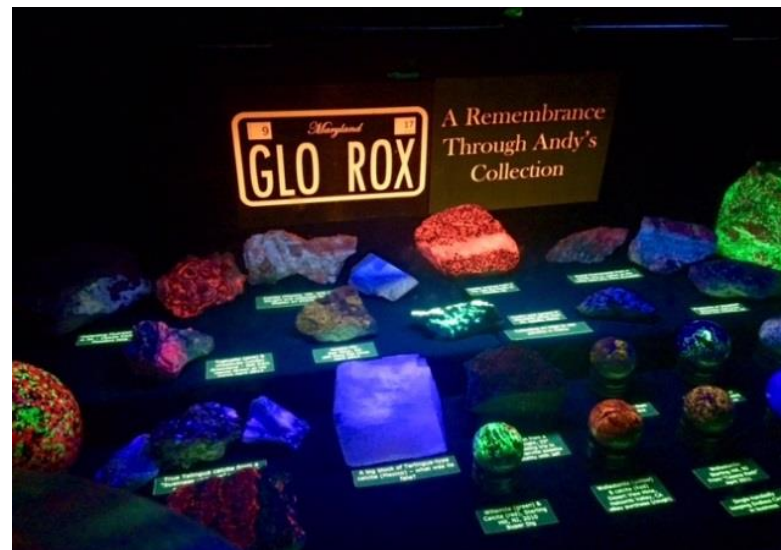
What touched me most—and brought a bit of sunshine to an otherwise rainy day—was the wonderful exhibition case that the Montgomery County club created in memory of their devoted member Andy Muir.

Such sweet messages were left on the colorful notes surrounding his picture! Looking around, I clearly saw how greatly he was missed by his fellow club members and other mineral club friends. People even wore T-shirts with Andy's personalized license plate—GLO ROX.

Everyone who knew Andy knows how much he loved his spheres. His beautiful collection was on display as well.

Seeing all of this was bittersweet, however. I have fond memories of running into Andy at many mineral shows in the past and always taking a picture with him.

Well, this time, I was still able to take a picture with him, only it was a little different this time. We, your friends, miss you, Andy! 📷



*All photos: Sheryl E. Sims.*





## Editor's Corner Newsletter Contest

by Hutch Brown

**E**very year, our regional and national federations hold a newsletter contest. I have been editing our club newsletter since January 2013, and our newsletter has not done well in the contests.

Why not?

Okay, I confess: One time, a judge caught a typo. My bad!

That same judge criticized our newsletter for having *too* many photos! Go figure!

Not that we changed anything, but it shows an element of subjectivity in the newsletter judging. Different editors have different preferences.

However, these are not the real reason why our newsletter has not done well.

The real reason is the judging criteria. If you have a contest with some modicum of objectivity, you need measurable criteria. Makes sense to me!

So what are the judging criteria for the newsletter contest?

As you might expect, some criteria involve the principles of writing/editing and design/layout. These criteria fall under the headings "First Impression" and "Format/Editorship." They count for a total of 44 points out of 100.

And that's a huge improvement. Under the former judging criteria (revised in 2015), far fewer points were directly related to writing/editing and design/layout. I remember counting less than 10.

So having it raised to 44 points is great!

But the remaining 56 points still have to do with newsletter content, and that changes the whole nature of the contest. The contest is not mainly about how well our newsletter is written and designed, but rather about what it contains.

And that makes it a check list.

Does your newsletter contain this element? Great! Five points to Gryffindor! Are you lacking that one? Sorry, Hufflepuff—no points for you!

So what are those mandatory content elements?

They include "Vital Information" (15 points), "Club News" (20 points), "Federation News" (8 points), and "Articles" (13 points).

As editor, I can make sure "Vital Information" (such as the names of club officers) is there. "Articles" (the kind and variety of articles in the newsletter) aren't a problem, either.

