



# **OUTCROPPINGS**

**February 2021**

www.semmlc.com

Incorporated April 8, 1970

**Meetings held on the second Thursday of each month at 7:30pm (excluding July and August)  
in Room 130 of the Conant Science Building at Bridgewater State University,  
14 Park St., Bridgewater, MA**

**President:** Julie Morales **Email:** juliesemmlc@gmail.com

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## **January 2021 SEMMLC Meeting will be held on ZOOM**

Due to the COVID-19 pandemic, SEMMLC will be holding our regular monthly meetings, the 2<sup>nd</sup> Thursday of the month, via Zoom at 7:30pm. The next meeting is **Thursday, February 11<sup>th</sup>, 2021 at 7:30pm Zoom Meeting ID number is: Meeting ID: 826 6632 9717 and the Passcode is: 973769**

To ensure a pleasant experience with your Zoom Meeting, we highly encourage individuals to download and install the Zoom Application beforehand.

To download and install the Zoom Application:

Go to <https://zoom.us/download> and from the Download Center, click on the Download button under "Zoom Client For Meetings".

This application will automatically download when you start your first Zoom Meeting.

Once the download is complete, proceed with installing the Zoom application onto your computer.

### **ZOOM MEETING QUICK LINK**

Join Zoom Meeting

<https://us02web.zoom.us/j/82666329717?pwd=MkdOWkZaR0ZQcm54OVM4b1pWSE1aZz09>

### **A MESSAGE FROM THE PRESIDENT**

To my fellow rockhounds,

I hope everyone is staying safe, healthy and warm! The Southeastern Massachusetts Mineral Club only exists because of YOU; the members. To each and every one of YOU, please know that: YOU are

valuable, YOU matter, YOU are impactful, worthy, and important. Please know that I will always make myself available to anyone that wants to talk, text, or email.

What have you been doing with this extra time at home? Besides taking care of our farm and family, I've been organizing, sorting, and labeling some of my personal collection. Did you know SEMMC has blank mineral identification cards available? They are perfect for labeling specimens found on field trips! As always, please send me an email if you need some. I'm also excited to announce that we will be having a few items up for auction on our Facebook page and will be raffling off a few specimens on our next Zoom meeting! I hope to see you there! I look forward to the day (hopefully, wicked soon) when we can gather and have our awesome in-person meetings! Until then, stay safe and I'll see you on Zoom!

Julie Rosenthal Morales  
SEMMC President

### **Message from the Editor**

#### **WE WILL BE ONLY BE PRODUCING AN EMAIL EDITION OF THE SEMMC NEWSLETTER**

As the editor I will be looking for club members input. If you see a geology article, know of an upcoming rock and mineral show, or just have an idea of something that you would like to see in the newsletter please email me at [jbradleysemmc@gmail.com](mailto:jbradleysemmc@gmail.com)

Thank you and happy collecting  
Jim Bradley

### **Field Trip Agenda**

Field collecting trips are open to SEMMC members only, as our insurance policy covers members only. Please bring your SEMMC Membership card with you. All participants of field trips are required to contact trip leaders at least 48 hours in advance of trip date.

*Schedules may change. Please contact the host to confirm date, time and details.*

Some trips may be eliminated, added, or altered depending on weather and other circumstances.

However, please remember we do have a club claim in Fonda, NY and it is open year-round, weather permitting.

**SEMMC club claim at Diamond Acres in Fonda, NY** is there for our enjoyment. Please use it and follow the rules of use, which are pretty simple. All debris **must** be removed after digging. There is **no dumping** of material in the claim. Please place all stone and dirt outside of the roped off areas. No sifting soil anywhere except in the designated sifting area. There is to be no undercutting of trees. The large tree with stone under it is OFF LIMITS...NO EXCEPTIONS!!! Please work in a safe manner and enjoy yourself.

