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# THE LAKE AGASSIZ ROCK HOUND

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## Lab mineral created that captures CO<sub>2</sub>

A new technique might one day help combat global warming

[redacted from full article at: > <https://www.sciencenews.org/article/lab-mineral-magnesite-captures-carbon-dioxide>]

Scientists are one step closer to a long-sought way to store carbon dioxide in rocks.

A new technique speeds up the formation of a mineral called magnesite that, in nature, captures and stores large amounts of the greenhouse gas CO<sub>2</sub>. And the process can be done at room temperature in the lab, researchers reported August 14 at the Goldschmidt geochemistry conference, held in Boston. If the mineral can be produced in large quantities, the method could one day help fight climate change.

"A lot of carbon on Earth is already stored within carbonate minerals, such as limestone," says environmental geoscientist Ian Power of Trent University in Peterborough, Canada, who presented the research. "Earth knows how to store carbon naturally and does this over geologic time. But we're emitting so much CO<sub>2</sub> now that Earth can't keep up."

A likely candidate carbonate is magnesite. In the recent past, attempts to make bulk quantities of carbonates have involved pumping CO<sub>2</sub> deep into Earth's interior. There, heat and pressures push the gas into upper-mantle, magnesium rich olivine. This creates magnesite. A metric ton of magnesite can contain about half a metric ton of the greenhouse gas. Difficulties include finding the right locations to insert the CO<sub>2</sub> and the costs of equipment transportation.

Another option is to try laboratory methods using olivine as a base. The enrichment process works quickly under very high temps, but demands great energy at enormous costs.

Natural methods have been observed at work in northern British Columbia. There, arid basins of rock, high in olivine, have had groundwater circulating thru them. Magnesium and carbonate ions settle out of the water, creating magnesite. But it has taken this cooler process 11,000 years. "We knew it was slow, but no one had ever measured the rate." Power says.



Magnesite illustration from the Science News article



Magnesite Crystal from a mine in Austria

To make the rock in the lab, Power and colleagues put magnesium into water. When that happens the water molecules attach themselves to the magnesium ions. That "shell" of water molecules blocks the magnesium and carbonate ions to form magnesite. "It's difficult to strip away those water molecules," Power says. "That's why magnesite forms very slowly."

To get around this, Power and his colleagues used thousands of tiny polystyrene microspheres to speed up the reaction. The microspheres were coated with carboxyl that pulls the water molecules away; and frees up "mag" & "carb" ions to bond with one another. Thanks to these microspheres, the crew managed to make magnesite in just about 72 days. Theoretically, he adds, the microspheres would also be reusable, as the spheres weren't used up by the experiments.

The technique still isn't ready for prime time, Power says. So far, only about a microgram or so has been created in the lab. "We're very far away from commercial upscaling," Powers says. "But it's possible to manage at room temperature. We want to better understand some of the fundamental science" in magnesite formation, he adds.

**Please Come to the LARC**

**October 2018 Meeting**

**Wednesday Oct 3, 7:00 pm  
Stevens Hall Room 136, NDSU**

**Program:**

**Fascinating DVD presentation.  
We'll have the overhead projector  
up and running thanks to Jesse Rock!**

**Guests are always welcome!**

# Lake Agassiz Rock Club

**President:** Frank Svezia  
**Vice President:** Nina Flippance  
**Treasurer:** Terry Mallick  
**Secretary:** Chris Patenaude  
**Youth Group/Pebble Pups:** Nina Flippance  
**Program planning ideas/volunteers welcome**

## What is our Purpose?

To create an interest and promote a knowledge of all phases of geology or earth sciences in an informal setting.

## Where and When Do We Meet?

The Geology Lab, Room 136, on the lower level of Stevens Hall, NDSU, Fargo. Time: 7:00 p.m.

[From N.University Dr. turn West on 12<sup>th</sup> Ave N. Turn North on Bolley Dr. Drive just past Centennial Boulevard. See **Stevens Hall** on west side of Bolley, 2<sup>nd</sup> hall from the corner. To park, go into next driveway ahead, on the left. Drive west, then left again behind a laboratory building to Stevens Hall back-lot.]