Reprinted articles from the EFMLS and AFMS newsletters serve as proxies for "Federation News." That's why our newsletter has them (see the examples in this issue below). Not a bad idea, anyway.

But the editor has little control over most elements of "Club News." Here's where we get docked:

- "Programs announced, previous programs reviewed" (3 points): We always do the former, rarely the latter.
- "Committee/board meeting reports, president's message" (3 points): We almost always have the latter, almost never the former.
- "Field trips, workshops/classes, community/federation projects" (3 points): We rarely have any of these.
- "Coming events, or calendar of club activities" (3 points): See page 15 below for a sample. Do we really need a calendar? Does it actually help?
- "News of members" (2 points): We rarely print personal news about club members.

These "dings" can add up to 14 points. Sorry, Hufflepuff! You lose again!

Do these elements have anything to do with the quality of our newsletter? Of course not!

These judging criteria amount to expectations by our national and regional organizations about what member clubs should be doing. The contest is a way of encouraging clubs to meet those expectations.

But I think our club is fine. We seem to have the organization and activities that our members want.

Therefore, I have decided to stop submitting our newsletter for the contest. I will submit articles for judging this year as usual, but not the newsletter.

If the contest is about federation expectations that our club has no intention of meeting, I don't see the point of participating.

Do you? ➤





## Editor's Corner Update: Newsletter Contest

by Mary Bateman, BEAC Chair

**Editor's note:** The article is adapted from EFMLS News (March 2016), p. 8.

**T**he entries for the 2016 BEAC contest (2015 bulletins) have been received and the judging has been completed.

Twelve clubs entered the contest this year. We had entries in every category except Junior Poetry.

Four of the 10 judges were new this year. Thank you to all the judges for your time.

The past 2 years have been tight on the judging, and we thought we could give the judges a good 6 to 8 weeks to complete their task this year. But the AFMS convention date (earlier than usual) is such that we could give them only 4 weeks.

But they came through! A huge debt of gratitude goes to them all.

By the time you receive this newsletter, the three top entries in most categories will have gone to AFMS for the national contest. Good luck to all whose entries are being passed on.

Since the EFMLS convention isn't until October 21–23, why not plan now to attend? Upstate New York is beautiful that time of year. More will be forthcoming in the EFMLS newsletter regarding the convention—keep an eye out for it.

EFMLS newsletter contest winners will be announced and awards given out at the convention. Some of you might already know that you were a top award winner because AFMS awards will already have been announced.

Just to let you know, I now have my Internet and e-mail back up and running. My e-mail address is [mbateman1@verizon.net](mailto:mbateman1@verizon.net). Feel free to e-mail me with any questions, concerns, and/or even what you would like to see in this column.

Looking forward to hearing from you. In the meantime, enjoy the warmer weather and have a happy spring! 🐣



## Newsletter Articles Submitted

by Hutch Brown, Editor

In December 2015, I chose the following articles from last year's NVMC newsletters to submit for the 2016 BEAC contest. Our club submissions fell into the three contest categories shown below:

### Educational/Technical Articles

*"... includes historical and/or geological information, gives complete (technical) descriptions of the material found, and/or uses research ..."*

Alec Brenner, "Lab Notes: Mineral Identification (the Cool Way)" (October)

Sue Marcus, "Mineral of the Month: Zircon" (March)

Sheryl Sims, "Tribune Tower: A Tower That Rocks" (December)

### Nontechnical Articles

*"... informational rather than technical in nature ... may include things [such] as show critiques, program reviews, book reviews, and editorials ..."*

Hutch Brown, "James Hutton: Father of Geology" (December)

Kathy Hrechka, "Natural History Museum in London: In Search of Smithsonite" (February)

Sue Marcus, "What's a Hole in the Ground?" (September)

### Written Features

*"... add spice to a club bulletin ..."*

Sheryl Sims, "Cold Weather Fun" (February)

Sheryl Sims, "Mineralogy Is a Stitch!" (October)

Wayne Sukow, "The Prez Sez" (April)

Best of luck to all our authors!