### **SEMMC Stickers and Patches Are Now Available**

SEMMC stickers and patches are now available. Stickers are \$5 each while the patches will be sold for \$3. Our digging season is now upon us. See Julie Morales at the meeting or contact her by email [juliesemmc@gmail.com](mailto:juliesemmc@gmail.com) Enjoy the season!

## Mineral of the Month

### Plumbogummite



Locality: Yangshuo Mine, Yangshuo Co., Guilin Prefecture, Guangxi Zhuang Autonomous Region, China (Collector's Edge Image)

<b>Category</b>	Phosphate minerals
<b>Formula</b> (repeating unit)	$\text{PbAl}_3(\text{PO}_4)_2(\text{OH})_5 \cdot \text{H}_2\text{O}$
<b>Strunz classification</b>	8.BL.10
<b>Dana classification</b>	42.7.3.5
<b>Crystal system</b>	Trigonal
<b>Crystal class</b>	Hexagonal scalenohedral (3m) H-M symbol: (3 2/m)
<b>Space group</b>	R3m
<b>Identification</b>	
<b>Formula mass</b>	581.14 g/mol
<b>Color</b>	Blue, grey, greenish or yellow
<b>Crystal habit</b>	Crystals, rare, have a hexagonal outline
<b>Cleavage</b>	None
<b>Fracture</b>	Uneven or sub-conchoidal
<b>Tenacity</b>	Brittle
<b>Mohs scale hardness</b>	4 to 5 or 4.5 to 5
<b>Luster</b>	Resinous or dull
<b>Streak</b>	White
<b>Diaphaneity</b>	Translucent
<b>Specific gravity</b>	4.014
<b>Optical properties</b>	Uniaxial (+), segments of crystals may be biaxial
<b>Refractive index</b>	$n_o = 1.653$ or $1.653$ to $1.688$ $n_e = 1.675$ or $1.675$ to $1.704$ $n_o = 1.722$ and $n_e = 1.742$ for Ga-rich plumbogummite
<b>Pleochroism</b>	None
<b>Solubility</b>	Soluble in hot acids

**Other characteristics** Non-fluorescent, not radioactive

**Plumbogummite** is a rare secondary lead phosphate mineral, belonging to the alunite supergroup of minerals, crandallite subgroup. Some other members of this subgroup are:

- Crandallite,  $\text{CaAl}_3(\text{PO}_4)_2(\text{OH})_5 \cdot \text{H}_2\text{O}$ , where calcium replaces lead

- Goyazite,  $\text{SrAl}_3(\text{PO}_4)(\text{OH})_5 \cdot \text{H}_2\text{O}$ , where strontium replaces lead
- Philipsbornite,  $\text{PbAl}_3(\text{AsO}_4)_2(\text{OH})_5 \cdot \text{H}_2\text{O}$ , where the arsenate group  $\text{AsO}_4$  replaces the phosphate group  $\text{PO}_4$

Plumbogummite was discovered in 1819<sup>[1]</sup> and named in 1832 from the Latin "plumbum" for lead, and "gummi" for gum, in allusion to its lead content and appearance, which at times resembles coatings of gum.

#### Unit cell

Plumbogummite crystallizes in space group R3m. The reported lattice parameters (the lengths of the sides of the unit cell) vary in detail according to the source, but all agree that normal plumbogummite has "a" close to 7 Å and "c" close to 17 Å, with Z=3. Various reported values of "a" and "c" are:

a = 7.01 Å, 7.017 Å, 7.018 Å, 7.033 Å

c = 16.71 Å, 16.75 Å, 16.784 Å, 16.789 Å

Mills *et al.* investigated a gallium-rich sample of plumbogummite from Tsumeb, Namibia, and found larger cell parameters, with a = 7.0752 Å and c = 16.818 Å.

