

# The Lake George Gem and Mineral Club -

## Club News

October, 2018



**Please Note: Meeting time changes to 10AM every October**

**Program for the month: Saturday October 13, 10:00AM. John Rakowski will talk about cleaning mineral specimens.** The focus will be on the common minerals from the Pikes Peak region with some do's and cautions of some problems to avoid. **Many members have asked about this subject, and, now that winter is coming, this is a timely topic. Bring your cleaning questions!**

**Silent Auction:** The silent auction returns this month! Bring some cash and be prepared to help support Club activities, including scholarships, Pebble Pups, and other items.

**FROM THE PRESIDENT** Ask not what the club can do for you- Ask what you can do for the club. We are an educational club that relies on volunteers to keep the club running. Without your support the programs that you enjoy will be reduced or curtailed.

**What we need:** President, Secretary, Editor Intern, Field Trip Coordinator (Dave Alexander will assist), Show Chair, Show Dealer Chair, and Silent Auction Chair.

**What you get:** 30 field trips with an opportunity to collect at productive claims that are not open to the general public, monthly informational presentations, additional educational opportunities like: Mineral Identification, Pebble Pups and Earth Science Scholars, and a new Fossil Study Program led by Paul Combs that will feature quarterly meetings, trips to museums, and, starting in October, field trips to collect and study fossils (see below)..

✓ ✓ **Another Club stalwart lost:** I'm sorry to report the death of one of our oldest members and supporters, **Roger Loest**, on September 30. Roger and his wife Dee were very active members when I joined in 2007, and only Roger's poor health slowed them down. Most recently, they gave the Club a large collection of geology books for the library. Roger will be missed by all who knew him. —ed.

✓ ✓ **Upcoming Programs:**

November-**Richard Kawamoto**, Mining Claims: A review of what a claim is and how to file for a claim.

December- Annual towel show and party, no presentation

## Coming Events

✓ ✓ Several mineral, fossil, and geology clubs meet relatively nearby and encourage visitors. These include:

>**Cañon City Geology Club**, meets on the 2<sup>nd</sup> Monday of the month at 6PM in the United Methodist Church, Cañon City;

>**Colorado Springs Mineralogical Society**, meets on the 3<sup>rd</sup> Thursday of each month at 7PM in the Mt. Carmel Veteran's Service Center, 530 Communication Circle, Colorado Springs;

>**Columbine Gem & Mineral Society**, meets on the 2<sup>nd</sup> Thursday of each month, 6:30PM in the meeting room, Mt. Shavano Manor, 525 W. 16<sup>th</sup> (at J St.), Salida;

>**Pueblo Rockhounds**, meets on the 3<sup>rd</sup> Thursday of each month at 6:30PM in the Westminster Presbyterian Church, 10 University Circle, Pueblo.

✓ ✓ **Pete Modreski** and others suggest the following upcoming events:

**Wed., Oct. 3**, 4:00 p.m., CU Geological Sciences Colloquium, "Rifts basins, volcanoes and hominin diversity in Pliocene Ethiopia", by Naomi Levin, University of Michigan. Benson Earth Sciences Building, Room 180; refreshments follow meeting; all welcome.

**Thurs., Oct. 4**, 7:00 p.m., Colorado School of Mines Geology Museum, "First Thursday" lecture series, **Huge explosive eruptions: Their nature and effects**, by Tom Casadevall, USGS Scientist Emeritus. CSM Geology Museum, 1310 Maple St., Golden, Room GRL 201 (the large conference room across the hall from the Museum). Socializing at 6:30 p.m., program at 7:00. All are welcome.

**Fri., Oct. 5**, 3:00 p.m., Denver Museum of Nature & Science, Earth Science Colloquium, **Colorado's Triassic Paradox: The salty evolution of the Moenkopi Fm.**, by Rob Fillmore, Western State Colorado University. VIP Room, museum admission not required. **NOTICE, THIS OCT. 5 TALK IS CANCELLED, DUE TO ILLNESS OF THE SPEAKER** (will be rescheduled later). See <http://www.dmns.org/science/research/earth-sciences/> for the schedule of DMNS Colloquia for the rest of the year:

**Fri., Oct. 12**, **Tectonics and Stratigraphy of the Denver Basin: Insights from Zircons and Apatites** by Glenn Sharman, University of Arkansas. 3rd floor Community Room, 3–4 p.m.

