

DAISY MOUNTAIN ROCKCHIPS

The purpose of Daisy Mountain Rock & Mineral Club is to promote and further an interest in geology, mineralogy, and lapidary arts, through education, field experiences, public service, and friendship.

VOLUME 5, ISSUE 2

FEBRUARY 2020



**EVEN NATURE
CELEBRATES**

Valentine's

Day



FOSSILS: PART IV

Kingdom: Animalia

Phylum: Porifera

By Susan Celestian

The third major Kingdom is Animalia, which of course includes you and me (humans). This is a group of multicellular eukaryotes (reminder: organisms with nucleated cells that are complexly organized). Characteristics that most animals share are:

- ▶ Unlike kingdoms discussed previously, animals do not produce their own food. Instead, they consume some form of organic material.
- ▶ Most breathe oxygen.
- ▶ They are mobile, during at least part of their life cycles.
- ▶ Their embryonic development is marked by a blastula (hollow ball of cells), that develops into specialized body parts.

You know humans -- always trying to refine their observations; always "splitting hairs". SO.... Kingdoms can be further divided up into a number of subdivisions -- Phylum, Sub-phylum, Class, Sub-class, Order..... There are now 36 phyla in the Kingdom Animalia. The vast majority of extant species are within 9 of them, and most fossils in a different group of 8. As a result, for purposes of this newsletter, I will begin with PORIFERA, and future topics within the Kingdom Animalia, will be organized as below:

KINGDOM - Animalia

PHYLUM - Porifera

PHYLUM - Cnidaria

PHYLUM - Bryozoa

PHYLUM - Mollusca

CLASS - Gastropoda

CLASS - Bivalvia

CLASS - Cephalopoda

CLASS - Scaphopoda

PHYLUM - Brachiopoda

PHYLUM - Arthropoda

CLASS - Trilobita

CLASS - Crustacea

CLASS - Chelicerata

CLASS - Insecta

PHYLUM - Echinodermata

CLASS - Asteroidea

CLASS - Ophiuroidea

CLASS - Echinoidea

CLASS - Crinoidea

PHYLUM - Chordata

Miscellaneous Phyla

Porifera continued on page 9....



HEMATITE

By Susan Celestian

Theophrastus originally named hematite around 300-325 BC. The name derives from the Greek for *blood stone*, due to the sometimes red color (and the red streak). It may be the first mineral given a name ending in 'ite'.

Chemical Formula - Fe₂O₃ (Iron Oxide)

Crystal System - Trigonal (4 axes -- 3 of equal length and oriented 120° from each other in a single plane; a 4th axis perpendicular to the other 3. Also known as the rhombohedral system, as has 3-fold symmetry. http://webmineral.com/crystal/Trigonal-HexagonalScalenohehdral.shtml#_XkiglGhKg2w

Growth Forms/Habits - Massive, stout to tabular crystals, micaceous, fibrous, reniform, granular, oölitic (roses, specular, kidney ore...)

Hardness - 5-6

Color - Steel-gray to black, rusty-red

Luster - Metallic, sub-metallic, earthy, dull

Streak - Reddish brown to bright red

Specific Gravity - 5.26

Cleavage - None

Fracture - Sub-Conchoidal to uneven

Other - Is not overly magnetic, but may be weakly magnetic, more likely due to the presence of some associated magnetite.

Hematite is an important iron ore mineral. It is also used as a pigment, and has been used thusly for at least the last 164,000 years (according to Wikipedia).

Hematite continued on page 16....

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February 4, 2020

Board of Trustees Meeting Minutes

- In attendance: Bob E., Clark L., Claudia M., Cynthia B., Deanne G., Don R., Ed W., Howard R., Jessica C., Jonathan M., Rebecca S., Stan C., Tiffany P. and William F. Tammy E. made a guest appearance
- January minutes approved
- Cynthia B. discussed our finances
 - Dave H. will not be able to do the audit this year
 - ◊ Deanne G. volunteered to do the 2019 fiscal year, and will be complete in the next couple of months
- Claudia M. talked about S.T.E.A.M. nights
 - March 5th, 5-7pm
 - ◊ Tables with presentations to show
 - March 25th at Canyon Springs
 - Bill S. and Claudia M. also did a career night
 - Thank you to all the volunteers for helping!
- Show preparations were discussed
 - Next meeting will be in March
 - Volunteers will have an online system to sign up on
 - ◊ Will be implemented soon
 - * System can also work with other sign ups within the club
 - * Tiffany P. will investigate this
 - Fluorescents for club display are needed
 - Membership table will need another helper
 - Lori P. would like to have the rocks judged with ribbons for the club display case
 - Clark L. discussed the food truck
 - ◊ Burgers Amoré would cost too much
 - ◊ Will try hot dog truck again
 - ◊ Will research other vendors
 - Howard R. spoke about the layout
 - ◊ All vendors need access to power even if not necessary
 - ◊ Will take an inventory of the cords
 - * May need to buy/rent more
 - ◊ Need 3 plug adapters
 - Jessica C. is heading the marketing
 - ◊ They will have another subcommittee meeting soon

Board Minutes continued on page 4....