#### Structure

The basic structural units of plumbogummite are  $\text{PO}_4$  tetrahedra, with phosphorus atoms (P) at the center and oxygen atoms (O) at the corners, together with  $\text{AlO}_6$  octahedra, aluminium atoms (Al) at the center and oxygen atoms at the corners. The tetrahedra and octahedra combine by sharing corners, to form composite layers. Lead atoms (Pb) occupy sites between the layers.

#### Environment

Plumbogummite is found in the oxidized zones of lead-bearing deposits. It commonly occurs as botryoidal, kidney shaped, stalactitic or globular crusts or masses, frequently with a concentric structure; rare crystals have a hexagonal outline. Pyromorphite and baryte are common associated minerals, and plumbogummite may be pseudomorphic after them. Other associated minerals include mimetite, duftite, cerussite, anglesite and wulfenite.

#### Occurrence

The type locality is Huelgoat, Finistère, Brittany, France, and the type material is stored in the Natural History Museum, Paris, France.

Plumbogummite has been found in the Central Cobar Mines, New South Wales, Australia and the Nifty Copper Mine, Western Australia. Also in the Kintore open cut at Broken Hill, New South Wales, Australia, but it is generally inconspicuous there and only a few specimens have been collected.

Material from the Siglio XX Mine, Llallagua, Bolivia, is an unusual pale yellow color, rather than the more common blue or green, forming crusts on quartz and cassiterite, and enclosing crude octahedral jeanbandyite crystals with orange colored shells of plumbogummite.

## Geology Article

### **Diving into Devonian seas: Ancient marine faunas unlock secrets of warming oceans**

January 27, 2021

Syracuse University

Original written by Rob Enslin



Professor Cathryn Newton studies Middle Devonian marine faunas (such as these brachiopods from 380-390 million years ago), whose fossils are lodged in a unit of bedrock in Central New York. Credit: Syracuse University

### **Members of Syracuse University's College of Arts and Sciences are shining new light on an enduring mystery -- one that is millions of years in the making.**

A team of paleontologists led by Professor Cathryn Newton has increased scientists' understanding of whether Devonian marine faunas, whose fossils are lodged in a unit of bedrock in Central New York known as the Hamilton Group, were stable for millions of years before succumbing to waves of extinctions.

Drawing on 15 years of quantitative analysis with fellow professor Jim Brower (who died in 2018), Newton has continued to probe the structure of these ancient fossil communities, among the most renowned on Earth.

The group's findings, reported by the Geological Society of America (GSA), provide critical new evidence for the unusual, long-term stability of these Devonian period communities. Such persistence, Newton says, is a longstanding scientific enigma. She and her colleagues tested the hypothesis that these ancient communities displayed coordinated stasis -- a theory that attempts to explain the emergence and disappearance of species across geologic time. Newton and Brower, along with their student Willis Newman G'93, found that Devonian marine communities vary more in species composition than the theory predicts. Newton points out that they sought not to disprove coordinated stasis but rather to gain a more sophisticated understanding of when it is applicable. "Discovering more about the dynamics of these apparently stable Devonian communities is critical," she says. "Such knowledge has immediate significance for marine community changes in our rapidly warming seas." Since geologist James Hall Jr. first published a series of volumes on the region's Devonian fossils and strata in the 1840s, the Hamilton Group has become a magnet for research scientists and amateur collectors alike. Today, Central New York is frequently used to test new ideas about large-scale changes in Earth's organisms and environments.

During Middle Devonian time (approximately 380-390 million years ago), the faunal composition of the region changed little over 4-6 million years. "It's a significant amount for marine invertebrate communities to remain stable, or 'locked,'" explains Newton, a professor in the Department of Earth and Environmental Sciences.

She, Brower and student researchers spent years examining eight communities of animals that once dwelled in a warm, shallow sea on the northern rim of the Appalachian Basin (which, eons ago, lay south of the equator). When the organisms died, sediment from the seafloor began covering their shells and exoskeletons. Minerals from the sediment gradually seeped into their remains, causing them to fossilize. The process also preserved many of them in living position, conserving original shell materials at some sites.