## How Much Are the Dues?

Single person—\$20.00; Family—\$30.00; College (any school) students and youth (if not a family member)—\$10.00 per year. Send dues to Terry Mallick, Treasurer; 416 3rd Avenue S., Moorhead, MN 56560. Or contact him during regular meetings.

## What Happens at Meetings?

Our youth group The Pebble Pups attend their own separate group meeting, while the adults cover business. The kids join us for the main Program; a silent auction of collectable minerals; and "lunch".

## What are some of our Club Activities?

Field trips are taken to areas ND, SD, and MN. We fundraise at the R.R.V. Fair. LARC sponsors a scholarship to an outstanding Geology student at NDSU each year. Personal Info lessons can be arranged for pre-meeting times. Lots of Show & Tell at meeting nights!

## What are Our Club Affiliations?

We are affiliated with the American Federation of Mineralogical Societies. (AFMS) We are in the subsector Midwest Federation of the Mineralogical and Geological Societies. (MWF)

## How Do We Keep in Touch?

Website: > <http://www.lakeagassizrocks.com/> <

Facebook: > [lakeagassizrocks.com/about.php](http://lakeagassizrocks.com/about.php) <

The Lake Agassiz Rock Hound is our monthly bulletin e-mailed 7 days before meetings. Paper copy free to active members **without** computer access. \$15 dollar subscription/ yr. for hardcopy to members who want one in addition to their e-addy. **Send news tips and articles** to the editor: Chris Patenaude P.O.Box 434, Perley, MN 56574 or email [LakeAgzRC70@yahoo.com](mailto:LakeAgzRC70@yahoo.com). Rock Hound articles may be reprinted if full credit is given, unless otherwise noted.

LARC is an all-inclusive, diverse group. We welcome and respect every person in regard to age, gender, heritage, language, social class or disability. Discrimination or ill will towards another will not be tolerated. We are here to support any and all who love the hobby.

## Minutes from September 5<sup>th</sup>, 2018 Meeting

Submitted by Chris Patenaude, Secretary

Meeting opened at 7:35 PM. All officers present. New members in the room: Jason P., kids Natalie & Gavin; Jess T. and son Zac; Monica O., her boy Micah and Monica's brother Aiden. Welcome! [Pebble Pups, parents and Nina F., our Youth Director, went to their separate meeting.]

It is costing \$600+ a year to print a paper version of the Rock Hound for all members. 85% of the club is active on the internet. The Rock Hound will now be an e-version .pdf mostly. Any member with e-mail will get the RH that way and can print their own paper copy. The small group of members who truly **do not** have their own addy (or access to internet by household crew) will, without discrimination, get their regular paper copy with a stamp, in the USPS mail. Those members who have access to an e-mail, but still want the 11X17 product from the commercial printer, can get the **\$15/yr.** subscription. Amy H. moves approval, Dan E. 2<sup>nd</sup> s. Ayes.

Treas' Rept on RRVFair "Prospecting" outcomes. Heatwave chopped numbers over whole week. RRVF schedule was a day shorter. RRVF will no longer supplement tables or chairs. So our set-up spent funds a bit.. benches, poster lamination, misc stuff. Even so, we sold more shirts this year. It was a good, average bottom line for the fundraiser. No records, but well accounted. This shows our popularity as a novel exhibit and anticipated activity. Merle H. moves to approve Treas Rpt; Dan E. 2<sup>nds</sup>. Ayes.

Amy H. also volunteers with Autism outreach. She took the LARC's Prospecting Activity materials to an organized Picnic for that group. There was no "profit" being sought, it was for the kids' benefits to see and learn new things. The upside is the fantastic exposure to LARC name and awareness. "Word of mouth is worth gold!"

Meeting minutes Sept 2018 continued on Pg. 3

## BRAD'S BENCH TIPS

Sometimes you have a little discoloration or debris to clean from the bottom of a pocket, from an area of coarse textured surface, or from a small space between two soldered objects. Finding something to get into those close areas is always an effort in creativity.