**Thurs., Nov. 15**, **Mammals Inherit the Earth: How the K/Pg Mass Extinction Killed off Dinosaurs and Opened the Way for Mammals**, by Greg Wilson, University of Washington. VIP Room, 3–4 p.m.

**Mon., Dec. 3**, **The Improbable Fossil Record of Jellyfish and Their Kin**, by Graham Young, Manitoba Museum. VIP Room, 3–4 p.m.

**Tues., Oct. 9**, 6-8 p.m., at "Golden Beer Talks", Windy Saddle Café, 1110 Washington Ave., Golden, **Applying Geological Exploration Methods Towards Locating Clandestine Graves Related to Homicide Investigations**, by Jim Reed, Director of R&D at RockWare, Inc, a geological software development and consulting company with offices in Golden, Colorado and Lugano, Switzerland. See <http://goldenbeertalks.org/>; "Golden's grassroots version of TED talks, expand your mind with a beer in your hand".

**Sat., Oct. 13**, 9 a.m. – 3 p.m., **Dinosaur Discovery Day** at Dinosaur Ridge, featuring "Girl Scout Day". Public tour day at Dinosaur Ridge, 16831 W. Alameda Parkway, Morrison. Walk up and down the Ridge to see interpretive guides explain the various fossil and geology stations, or ride a guided shuttle up and/or back for \$4. There will be special activities and earth science badges to complete for Girl Scouts, who may register in advance [\$6 for Scouts to register]. See [www.dinoridge.org](http://www.dinoridge.org) for more info.

**Sat., Oct. 13**, 10 a.m. – 4 p.m., "Dan's Used Rocks, 20<sup>th</sup> Anniversary Open House & Mineral Sale". 12296 W. Mississippi Ave., Lakewood CO; email [dansrocks@comcast.net](mailto:dansrocks@comcast.net). All are welcome. "Celebrating 20 years in business with

hundreds of specimens at 50% or more off, dozens of inexpensive flat lots, some one-time only deals, and of course plenty of food and drink."

**Tues., Oct. 16, and Wed., Oct. 17**, two short after-work **Geology Hikes** for the public will be held for the occasion of Earth Science Week, which runs Oct. 14-20. Meet at 5 p.m.; on Oct. 16, at the "Sleeping Elk Trailhead" at 18<sup>th</sup> St. & Belvedere St., Golden, for a hike up to the top of "Castle Rock" on South Table Mountain. Meet at 5 p.m. on Oct. 17 at the Rooney Road Trailhead on S. Rooney Road (Lakewood/Morrison/Golden), south of W. Colfax and I-70 and north of Alameda Parkway, for a short hike along the Green Mountain Trail. Back by dusk. For more information or if weather is questionable, contact USGS geologist Pete Modreski, [pmodreski@usgs.gov](mailto:pmodreski@usgs.gov), office 303-202-4766, cell 720-205-2553.

**Thurs., Oct. 18**, 7:00 p.m., **Colorado Scientific Society** October meeting, "**Structural Geology of Colorado**" by Ned Sterne, plus "**Electric log cross sections of Colorado**" by Steve Cumella. Shepherd of the Hills Church, 11500 W. 20<sup>th</sup> Ave., Lakewood; all are welcome.

**Sat., Oct. 20**, 12 noon, **Littleton Gem & Mineral Club, silent and verbal auction**. Columbine Hills Church, 9700 Old Coal Mine Avenue, Littleton, CO. Seller setups (club retains 20% commission) at 11, silent auction begins at noon, verbal auction at 1 p.m., checkout starts at 3:30 p.m. All are welcome.

**Fri., Nov. 9, Colorado Science Conference for Professional Development**. Held at the Denver Mart, 451 E. 58th Ave., Denver; for all science educators. For full information and registration website see <http://coloradoscienceconference.org/>.

**Nov. 10-11, 39<sup>th</sup> annual New Mexico Mineral Symposium**, at New Mexico Institute of Mining & Technology, Socorro, NM; see <https://geoinfo.nmt.edu/museum/minsymp/home.cfm>.