To get in on the action, just write an article on your favorite hobby-related topic. I'll run it in one of this year's newsletters and submit your piece in one of the contest categories (the main ones are shown above) for the 2017 BEAC.



## Safety Matters Hidden Dangers



by Ellery Borow, AFMS Safety Chair

**Editor's note:** The article is adapted from the A.F.M.S. Newsletter (June/July 2015), p. 5.

Think of the avid field collector using power tools to drill holes in rocks so that they can be split using feathers and wedges—what a dust cloud! Think of the lapidary artist using her home-made machine with all its exposed drive belts and pulleys—just waiting to grab a loose sleeve cuff. Think of kids in a quarry hammering on a rock—with sharp, splintery, rock shards spraying in all directions.

All the situations just described have obvious dangers—inhaling rock dust; catching clothing, hair, and fingers in equipment; sharp shards damaging eyes. While these hazards are obvious, others may not be.

Think of that avid field collector once again. To arrive at the worksite, he or she may have taken a shortcut and walked across a small stream. Take it from one who knows: Wet rocks can be extremely slippery. Falling and breaking a bone can be very serious.

Soldering on that silver pendant may produce a striking work of art; however, the flux and pickling fumes could be highly toxic. Wandering around a famous quarry to collect fluorescent minerals after dark might get you incredible treasures but you might not see holes of unknown depth. Even a shallow hole can make you lose your balance, especially after dark.

Another underappreciated hazard is losing sight of your fingers. Reaching over a ledge, you might grab an unwelcome critter hiding there out of sight. And losing sight of your fingers as you hold a rock against that slab saw is just asking for pinchpoint trouble. Reaching into a hole to pull out a treasure? Again, take it from one who knows: There could be something else in that hole—something that bites or stings.

Working at that club show or workshop? A simple tester found at most hardware or electrical supply stores can be used to check those outlets, extension cords, and power strips. Whereas circuits either work or not, there might be poor, faulty, or missing grounds, reversed polarities, and nonfunctioning GFCIs that are not so noticeable at a glance.

Always keep in mind the potential of hidden dangers lurking in our rockhound hobby. Keep in mind that it is not just the dark of night that harbors hidden hazards, although night is when the monsters come out, isn't it?

Please be safe in what you do and keep in mind the potential hidden dangers, as well as the not-so-hidden dangers lurking just around the corner. Your safety matters! ↗.

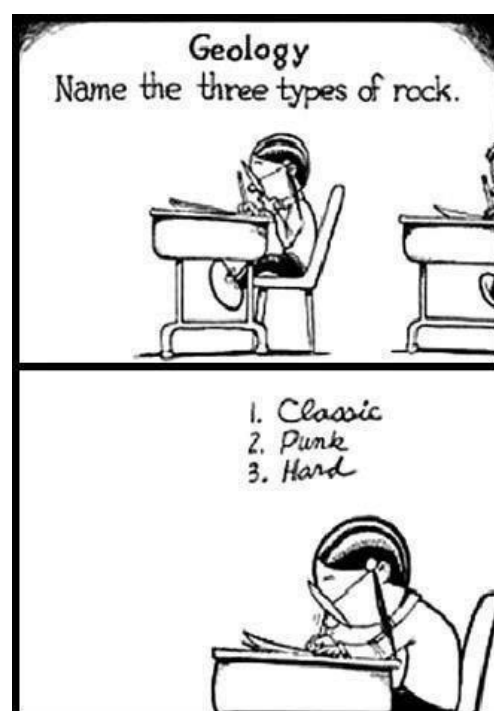
### GeoWord of the Day

(from the American Geoscience Institute)

#### katamorphism

Destructive metamorphism in the katamorphic zone, at or near the Earth's surface, in which complex minerals are broken down and altered through oxidation, hydration, solution, and allied processes to produce simpler and less dense minerals. The term was introduced by Van Hise in 1904. Also spelled: catamorphism. Cf: anamorphism.