February 4, 2020

General Club Meeting Minutes

- Thank you to Stan C., previous vice-president, for his insightful presentation on volcanoes
- Raffle was led by Robin S. and Deanne G.
- Cynthia B. discussed the financial report
 - \$214 raised from the raffle this month
 - Vendor money is coming in
 - Show location has been paid
- Show & Tell
 - Thank you to Stan C. for creating a beautiful plaque!
 - Stan C.
 - ◊ Volcanic bombs and Rainbow Obsidian
 - Ed W.
 - ◊ Amethyst lace with citrine, from Contact Mine
 - Bill F.
 - ◊ Chert from Sheep's Bridge
- Stan C. discussed the claim's committee
 - Claim paperwork will be researched further
 - Wickenburg is another possible location
- Upcoming field trips
 - Don't forget to fill out field trip surveys when you attend
 - They will all be listed on the newsletters, can be accessed through our website (dmrmc.com), and through GroupWorks
- Laurie M. discussed the show display cases
 - She will be adding a voting aspect this year
 - ◊ Bring in your best rock-hounded item into the next meeting to see if it wins
 - ◊ Customers will vote on Saturday
 - ◊ 1st, 2nd and 3rd place ribbons will be displayed on Sunday
 - The 2 cabinets are to be a celebration of who we are and what we collect
- Claudia M. recapped the S.T.E.A.M. nights
 - Went to New River, Anthem Elementary, and Black Mountain Elementary
 - March 5th, Chares Academy in Anthem
- **Special thanks to Jennifer G. for being such an amazing teacher for the wire wrapping class**
- **Special thanks to Tiffany P. for membership and everything else you go above and beyond to do for this club**

Respectfully submitted by Rebecca Slosarik

....Board Minutes continued from page 3

- Bob E. will be buying geodes for the club to sell
 - ◊ Can be cracked at the table
- Stan C. reported on the claims committee progress
 - Contact mine claim near Aguila is a possibility
 - ◊ Old claim has lapsed
 - * Would just need to file with Maricopa County
 - ◊ Has amethyst lace, copper, silver and chrysocolla
- Other locations are still being researched and reviewed
- Our by laws are now accessible on the club website: dmmc.com
 - This club is based on modern science
 - ◊ While representing the club, all members should adhere to our practices and policies

Respectfully submitted by Rebecca Slosarik

Upcoming Meeting Programs

Thanks to Ed Winbourne for scheduling the following speakers:

- March - Patti Polk (Agate)
- April - Wayne Helfand AT the Rare Earth Gallery in Cave Creek

Words of Wisdom

from our very own

Bob Evans



Seventy might be the new 50, but 9:30 is the new midnight.

**REMEMBER:
DMRMC GEM &
MINERAL SHOW**

Mar 21-22, 2020

Sat 9-5; Sun 10-4

Anthem School

This is our club's show, and it is important that we all participate as much as we can. **Please consider VOLUNTEERING!**



- ▶ Donate items for door prizes
- ▶ Donate items or the silent auction
- ▶ Help set up on Friday, and take down on Sunday
- ▶ Lend some time to the Kid's Table, Club Sales Table, & Fluorescent Room
- ▶ Attend the show and support the vendors



February Speaker - Stan Celestian Volcanoes

Club member, Stan Celestian discussed the generation of magma, volcanic styles, and volcanic landforms.

Volcanoes result from the build up of volcanic material, at a vulnerable opening in the Earth's crust. Magma is the primary medium of a volcanic eruption.