**Wed., Nov. 14**, 7:30 p.m., **Friends of Mineralogy, Colorado Chapter** bimonthly meeting; "**Still Crazy (about Franklin) after all these years: The minerals of Franklin and Sterling Hill, New Jersey**", by Carl (Bob) Carnein. Lakeview Event Center, 7864 W. Jewell Ave., Lakewood CO; all welcome.

**Thurs. Nov. 15**, 7:00 p.m., Colorado Scientific Society November meeting, "**Geothermal Energy**", by Jeff Winick, DOE, plus a possible 2<sup>nd</sup> speaker. Shepherd of the Hills Church, 11500 W. 20<sup>th</sup> Ave., Lakewood.

**Nov. 16-18, Denver Area Mineral Dealers Show**, Jefferson County Fairgrounds, Golden CO. Free admission, public welcome.

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Worth noting: the Program, Abstracts, and Field Trip Guides, for the recent Aug. 4-5, 2018 symposium, "**Minerals from the Metallic Ore Deposits of the American Southwest**" are available for free download at the Friends of Mineralogy, Colorado Chapter, website, at <http://friendsofmineralogycolorado.org/mmodas/>. Video recordings of the oral presentations will also be available soon at the CSM Library website. Likewise, both the abstracts and field guides and video recordings of most presentations from last year's symposium, "**Gold and Silver Deposits in Colorado**" (July 20-24, 2017) are available for free viewing and download online via the Colorado School of Mines Library website, at <https://dspace.library.colostate.edu/handle/11124/172170>.  
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**For more lecture series during the year see:** (most of the universities and societies do not hold seminars during the summer, but some groups (Denver Mining Club, Florissant Scientific Society) continue to meet.

**Colorado Beer Talks** (2<sup>nd</sup> Tuesday, 6-8 p.m.), Windy Saddle Café, 1110 Washington Avenue, Golden, "Golden's grassroots version of TED talks, Expand your mind with a beer in your hand", <http://goldenbeertalks.org/>

**Colorado Café Scientifique in Denver**, monthly lectures on science topics held either at Blake Street Station or Brooklyn's, Denver; open to the public, no charge other than refreshments you may choose to purchase; see <http://cafescicolorado.org/>.

**Colorado Scientific Society** (3<sup>rd</sup> Thursday, 7 p.m.), see <http://coloscisoc.org/>. Meets at Shepherd of the Hills Church, 11500 W. 20<sup>th</sup> Ave., Lakewood CO, except when noted.

**CU Geological Science Colloquium** (Wednesdays, 4 p.m.) see <http://www.colorado.edu/geologicalsciences/colloquium>

**CSU Dept. of Geoscience Seminars** (Fridays, 4 p.m.), see <https://warnercnr.colostate.edu/geosciences/geosciences-seminar-series/>

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**Van Tuyl Lecture Series, Colorado School of Mines**, (Thursdays, 4 p.m.): <https://geology.mines.edu/events-calendar/lectures/>

**Denver Mining Club** (Mondays, 11:30), see <http://www.denverminingclub.org/> .

**Denver Museum of Nature and Science, Earth Science Colloquium series**, 3:00-4:00 p.m., VIP Room unless noted, day of the week varies. Museum admission is not required; see <http://www.dmns.org/science/research/earth-sciences/>

**Denver Region Exploration Geologists Society** (DREGS; 1<sup>st</sup> Monday, 7 p.m.), <http://www.dregs.org/index.html>

**Florissant Scientific Society** (FSS); meets monthly in various Front Range locations for a lecture or field trip; meeting locations vary, normally on Sundays at noon; all interested persons are welcome to attend the meetings and trips; see <http://www.fss-co.org/> for details and schedules.

**Nerd Night Denver** is a theater-style evening featuring usually 3 short (20-minute) TED-style talks on science or related topics; held more-or-less monthly at the Oriental Theater, 4335 W. 44<sup>th</sup> Ave., Denver; drinks are available; for ages 18+. Admission is \$6 online in advance, \$10 at the door. See <https://www.nerdnitedenver.com/> .