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



Source: [JoyReactor](#).





## The Rocks Beneath Our Feet Coastal Plain Marine Deposits

by Hutch Brown

When I went to high school in Fairfax, VA, I had to memorize the geologic provinces in our area. Naturally, I thought of the Coastal Plain as part of our area's landmass, no less than the Piedmont.

In the period we live in, characterized by glacial episodes lasting tens of thousands of years, that makes perfect sense. The Pleistocene ice sheets locked up so much water that sea levels were often far lower than today. The Coastal Plain has long been above sea level.

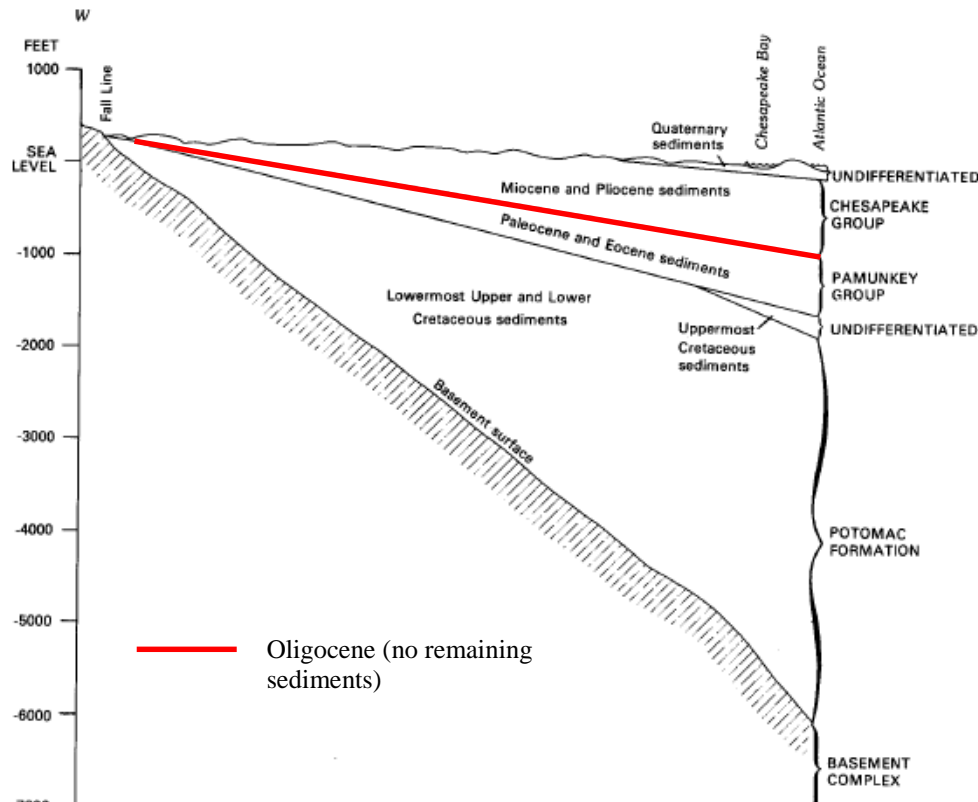
During the early Cretaceous Period (from about 140 million to 100 million years ago), the same was true. The rivers that drained the interior of our area transported materials ranging from cobble to clay and deposited them below the Fall Line. The resulting Potomac Formation of unconsolidated sediments makes up about 70 percent of the sedimentary load on the underlying Cambrian basement rock (fig. 1).