Three factors influence the formation of magma:

- increase in temperature, at great depth, within the Earth;
- the addition of fluids, such as occurs where oceanic crustal rocks subduct (dive to depth), dragging along sea water; or
- the reduction of pressure, such as occurs where the crust fractures over rising plumes of hot crustal rocks

Magma is molten rock and volatiles, such as water, carbon dioxide, sulfur dioxide. The three basic types of magma are:

► Basaltic - This magma

- is high in iron and magnesium, and low in silica;
- it is very fluid,
- generally quiet non-explosive eruptions and extensive flows
- forms **shield volcanoes** (domed mountains with broad, gentle slopes);
- Include volcanic features, such as pahoehoe lava (ropy), a'a' lava (sharp/blocky), summit craters, cinder cones;
- occur at mantle plumes, mid-ocean rifts (examples: Hawaii, Iceland, Olympus Mons on Mars).

► Intermediate (andesitic) - This magma

- has a composition intermediate between basaltic and felsic;
- is quite viscous,
- generally explosive eruptions, with lots of pyroclastics (ash, nuée ardentes or hot pyroclastic flows)
- Includes volcanic features as in felsics
- forms composite volcanoes, or stratovolcanoes (tall cone-shaped mountains with steep slopes composed of layers of magma and pyroclastics (ash,

pumice, lapilli, cinders)

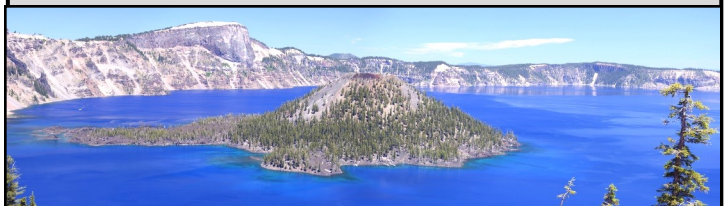
- occur at subduction zones (examples: same as felsic)

► Felsic (rhyolitic) - This magma is

- low in iron and magnesium, high in silica;
- is very viscous
- generally explosive eruptions, with lots of pyroclastics (ash, nuée ardentes or hot pyroclastic flows);
- Includes volcanic features, such as pyroclastic flows, lahars (muddy debris flows), volcanic plugs/domes (rocky spires forced to the surface by pressure), calderas (collapse craters);
- forms composite volcanoes, or stratovolcanoes (tall cone-shaped mountains with steep slopes composed of lapilli, cinders) and magma
- occur at subduction zones (examples: San Francisco Peaks, Cascades, Aleutians, Yellowstone, Martinique)

Other features and activities associated with volcanoes include:

- Earthquakes,
- Landslides.
- Tsunami (seismic sea waves).
- Geysers, hot mud pools.....
- Intrusive bodies:
 - Dikes (lava-filled cracks that being more resistant than surrounding rocks, may rise above the land surface as a rock "wall"). These can be seen throughout the West, with recognizable ones associated with Shiprock.
 - Sills (relatively small, usually domed rock bodies formed when magma is injected between rock layers, where it cools)
 - Necks (topographic spire formed when a rock-filled volcanic conduit (or pipe) is exposed by erosion). An example is Shiprock.
 - Batholiths (huge, deep body of rock formed when a magma chamber cools)



Caldera, Crater Lake, with cinder cone Wizard Island .
Photo by Stan Celestian

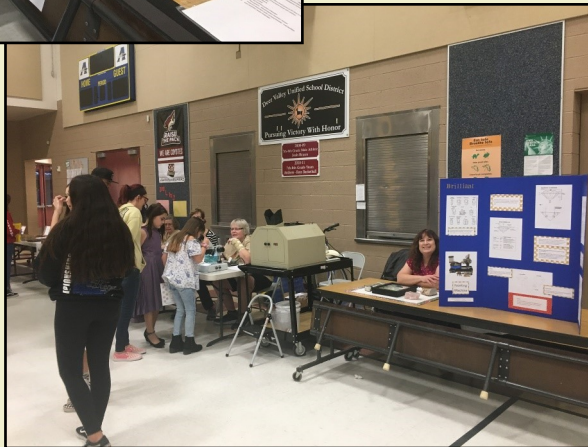
EDUCATION OUTREACH

Photos by Ed Winbourne

On Wednesday, January 29th, a stalwart and enthusiastic group of DMRMC members manned a table and imparted geologic wisdom during STEAM night at Anthem Elementary School. They provide hands-on experience with rocks, minerals, fluorescence, fossils, physical properties, and other topics of interest -- tying the fun of the hobby with the science of geology.



Thanks Claudia M.,
Ron O., Cynthia F.,
Shirley Cote., Bill S.,
Ed W., Doug D. and
Nancy L.!



And on Friday, January 31st,
most of these valiant
volunteers repeated the
performance for STEM night
at Black Mountain
Elementary School in Cave
Creek.