**Rocky Mountain Map Society** (RMMS; Denver Public Library, Gates Room, 3<sup>rd</sup> Tuesday, 5:30 p.m.), <http://rmmmaps.org/>

**Western Interior Paleontology Society** (WIPS; Denver Museum of Nature & Science, 2<sup>nd</sup> Monday, 7 p.m.), <http://westernpaleo.org/> . Meetings are held either in the Ricketson Auditorium or the Planetarium at the Denver Museum of Nature & Science, unless otherwise noted

✓ ✓ Here's a list of remaining field trips for 2018 from **Billy Bell**:

**Oct. 17**: Belvedere quarry, fossils; Paul C., Bob C.

**Oct. 20**: North Table Mt., zeolites; **CANCELED**

**We are also working on a trip to the Colorado School of Mines Geology Museum.**

✓ ✓ **Paul Combs** sent this short article about the October 17 field trip:

### **FOSSIL-COLLECTING TRIP INTO THE ORDOVICIAN SYSTEM**

By Paul Combs

October 17 will kick off the start of our club's *Paleontology Study Group* (SEE ARTICLE BELOW) by giving all club members a chance to "get our hands dirty" in fossil collecting. We will start with a fossil-collecting trip to the famous Belvedere Quarry, a few miles north of Woodland Park off of highway 67. If you enjoy it, you might want to consider joining the club's *Paleontology Study Group*, which will specialize in fossils while continuing to do all the fun stuff the club already does.

The fossils we will collect on **OCT 17** are middle Ordovician age (about 470 million years old) and are found in the Manitou Formation, which is a reddish marine limestone / dolostone. Mostly, we will be finding early marine invertebrate animals (no backbones). This was an exciting time for scientists who study the evolution of life on our planet. Some animals, including trilobites, brachiopods and sea pens, were already around and they are common in the Manitou Formation. Many more life forms made their first appearance during the Ordovician Period. Not all the animals on the list below are found in the Manitou for the same reason that not all sea life is found together today. The Manitou environment was perfect for some forms, only okay for others, and unsuitable for several more.

I have done some collecting in the Manitou Formation and I'll bring some typical fossils to the October club meeting so you can get a better idea what to look for.

Perhaps the most interesting Ordovician event was the colonization of the land by life forms. Remains of early terrestrial arthropods (resembling modern millipedes) are known from this time, along with simple land plants. The origin of the Manitou Formation is marine, so we will be searching for salt-water critters. Let's take a closer look at them.

The environment was tropical and Colorado was located south of the equator at that time. In our area, the ocean was fairly shallow, with strong storms and high waves from time to time. One good indicator of the rough environment is the abundance of broken shells, or shells and body parts that have been separated (disarticulated). The ones in **bold underline** are found at the Belvedere Quarry, and a cross (+) means it is now extinct:

**Here are animals that were already living when the Ordovician Period began:**

**Sea pens:** These are “soft corals” that stand upright on the ocean floor and resemble small ostrich plumes. In the Manitou Formation, only the circular base is preserved.

**Graptolites (+):** Extremely delicate colonial animals. Not found in the Manitou Formation.

**Crinoids:** Distant relatives of starfish, they usually consisted of a segmented stalk with a calyx, or cup, at the top and feathery arms that snagged small food items out of the water. Not common in the Manitou Formation, their body parts are usually found separated.

**Brachiopods:** They superficially resemble clams, but are not related. There are at least three species in the Manitou Formation.

**Colonial corals:** These were not the reef-building corals we have today, but small colonies.

**Conulariids (+):** Relatives of jellyfish and sea anemones, but with a thin, 4-sided, pyramidal shell.

**Sponges:** Simple animals that are usually hollow or cup-shaped.

**Stromatolites:** The first colonial organisms. These were colonies of blue-green algae and they could reach 3 feet across.

**Trilobites (+):** Arthropods and distant relatives of crabs, lobsters and horseshoe crabs. This is why collectors come to the Manitou Formation. They ranged in size from less than an inch long to over a foot (rare). The Manitou Formation has over a half-dozen species, including some unusually large ones. Their body parts are often separated.

**These animals made their first appearance during the Ordovician Period:**

**Solitary corals (+):** These corals are often horn-shaped. They are tough and usually well-preserved, but they are not common

**Cystoids (+):** A very small starfish relative, they were similar to crinoids, but with very short, tapering stalks and no feathery arms.