### Coastal Seas

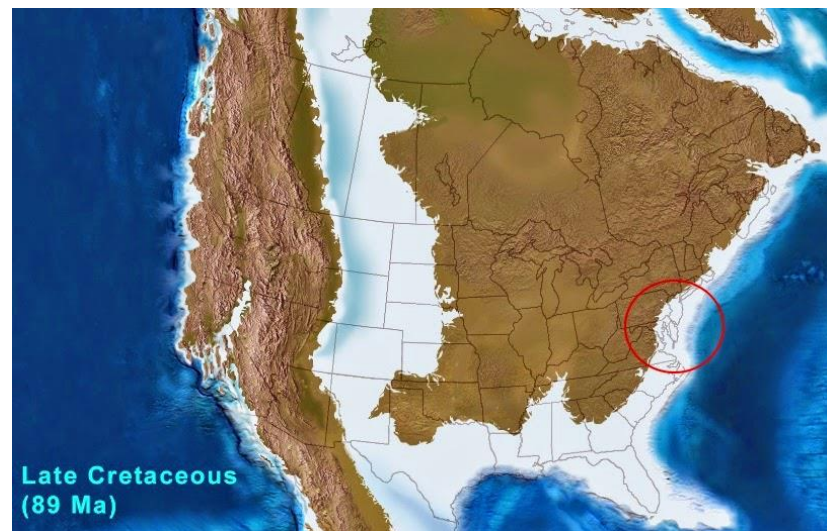
Over the past 100 million years, however, average global temperatures have usually been higher than today. Accordingly, sea levels have also been higher (fig. 2). Large parts of the Coastal Plain have often been covered by shallow marine seas inhabited by corals, shellfish, sharks, and whales. The ancient seas left marine sediments that deeply buried the Potomac Formation (fig. 1).

The seawaters covering the Coastal Plain were by no means continuous. They came and went over millions of years in what geologists call marine transgressions and regressions. During most of the Oligocene Epoch (from about 37 million to 24 million years ago), for example, the Coastal Plain was above sea level, just as it is today.

When the Coastal Plain was above sea level, exposed to wind and weather, it was subject to erosion. As a



**Figure 1—**The Coastal Plain, showing the Cambrian basement rock and the overlying sediments: the riverine Potomac Formation and the marine Tertiary sediments (the Pamunkey and Chesapeake Groups). Source: GMU (2013).



**Figure 2—**During the late Cretaceous Period, shallow seas often covered all or part of the Coastal Plain in our area (circled). Source: Share (2014).

result, the Oligocene Epoch left no traces in the Coastal Plain's sedimentary record (fig. 1). And due to erosion during other marine regressions, the marine formations we see today are often discontinuous—

displaying what geologists call unconformities (gaps in the geological record).

## Sedimentary Groups

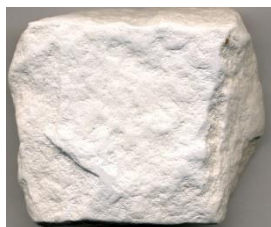
Nevertheless, the marine sediments on the Coastal Plain are of three general kinds:

1. **Late Cretaceous Period** (from about 100 million years ago to 66 million years ago). Thin marine deposits consist of “glaucinitic clays, sandy clays, and chalky marls” (Meng and Harsh 1988). Glaucinite is a phyllosilicate member of the mica group that can form from decaying seashells; glauconitic clays tend to be greenish. Marl is a mixture of clay and calcium carbonate from decayed seashells; as a rock, it is intermediate between mudstone and limestone. Chalky marl has more calcium carbonate in it than clay.



Glaucinite.  
Source: Wikipedia.

2. **Paleocene and Eocene Epochs** (from about 66 million years ago to 37 million years ago). The Pamunkey Group of formations (fig. 1) generally consists of glauconitic sands, silts, and clays, with varying amounts of shells. Some formations contain cemented shells and shell beds; others contain cobbles and boulders of cemented calcium carbonate. The Marlboro Formation appears to be red clay.



Diatomite.  
Source: Wikipedia.

3. **Miocene and Pliocene Epochs** (from about 24 million years ago to 1.6 million years ago). The Chesapeake Group of formations (fig. 1) generally consists of intermixed shelly sands, silts, and clays. The oldest deposits are fine clays and sands with diatomite (diatoms are a kind of hard-shelled algae) and some shells. The youngest deposits (in the Yorktown Formation) contain thick layers of shells.