Thanks Claudia, Ron,
Cynthia B., Shirley, Bill S., Ed,
Doug and Nancy!

FIELD TRIP REPORT BURRO CREEK FEBRUARY 9, 2020

Photos by Jennifer Gecho

On Saturday, February 9th, Bill F. led a club trip to Burro Creek, where colorful and patterned cherts abound. By the looks of the dump at the Bagdad Mine, in the distance, it looks like it was a windy day! But there were lots of smiles on the many attendees!!



FIELD TRIP REPORT CONTACT MINE FEBRUARY 16, 2020

On Sunday, February 16th, Ed W. led the club to an amethyst site at the Contact Mine, a mine the club is looking in to establish a claim. Unfortunately, no one sent me or posted photos of he trip.

JUST FOR FUN



OPEN
SESAME



This is a unique concretion that Susan Celestian collected in an Illinois quarry, about 50 years ago! The “box” is iron oxide-cemented clay. Take off the “lid” and reveal a clay “bauble”.

Photo by Stan Celestian

...Porifera continued from page 2

PHYLUM - PORIFERA (“Pore Bearer”)

This phylum encompasses the sponges. There are 4 classes, based on skeletal composition; however, for purposes of this article, I will acknowledge that fact, and just speak generally about the group. Very simply, sponges are immobile, porous bags, composed of a jelly-like material. See Figure 1.

- There are cells specialized for various tasks, but there are they are not organized: there are no internal organs, no nervous system, no circulatory system, and no digestive system
- With sexual reproduction, larvae are produced that ride currents until they settle down to their lifetime residence.
- With asexual budding, new sponge individuals can grow.
- Geologic Range: Precambrian-Recent
- There are at least 5000 (maybe as many as 10,000) living species.
- By far most species are marine, inhabiting depths from tidal zones (exposed at low tide), down to 5.5 miles.

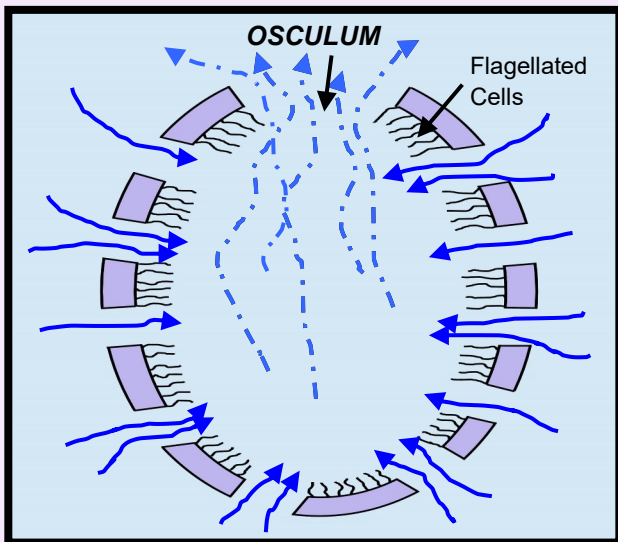


FIGURE 1 SPONGE BASIC BODY PLAN The simplest sponge body plan is a bag with porous walls. Flagellated cells line the canals and interior, and create currents that draw water in, past cells that retrieve and digest nutrients. Water is expelled out the top opening(s) or osculum (oscula). Other wall configurations can be quite convoluted, increasing surface area. *Graphic by Susan Celestian*

- They are solitary and colonial.
- Sponges are primarily filter feeders, i.e. they filter food out of water that passes by, rather than actively pursuing food or making food.
- Sponges often act as harbor or hosts of other organisms.
- Many sponges have spicules -- structures that are embedded in the tissue, thus supplying support and rigidity. Spicules can be made of spongin, calcium carbonate, or silica (See Figure 2-6). For more images, go to :https://en.wikipedia.org/wiki/Sponge_spicule#/media/File:Demospongiae_spicule_diversity.png and https://i2.wp.com/www.paleowire.com/wp-content/uploads/2018/07/sgff_a_1479444_f0004_b.jpeg?ssl=1



FIGURE 2 SPONGIN

These are common sponges you can purchase for cleaning. They are composed of the spongin

spicule material that remains after the “flesh” of a natural sponge has rotted away.

Image by Manfred Richter from Pixabay.