**Blastoids (+):** Similar to cystoids.

**Bryozoans:** Tiny colonial animals. Some formed crusts on hard surfaces, others formed fine net-like structures.

**Ostracods:** Their shells look like tiny clams, but they are actually relatives of crabs and shrimp

**Starfish (Asteroidea):** You know these guys. Their soft bodies made them difficult to preserve as fossils.

**Snails (gastropods):** Began before the Ordovician and really took off. Look for simple, coiled ones up to an inch across.

**Scaphopods:** Often called tusk shells, they should be in the Manitou, but have not been found--yet

**Clams (Bivalves):** No need to describe them. Look for small ones.

**Sea urchins (Echinoids):** Ball-shaped relatives of starfish, they are covered in spines. Their body parts are almost always disarticulated (separated)

**Nautiloid cephalopods (+):** These are relatives of today’s nautilus and they really took off at this time, but they had not begun to coil yet. The ones in the Manitou have straight cones (orthocone cephalopods)

**Ichnofossils:** Many of these animals were attached to the ocean floor (sessile) while others moved around (mobile). A few were active swimmers. The mobile ones often created trails, tunnels and burrows and these are well preserved in the Manitou Formation. Some layers are covered with burrows. These “trace fossils” are not body fossils, but they tell us a lot. Some are nearly identical to the markings made by modern animals that have inhabited the oceans continuously since they first appeared. Some tunnels and burrows have been found with the fossilized animal still inside! I will bring some Manitou trace fossils (ichnofossils) to the October club meeting.

**NOTE:** Very primitive, jawless, armored fish (Pteraspidomorphi) appear in the fossil record shortly before this time, so we’ll keep an eye out for them. They have not been found in the Manitou, yet, but their scattered hard parts are common in the Harding Formation near Canon City, which is slightly older than the Manitou.

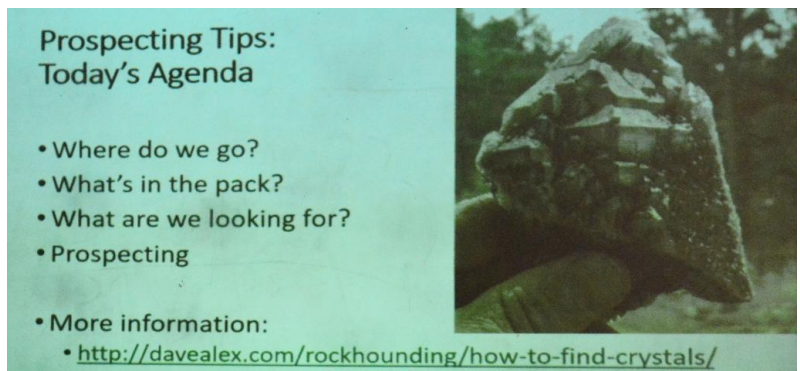
**ANOTHER NOTE:** Fossil collecting is different from the “boulder bashing” that we do when we collect local mineral specimens. You will discover that many of the best fossils are already exposed. To open the rocks,

your best tool is a **small hammer** (not a sledge) and a **wide chisel**. Place the chisel along the bedding plane (between layers) of the rock and tap it lightly. When you open the bedding plane this way, you are exposing the fossils in the same position they were buried and you are most likely to collect whole fossils. Randomly bashing these rocks will often destroy the fossils you are looking for. Also, bring a **soft, plastic brush** to remove dirt and dust so you can get a better look. And don't forget to bring a **hand lens**. Last, and very important, tossing these fossils into a bag, bucket or box will quickly damage them. No fossil collector does that. Bring **old t-shirts or newspaper** to wrap and protect them.

Bring your discoveries to the November club meeting and we'll identify them!

✓ ✓ **Frank Rosenberg** sent this report about the September meeting:

At September's club meeting, we were fortunate to have our club member **Dave Alexander** impart some valuable tips on prospecting in our local area. Dave clearly explained a wide range of important subjects including: where to go and what to look for; how to create a prospecting map; what to carry in your pack; and what granite pegmatites are and what they look like.