## Thin Deposits

The late Cretaceous marine deposits are thin and deeply buried; figure 1 shows them as “undifferentiated” and far to the east of the Fall Line. A geologic map of Arlington County, VA, shows none at all.

All deposits near the Fall Line are a thin “feather edge” that gradually thickens to the east, forming a

series of overlying wedges (fig. 1). Except near the Fall Line, the Potomac Formation is visible only in quarries.

The Tertiary terraces near the Long Branch Nature Center, where our club meets, are not marine. Of late Miocene age and riverine in origin, they are similar in composition and appearance to the underlying Potomac Formation.

But you can find marine Tertiary deposits well exposed in places like Calvert Cliffs, MD, and along the James River near Williamsburg, VA. ↗

## Acknowledgment

Thanks to Sue Marcus for reviewing and improving the piece. Any errors are my own.

## Sources

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Yorktown Formation near Williamsburg, VA, with abundant scallop shells. Source: [Pinterest](#).



## Chicago Field Museum

by Michael Hutchins, Ph.D.

**Editor's note:** The piece is abridged and adapted from The Rostrum, (newsletter of the Maryland Geological Society, Baltimore, MD), January 2015, pp. 6–9.

On the weekend of November 7–9, 2014, I traveled to Chicago, IL, to give a presentation and participate in a panel discussion organized by the Chicago Ornithological Society and Chicago Sierra Club. I had some spare time, so I decided to visit one of my favorite natural history museums.

The Chicago Field Museum is located close to historic Soldier Field and the John G. Shedd Aquarium near the shore of Lake Michigan. Given my interest in paleontology, I went to the museum's Evolving Planet exhibit.

### Varied Displays

This extensive exhibit, which opened in March 2006, is a walk through time. It tells the story of the evolution of life on our planet from pre-Cambrian times to the present. In each section, the history of life is illustrated with a combination of incredible painted dioramas, models, interactive exhibits, videos, and an amazing array of high-quality fossils.

Moving through the winding path of the exhibit, one first encounters a bewildering variety of invertebrates, characteristic of the early proliferation of life, including trilobites and eurypterids. Eventually, we see the emergence of fish and then amphibians and reptiles. There are some particularly fine fish, turtle, crocodile, and plant fossils from the Eocene Green River Formation (55 million years ago).



The displays begin with invertebrates such as trilobites and eurypterids.

A large dinosaur hall contains numerous exquisitely preserved specimens, including a complete crested hadrosaur (*Parasaurolophus cyrtocristatus*) specimen from the Cretaceous Period (144 to 65 million years ago). The specimens lie under 15 large murals painted by the world-famous paleoartist Charles Knight.

### Story of Sue—*Tyrannosaurus rex*

However, the crème of the museum's dinosaur collection—the most complete skeleton of *Tyrannosaurus rex* ever found, nicknamed Sue—is located on the main level, in the hall named after Stanley Field, namesake for the museum itself.

The specimen is 40 feet long, stands 13 feet tall at the hips, and is estimated to have weighed more than 8.2 tons when alive. The skull is a replica; Sue's original skull, which weighs 600 pounds, rests in a glass case on the museum's balcony, under a spectacular mural depicting what Sue might have looked like when alive (minus the feathers that T. rex probably had).

This spectacular and highly controversial specimen was recovered by a team from the Black Hills Institute (BHI) in South Dakota led by Pete Larson. The institute obtained permission from the landowner, Maurice Williams, to excavate and remove the skeleton in exchange for a payment of \$5,000.

However, Williams later claimed that the money was not for the sale of the fossil but only to allow BHI to remove and clean the fossil for a later sale. Further complicating the situation, Williams is a member of the Sioux tribe, which subsequently claimed that the bones belonged to the tribe.



The skull of a crested hadrosaur (*Parasaurolophus cyrtocristatus*).