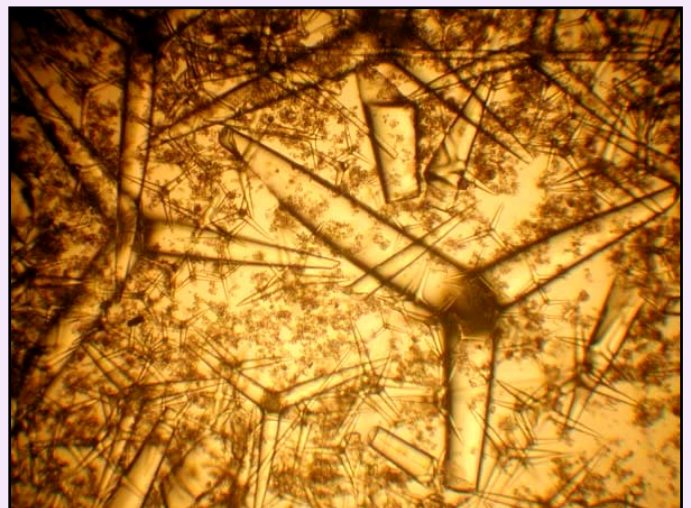


FIGURE 3 SPONGE SPICULES These are silica spicules from a living sponge. *Image from [Islands in the Sea 2002, NOAA/OER](#)*

...Porifera continued from page 9



FIGURE 4 SPONGE SPICULES IN SAND The triaxial silica spicules in the center of the image are in a sand from Grace Darling Beach Park, Western Australia. The field of view is less than 1/4 inch across, for scale. *Photo by Stan Celestian*



FIGURE 5 FOSSIL SPONGE SPICULES This is a view of a slab from the Pennsylvanian-age Naco Formation, Gila County, Arizona. It is full of twiggy sponge spicules that were released and accumulated after the flesh of dead sponges rotted away. *Photo by John Christian*

- Included with the sponges are **Archaeocyathids** and **Stromatoporoids**.
- * Archaeocyathids were largely restricted to the Lower to Middle Cambrian period (525-510 mya). Their worldwide distribution assumes a larval stage. They were important reef-builders,

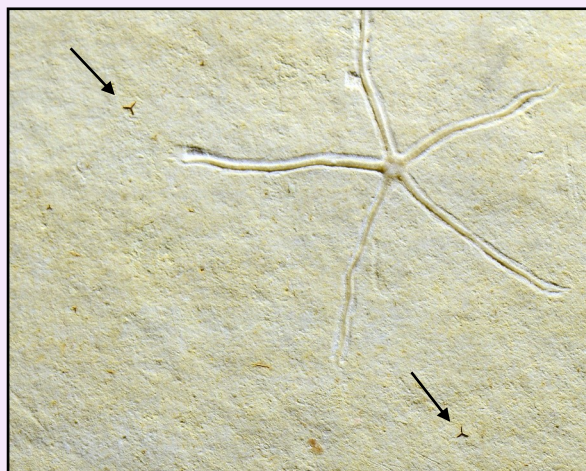


FIGURE 6 FOSSIL SPONGE SPICULES In this image, the arrows point to sponge spicules, fossilized along with a brittle star, in the Solnhofen Limestone, a Jurassic rock from Bavaria, Germany.

Photo by Stan Celestian

before the rise of more successful sponges and corals. Their general anatomy was cup or vase-shaped -- double porous walls with space between divided by radial partitions -- composed of calcium carbonate. See Figures 7-9.

- * Stromatoporoids were once classified as corals (and often physically confused with stromatolites), but about 100 years ago were re-described as a sponge, and since have been assigned their own class within the phylum. They built calcareous masses, constructed of thin layers separated by tiny pillars. Important reef-builders during the Mid-Ordovician through Devonian, structures were varied from domes (some exceeding 15' in diameter), cylinders, encrusting and mats. Their geologic range is also a bit difficult to pin down in the literature. Thought to go largely extinct at the beginning of the Carboniferous, they seem to have re-emerged during the Mesozoic, apparently going extinct at the end of the Cretaceous (although there are mentions of discoveries of modern forms in the deep ocean). See Figures 10-14.