✓ ✓ **Wayne Orlowski** sent the following interesting links:

\*\*Geologists already feel the deep-time connection. I would state that our modern society is dumbed-out on time, especially in the USA, and this will cause the world big problems now and in the future. See:

<http://nautil.us/issue/64/the-unseen/geology-makes-you-time> literate

\*\*I love the plumb-bob evidence for a flat Earth: <https://youtu.be/trrgPOJCPe8> and how tall structures should be wider at the top if the Earth is round! And better yet, using Einstein's theory of gravity and light is also phenomenal to prove the Earth only looks round from space but is actually flat. There should be a Go Fund Me campaign to send all Flat Earthers to the Antarctic for a last long walk.

▶ ▶ And here is the latest installment of "**Bench Tips**" by **Brad Smith** ([www.BradSmithJewelry.com](http://www.BradSmithJewelry.com)):

## SPOT-SANDING BRUSH

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/>



## SILVER SOLDER FROM SCRAP

Sometimes you need a lot of silver solder to complete a piece the way you want it to be. For me, it was when I was trying to join several castings. But silver solder is expensive, so I found a way to make my own from scrap with a little help from a penny.

First step is finding out what's in a solder. A search through the reference books (Tim McCreight or Erhard Brepohl) or a Google search will turn up recipes like:

- \* Hard - Ag 80% Cu 13% Zn 7%
- \* Medium - Ag 70% Cu 20% Zn 5%
- \* Easy - Ag 63% Cu 30% Zn 7%

The silver (Ag) and the copper (Cu) are easy to come by, but finding some zinc (Zn) has always been my problem, until I found out that our pennies are almost all zinc. According to Wikipedia, a US penny minted after 1982 weighs 2.5 grams and is 97.5% Zn and 2.5% Cu. So all I had to do is add a penny to some copper and a pile of silver scrap.

I chose to use Sterling scrap so I adjusted for the amount of copper in it as well as the amount of copper from the penny. Here's what I used for components of Medium solder:

- \* Sterling - 36.90 grams
- \* Copper - 9.35
- \* Penny - 2.50

Melt the silver and copper first in a melting dish. Mix well with a carbon rod or titanium solder pick, add the zinc (penny) last, mix again, and pour into a small mold. The zinc is added last because melting it causes some to vaporize, and the fumes are a safety problem (they're a gray-green color). Be sure to have good ventilation.

To check the solder's melting temperature is correct (medium), I put a sample of the homemade solder on a piece of copper sheet along with a known sample of hard, medium and easy solders. I then heated the plate from the bottom and watched as the easy melted, the medium melted, the homemade melted, and finally the hard.

Additional notes on converting the ingot to sheet, strip, or wire form - If you have access to a rolling mill, that

will be the fastest way to proceed. Either roll out the ingot into a sheet and cut strips or roll it out as wire if your mill has the grooves. If you don't have a mill, all you have to do is forge out the ingot into a rough sheet of the gauge you'd like and then cut thin strips with bench shears. Be sure to anneal the sheet every so often as you forge it.

Pick Up a Few New Jewelry Skills With Brad's "How To Do It" Books

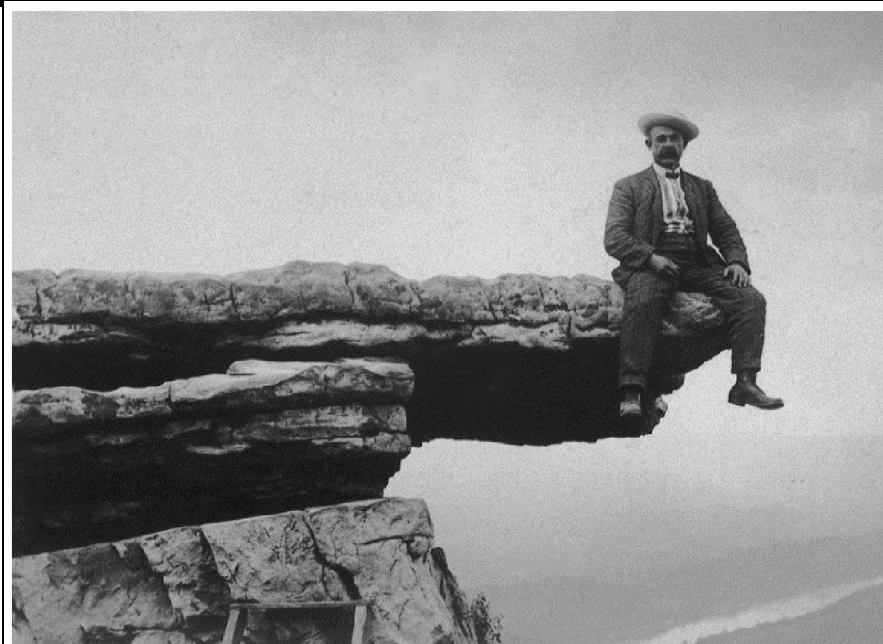
<http://amazon.com/author/bradfordsmith>