One tool I have for these special occasions is a glass fiber spot sanding brush. It's great for cleaning a small area and doesn't leave deep scratches, only a faint satin finish.

There are probably several manufacturers of these pens, but one is the PrepPen Adjustable Sanding Pen selling for US\$ 10.95 from Amazon. You can see it at

<http://www.amazon.com/Prep-Pen-PrepPen-Adjustable-Sanding/dp/B000J18RT6/>



Discover New Jewelry Skills With Brad's "How To Do It" Books  
[Amazon.com/author/bradfordsmith](https://www.amazon.com/author/bradfordsmith)

A new volume is available now on Amazon. "More Bench Tips" includes 86 additional ways to save time, avoid frustration and improve quality at the bench. See a sample chapter at <https://amzn.to/2KCvgh4>

## Meeting minutes Sept 2018 continued

Tony F. is in TX, no News or notes on the Website.

Merle H. has **The Club Trailer** at his place for the moment. So far it has been 'couch surfing' between his and Dan's back lots on a per needs basis. To be a legal street creature, it still needs proper license plates. Merle and Sue are selling their house, so **TCT** will be moving again.

Dreaming for the future, we start discussion on Some Day holding our own Rock Show. One suggestion might be to approach a nearby municipal town or village for 'space'... a corner of a city park with trees, or a day in their Community Hall or set up down the middle aisles or 'courtyard' of their mini-mall...

The show could be touted as both a "Fair" and an Educational Event. Participating, invited vendors from all over would pay for the footprint with their own entry fees. Advertising efforts for those vendors would be the keystone to supporting everything else. We might begin with exploratory letters of suggestion to the Rock Club communities of MWF at large, to see if there is interest in their coming to the FM metro area.

Reminder that the new meeting time starts at 7:00 PM now, to help accommodate the Pebble Pups attendance.

The October sealed envelope auction for the Lapidary Combo Unit was discussed again. Out-of-towners send only bids in the mail, no money or checks. The envelopes will not be opened until the October meeting. Bidding will continue at the October 3<sup>rd</sup> meeting with sealed envelopes dropped in a closed box. Non-bidding officers will collect, take aside, open and tally the bids to announce the highest bid winner.

Dr. Jesse Rock from NDSU lecturing staff has given Frank some instructions on how to go to a head security office & get a temporary password to run the room computer. Still needing a sponsor to simplify the process; (access to overhead projector.)

Over at NDSU Stevens Hall, we are getting quite cramped for space as a group! We've outgrown the standard classroom that echoed not four years ago. Negotiations with NDSU has led to a possibility of us getting into room 230, later. It holds 48 in adult-sized individual desks. We might ask for a full conference table and chairs on the side. Jesse says she'll do what she can to help facilitate the proposal.

An article in the September Rock Hound covered the need for an official resolution of Club diversity acceptance and welcome. The first wording addressed a specific incident as example of discrimination and why it was necessary to face the acceptance issue square on. Some folks took it as a personal affront instead of the intended generic presentation. Discussion and conversation ironed out any misunderstandings. This valuable exchange has led to the official statement now presented at the bottom of the Newsletter "static panel".

As we expand in number, there will be physically challenged members who can't manage the east end stairs. Since NDSU considers it a major security risk to leave the 'back door' propped open after hours, we need to work out a "doorman" process. The new entrance is accessible and opens onto the elevator lobby. Anyone with buckets of rocks knows how handy that can be, legs or backs that work well or not! To be discussed at next meeting.

Motion carried to close, Ayes.



## Pebble Pups Action Corner

Last month, the Pups started learning about fossils! We explored many different fossils that formed in different ways. We tried to group the fossils by trace fossils and non-trace fossils. Then we divided into two groups. One group made 'amber' slime. We added glitter 'pollen' and some plastic spiders. The other group got to play with our favorite little handheld microscope that puts images on the computer to examine the fossils we used earlier. In case anyone is wondering, it is the Zoomy Handheld Digital Microscope by Learning Resources.