However, the property where the fossil was found was under the jurisdiction of the U.S. Department of the Interior. In 1992, the Federal Bureau of Investigation and the National Guard seized the disputed fossil. The specimen was stored at the Dakota School of Mines and Technology, where it remained pending the outcome of the legal dispute.

The courts eventually decided that Maurice Williams was the rightful owner, and the specimen was returned to him in 1995. Williams subsequently put Sue up for auction. Many were then worried that the fossil would end up in a private collection and never be seen again.

The Field Museum wanted to purchase Sue, but cost was an issue. Fortunately, the California State University system, Walt Disney Parks and Resorts, McDonald's Ronald McDonald House Charities, and individual donors came to the rescue. With their help, the Field Museum purchased Sue with a winning bid of \$8,362,500—the highest price ever paid for a dinosaur fossil.

The entire episode is still controversial and the subject of the film *Dinosaur 13*. The film was produced, directed, and edited by Todd Douglas Miller based on Peter Larson and Kristin Donnan's 2002 book *Rex Appeal: The Amazing Story of Sue, the Dinosaur That Changed Science, the Law and My Life*.

## Age of Mammals

After leaving the dinosaur hall, visitors enter the Age of Mammals exhibit, which contains a large number of specimens from the Pleistocene and Quaternary Periods, including giant sloth, bison, rhinoceros, camel, mastodon, mammoth, Irish elk, and saber-toothed cat, just to name a few. The fossils are exhibited under giant dioramas depicting the animals as they might have looked in life. Visitors are also treated to a depiction of human evolution, including a life-sized replica of *Australopithecus* and a replica of the famous "Lucy" specimen discovered by Donald Johansen.

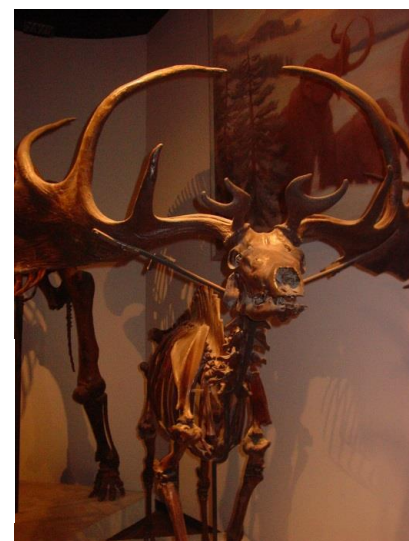
I greatly enjoyed my brief time spent in Evolving Planet and would love to return to go over the exhibits in more detail. I was in a bit of a rush because I had limited time and other exhibits I wanted to see, including the notorious Tsavo lions (which reportedly killed 135 people in 1898 during the building of the Uganda–Kenya railroad); the museum's incredible collection of Northwest Coast Indian art (one of the



Top: *Tyrannosaurus rex* nicknamed Sue; bottom: Sue's teeth.

best in the world); and its exhibition depicting the art and culture of the Pacific (including New Guinea, another interest of mine).

I would highly recommend a visit to the museum next time you are in the Windy City. ↗



Fossil of an Irish elk, megafauna from the Pleistocene, part of the Age of Mammals exhibit at the Field Museum.



## April 2016—Upcoming Events in Our Area/Region (see details below)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2 Shows: NJ; NY; PA
3 Shows: NJ; NY; PA	4	5	6 MSDC mtg, Wash, DC; field trip: Cocklesville, MD	7	8	9
10	11 GLMSMC mtg, Rock- ville, MD	12	13	14	15	16 Show: Severna Park, MD
17	18	19	20	21	22 MNCA show, Alexan- dria, VA  Earth Day	23 MNCA show; show: Og- densburg, NJ
24 Show: Ogdens- burg, NJ	25 NVMC mtg, Arlington, VA	26	27 MNCA mtg, Arlington, VA	28	29	30 Field trip: Stratford Hall, VA

### Event Details

**2–3: Midland Park, NJ**—27<sup>th</sup> Annual North Jersey Gem, Mineral and Fossil Show (formerly The Clifton Show); Sat 10–6, Sun 10–4; new location: Midland Park High School, 250 Prospect Street; info: [www.nojms.webs.com](http://www.nojms.webs.com).