## Notes from the Editor

Bob Carnein, Editor

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**Paul Combs** wants to make sure you know about the fossil group! Thanks, Paul, for the articles:

### **FOSSIL GROUP TAKES OFF!**

By Paul Combs

The September club meeting only had about 40 members in attendance, but was kind of historic: it saw the creation of the LGGMC's first focus group: **The Paleontology Study Group**. In other words, a collection of club members who have a special interest in collecting, and learning about, fossils. This is a topic the LGGMC has seldom discussed, despite the fact that there are many fossil-bearing formations around the area, ranging from Cambrian age (Sawatch Formation – 530 million years old) to Eocene age (Florissant Formation – 34 million years old).

I will be the group leader until I am inevitably overthrown in a bloody coup. I originally studied marine invertebrate paleontology at the University of Missouri until I changed to Russian language and had a fun career in the intelligence business. But I kept my love for fossils and continued to take paleontology courses when I could during my assignments. Prior to arriving in Colorado in 2006, I was in graduate school at Texas A & M, Corpus Christi, and I also volunteered in the Paleontology Department at Texas A & M, Kingsville. I collected, identified, preserved and catalogued Pliocene and Pleistocene fossils (mammoth, giant tortoise, camel, wolf, horse, saber-tooth, alligator, etc.).

If you have read this far, you are probably interested in the details:

- The Paleontology Study Group (PSG) is a voluntary organization within the LGGMC and no dues or fees are charged for membership.
- Minimum PSG membership is 10 individuals. Eleven people signed up during the September LGGMC meeting, and, when you consider that only a few club members were present that day, this is actually a good

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start! There will be sign-up opportunities in the back of the Community Center at every monthly club meeting. If the PSG's membership falls below 10 individuals and remains there for a few months, the group will stop its activities and everyone will get his/her money back.

- You don't even need to attend a LGGMC meeting to join! You can sign up for the Paleontology Study Group at any time by email. Just contact me directly at: [combsbp@gmail.com](mailto:combsbp@gmail.com) and say you'd like to join. To quote a local TV commercial, "It's just that easy." When you join, I will send you an email with an attachment containing more information.

- That attachment also contains a list of 15 indoor (winter) classes and activities and 8 outdoor (summer) activities, so the group already has enough ideas to last for a few years. And those lists are far from complete.

- The PSG will officially meet quarterly, in March, June, September and December in the Lake George Community Center, directly after regular LGGMC club meetings. That is the minimum. The intent is to do more than that.

- I, or another member of the PSG, will write a monthly paleontology column for the LGGMC newsletter. This is the first one.

- Overnight and out-of-state trips are possible and encouraged! There are outstanding museums and collecting sites in every state that borders Colorado. I go on collecting trips to the Brownwood, Texas, area every couple of years, for instance.

- **NOTE:** It is illegal to collect vertebrate fossils on federal or state lands, so we will not be collecting dinosaurs or mammoths. I will be checking out opportunities to volunteer at ongoing vertebrate digs, so stay tuned. We will be talking about vertebrate and invertebrate fossils, but our collecting will be restricted to invertebrates. The good news is, there is a huge variety in the area.

The list below includes seven of the local fossil-bearing formations and some of the fossils they contain. Youngest formations are listed at the top, the same way you would find them in nature.