This month, the Pups will be having a Show, Tell, & Trade! Pups, bring your collectables! Each pup can choose 2-3 of their favorite pieces to show and tell about. The microscope will be on hand too! Then the pups will need to pick one piece from their collection to report on to the adults at the November meeting. I'll have plenty of presentation ideas to help them get started. I can't wait to see what they come up with!

Rockhounds, here's how you can support your Pups this month during the fellowship: Ask to see their collections! Help them identify unknown pieces. Bring a favorite piece from your collection to show them.



## Fat from 558 million years ago reveals earliest known animal

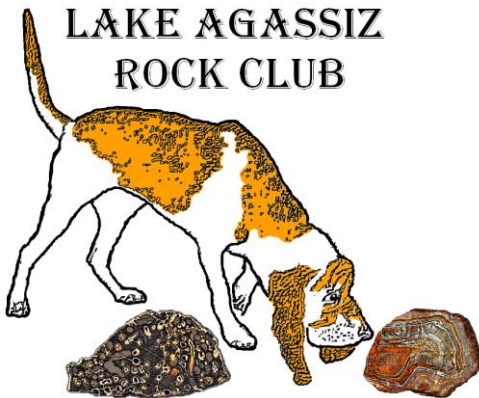
<https://www.sciencedaily.com/releases/2018/09/180920160954.htm>

Scientists from The Australian National University (ANU) have discovered molecules of fat in an ancient fossil to show the earliest yet known animal in the geological record. It lived on Earth 558 million years ago. The strange creature called *Dickinsonia*, grew up to 1.4 metres (about 4 feet) in length. It was oval shaped with rib-like segments running along its body, and part of the Ediacara Biota that lived on Earth 20 million years before the 'Cambrian explosion' of modern animal life.

ANU PhD scholar Ilya Bobrovskiy discovered a *Dickinsonia* fossil so well preserved near the White Sea (in Russia) that the tissue still contained molecules of cholesterol, a type of fat that is the hallmark of animal life.



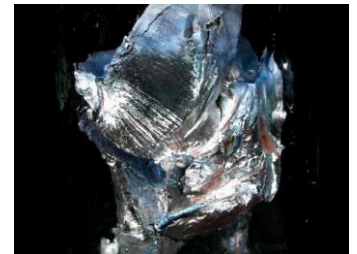
Lake Agassiz Rock Hound  
P.O. Box 434  
Perley, MN 56574



## Minerals for Your Health

### Potassium

Potassium has long been known to regulate blood pressure levels. A diet rich in fruits and vegetables can help you reach the recommended daily value of potassium, 4,700 mg. While bananas are high in potassium, potatoes actually have about twice as much potassium in the typical serving.



### Selenium

is an essential trace mineral that is important for many bodily processes, including cognitive function, a healthy immune system, and fertility in both men and women. It contributes to thyroid hormone metabolism, and it helps protect against oxidative damage and infection. It is present in human tissue, mostly in skeletal muscle. Dietary sources include Brazil nuts, seafood, and meats. The upper limit per day for selenium is 400 mcg for adults. Selenium toxicity is rare, but an overdose of highly concentrated supplements could have negative effects.



### Magnesium

is a mineral found naturally in dark green vegetables, nuts and whole grains. A deficiency of Magnesium has been linked to higher blood pressure. To get your daily value of magnesium focus on eating foods like raw spinach, soybeans, avocados and even dark chocolate.

### Calcium

A lot of people think of calcium as for the bones, but it's also good for the heart. It helps weight management, which indirectly affects heart disease risk. It also helps regulate blood pressure along with magnesium and potassium. Shown is Calcium Carbonate crystals intermixed with a basal matrix.



### Chromium

is good for blood sugar control because it helps regulate insulin. Patients with diabetes have lower blood levels of chromium than healthy controls. There's also some evidence that chromium is helpful for treating diabetes. One study found that supplementation with a chromium-enriched yeast improved some measures of blood sugar.

This particular image features chromium being used by Amesite, which also forms versions of itself with magnesium and aluminum to achieve its defined crystal structure.