**2–3: Johnson City, NY**—47<sup>th</sup> Annual Gem, Jewelry, Mineral & Fossil Show; NY Southern Tier Geology Club; Johnson City Senior Center, 30 Brocton St.

**2–3: Plymouth Meeting, PA**—16<sup>th</sup> Mineral Treasures and Fossil Fair, 2016 Annual Show; the Philadelphia Mineralogical Society and the Delaware Valley Paleontological Society; LuLu Temple, 5140 Butler Pike (2 miles from the Norristown exit of the PA Turnpike); Sat 10–5, Sun 10–4; adults \$5, kids under 12 \$1, uniformed Scouts free; info: [www.philamineralsociety.org](http://www.philamineralsociety.org).

**6: Washington, DC**—Monthly meeting; Mineralogical Society of the District of Columbia; 1<sup>st</sup> Wednesday of the month, 7:45–10; Smithsonian Natural History Museum, Constitution Avenue lobby.

**6: Cocklesville, MD**—Field trip; Bluegrass Texas Quarry; signup deadline April 6; info: Sam Linton at [cooldragonshirts@yahoo.com](mailto:cooldragonshirts@yahoo.com).

**11: Rockville, MD**—Monthly meeting; Gem, Lapidary, and Mineral Society of Montgomery County;

2<sup>nd</sup> Monday of the month, 7:30–10; Rockville Senior Center, 1150 Carnation Drive.

**16: Severna Park, MD**—Annual Jewelry Gem and Mineral Show; Patuxent Lapidary Guild, Inc., Earleigh Heights VFC, Rte. 2, Severna Park, MD; Sat 10–5; over 10 years old \$2, under 10 free.

**22–23: Alexandria, VA**—43<sup>rd</sup> Atlantic Micromounters' Conference; Micromineralogists of the National Capital Area; SpringHill Suites by Marriott, 6065 Richmond Hwy; Fri 6–9 p.m., Sat 8:30–9; preregistration fee \$30 (before April 15), \$35 at the door; info: [www.dcmicrominerals.org](http://www.dcmicrominerals.org)

**23–24: Ogdensburg, NJ**—Sterling Hill Super Dig; Delaware Valley Earth Science Society; Sterling Hill Mining Museum; info: [www.dvess.org](http://www.dvess.org).

**25: Arlington, VA**—Monthly meeting; Northern Virginia Mineral Club; 4<sup>th</sup> Monday of the month, 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.

**27: Arlington, VA**—Monthly meeting; Micromineralogists of the National Capital Area; 4<sup>th</sup> Wednesday of the month, 7:45–10; Long Branch Nature Center, 625 S Carlin Springs Rd.

**30: Stratford Hall, VA**—Field trip; beach fossil collecting; \$50 per person.



**Mineral of  
the Month:  
Sulfur**

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

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## **The Northern Virginia Mineral Club**

You can send your newsletter articles to:

[news.nvmc@gmail.com](mailto:news.nvmc@gmail.com)

**Visitors are always welcome at our club  
meetings!**

**RENEW YOUR MEMBERSHIP!**

**SEND YOUR DUES TO:**

Rick Reiber, Treasurer, NVMC  
PO Box 9851, Alexandria, VA 22304

**OR**

Bring your dues to the next meeting.

**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, <http://www.amfed.org/efmls>) and the American Federation of Mineralogical Societies (AFMS, <http://www.amfed.org>).

**Dues:** Due by January 1 of each year; \$15 individual, \$20 family, \$6 junior (under 16, sponsored by an adult member).

**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.*

### **2016 Club Officers and Others**

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