*Florissant Formation (34 million years old - Eocene age): Exceptionally well-preserved leaves and insects, along with fish, snails, world's largest "petrified" trees*

*Pierre Formation (72-83 million years old - Cretaceous): Advanced marine invertebrates, occasional vertebrate fossils, baculites, shark teeth, including mosasaurs*

*Niobrara Formation (87 million years old – late Cretaceous age): Advanced marine invertebrates, including nearly modern forms. I have found mosasaur bones in it. Also, rarely, dinosaurs, fish, sea turtles, pterosaurs, plesiosaurs*

*Fountain Formation (290-340 million years old -late Pennsylvanian age): trace fossils, brachiopods, bryozoans, snails, crinoids, at least 10 different early trees and horsetails*

*Leadville Formation (350 million years old – Mississippian age): Marine invertebrates, including solitary corals, stromatolites, brachiopods, cephalopods*

*Harding Formation (460 million years old - middle Ordovician age): Primitive marine invertebrates, shark scales, plus millions of fragments of two of the earliest fossil fish*

*Manitou Formation (470 million years old - Ordovician age): Early marine invertebrates, including more advanced types not present in the Sawatch Formation*

*Sawatch Formation (530 million years old - Cambrian age): Very early marine invertebrates*

HERE IS A WEB SITE THAT WILL SHOW YOU COLORADO'S LONG LIST OF FOSSIL-BEARING ROCK FORMATIONS:

[https://en.wikipedia.org/wiki/List\\_of\\_fossiliferous\\_stratigraphic\\_units\\_in\\_Colorado](https://en.wikipedia.org/wiki/List_of_fossiliferous_stratigraphic_units_in_Colorado)

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## Monthly Mineral Quiz

Answer to last month's quiz: Sodalite



The name *sodalite* comes from the fact that this relatively rare mineral occurs in igneous rocks that crystallize from sodium-rich magmas (its composition is  $\text{Na}_4\text{Al}_3\text{Si}_3\text{O}_{12}\text{Cl}$ ). It's one of a group of minerals called *feldspathoids*. These are all silica-deficient, which means they form instead of feldspars in magmas that don't have enough silica to use up all of their Ca, K, or Na to make feldspars. Sodalite was first found in Greenland, but other deposits occur in Russia, Namibia, British Columbia, Ontario, Maine, and Arkansas. Although it's usually translucent or opaque, sodalite is often used to make beads or cabochons.

This month's mineral



Carnein collection and photos.

Here's a very common mineral that often gives beginners a problem. The photo shows crystals of this brown mineral with quartz from a locality in Connecticut. The crystals are typically rhombohedrons (shaped like squashed cubes, with diamond-shaped faces). Its hardness is about 3.5 (like a copper penny), and its specific gravity is nearly 4 (it varies because its composition is variable). In places, it is an important ore mineral. Pseudomorphs of goethite or hematite after this mineral occur in the area north of Lake George. What is it?

Lake George Gem and Mineral Club

October, 2018

Lake George Gem & Mineral Club  
PO Bo 171  
Lake George, CO 80827



**The Lake George Gem and Mineral Club** is a group of people interested in rocks and minerals, fossils, geography and history of the Pikes Peak/South Park area, Indian artifacts, and the great outdoors. The Club's informational programs and field trips provide opportunities to learn about Earth science, rocks and minerals, lapidary work and jewelry making, and to share information and experiences with other members. Guests are welcome to attend, to see what we are about!

The Club is geared primarily to amateur collectors and artisans, with programs of interest both to beginners and serious amateurs. The Club meets on the second Saturday of each month at the Lake George Community Center, located on the north side of US Highway 24 on the east edge of town, sharing a building with the county highway shops. **In the winter, we meet at 10:00AM. From April through October, we meet at 9:00AM, to allow more time for our field trips.**

Our organization is incorporated under Colorado law as a nonprofit educational organization, and is a member of the Colorado, Rocky Mountain, and American Federations of Mineralogical Societies. We also sponsor an annual Gem and Mineral Show at Lake George, where collectors and others may purchase or sell rocks, minerals, fossils, gems, or jewelry. Annual membership dues (Jan. 1 through Dec. 31) are \$15.00 for an individual (18 and over), and \$25.00 for a family (parents plus dependents under age 18).

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