These fossils currently populate exposed bedrock throughout Central New York, ranging from soft, dark, deep-water shale to hard, species-rich, shelf siltstone. "Communities near the top of the bedrock exhibit more taxonomic and ecological diversity than those at the bottom," Newton says. "We can compare the community types and composition through time. They are remarkable sites."

Coordinated stasis has been a source of contention since 1995, when it was introduced. At the center of the dispute are two model-based explanations: environmental tracking and ecological locking.

Environmental tracking suggests that faunas follow their environment. "Here, periods of relative stasis are flanked by coordinated extinctions or regional disappearances. When the environment changes, so do marine faunas," says Newton, also Professor of Interdisciplinary Sciences and Dean Emerita of Arts and Sciences.

Ecological locking, in contrast, views marine faunas as tightly structured communities, resistant to large-scale taxonomic change. Traditionally, this model has been used to describe the stability of lower Hamilton faunas.

Newton and her colleagues analyzed more than 80 sample sites, each containing some 300 specimens. Special emphasis was placed on the Cardiff and Pecksport Members, two rock formations in the Finger Lakes region that are part of the ancient Marcellus subgroup, famed for its natural gas reserves.

"We found that lower Hamilton faunas, with two exceptions, do not have clear counterparts among upper ones. Therefore, our quantitative tests do not support the ecological locking model as an explanation for community stability in these faunas," she continues.

Newton considers this project a final tribute to Newman, a professor of biology at the State University of New York at Cortland, who died in 2014, and Brower, who fell seriously ill while the manuscript was being finalized. "Jim knew that he likely would not live to see its publication," says Newton, adding that Brower died as the paper was submitted to GSA.

She says this new work extends and, in some ways, completes the team's earlier research by further analyzing community structures in the Marcellus subgroup. "It has the potential to change how scientists view long-term stability in ecological communities."

**Journal Reference:**

1. Cathryn R. Newton, Willis B. Newman, James C. Brower. **Quantitative paleoecology of marine faunas in the lower Hamilton Group (Middle Devonian, central New York): Significance for probing models of long-term community stability.** *GeoScience World*, 2021 DOI: [10.1130/2020.2545\(09\)](https://doi.org/10.1130/2020.2545(09))

Syracuse University. "Diving into Devonian seas: Ancient marine faunas unlock secrets of warming oceans." ScienceDaily. ScienceDaily, 27 January 2021. <[www.sciencedaily.com/releases/2021/01/210127140129.htm](http://www.sciencedaily.com/releases/2021/01/210127140129.htm)>.

## The Funnies

*Collecting rocks is a fun hobby ...  
you can never have too many  
things to throw at people.*



## We Need Volunteers

Every club is only as successful as those people who give of their time to make it so. Our club is no different. Currently, we need people to step up and volunteer to fill some very important positions. The President has appointed chairpersons for the following committees: Field trip committee, Nominating committee (to be appointed during April), Program committee, Refreshment committee, Publicity committee, Historical committee, Quartermaster committee, and any other committee deemed necessary. If anyone is interested in volunteering for any of the committees, please contact the committee chairperson.

## Membership Renewal

Your dues help keep us going. Dues pay for the newsletter, correspondence, refreshments, speakers, and a host of other expenses. Dues are as follows:

**-Individual Membership \$15.00 Yearly Dues with e-mail newsletter-**

**-Family Membership \* \$20.00 Yearly Dues with e-mail newsletter-**

**\* Family Membership must list all family members as of September 1 of the membership year.**

**Tear off and return with your payment made out to SEMMC, Inc.**

Date \_\_\_\_\_ Name(s) \_\_\_\_\_

Name(s) and Age(s) of children \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip code \_\_\_\_\_

Phone(s) \_\_\_\_\_ Email address \_\_\_\_\_

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