...Porifera continued from page 10

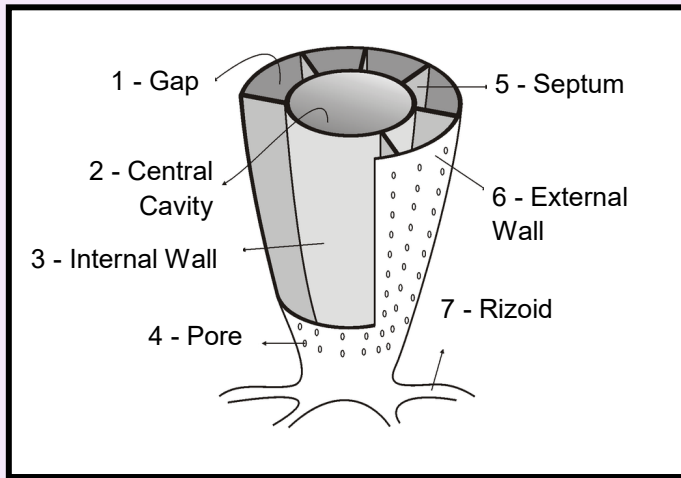


FIGURE 7 BASIC ARCHAEOCYATHID BODY PLAN This diagram depicts the basic anatomy of archaeocyathids -- basically a porous, double-walled cone-like or cupped structure, with rootlike holdfasts. The structure was typically 3/4" to 3" high, and about 1/8" to 1" in diameter. *Diagram by Muriel Gottrop (Nov 2005) and permitted through Wikipedia [Creative Commons Attribution-Share Alike 2.5 Generic](#). (The only changes I made was to add the labelling.)*



FIGURE 8 CAMBRIAN ARCHAEOCYATHIDS Archaeocyathids exhibited some interesting and varied morphologies. *Diagram ©Stanton F. Fink and permitted through Wikipedia [Creative Commons Attribution-Share Alike 2.5 Generic](#).*

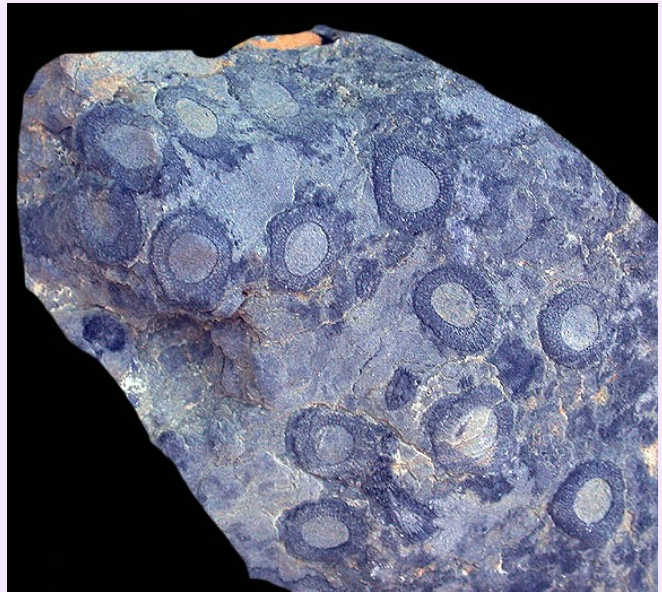


FIGURE 9 ARCHAEOCYATHID FOSSILS These are two photos of archaeocyathids fossils in the Lower Cambrian Poleta Formation, at Westgard Pass, California. Note the inner and outer walls, with the septa (radiating walls) in between. *Photos used by permission of Inyo <http://inyo2.coffeecup.com/westgardpass/westgardpass.html>*

...Porifera continued from page 11



FIGURE 10 STROMATOPOROID This specimen from Kentucky, displays the typical bumps (mamelon) on the surface. Not obvious, but still visible are radiating striations (astrorhizae) around each bump. These both served functions associated with the internal canal system and fluid distribution.

Photo by Stan Celestian



FIGURE 11 PILLARS AND LAMINAE This is a photo of a cut/polished cross-section of a Devonian stromatoporoid, out of the Martin Formation in Sycamore Canyon, Yavapai County, Arizona. The field of view is about 1" by 1/2". Note the very thin laminae and vertical pillars, typical of stromatoporoids.

Photo by Stan Celestian



(mamelon).

Photo by Stan Celestian

FIGURE 12 ENCRUSTING STROMATOPOROID

This a horn coral, from the Devonian Martin Formation of central Arizona. Upon it is encrusted the stromatoporoid, *Amphipora* sp., characterized by the visible bumps



FIGURE 13 DEVONIAN STROMATOPOROID This specimen, from the Devonian Martin Formation of Central Arizona, demonstrates how stromatoporoids might be confused with stromatolites. Layers of organic material, interlayered with sediment, and a lack of visible structure (due to recrystallization when the fossil was replaced by silica), share many similarities between the two quite disparate groups.

Photo by Stan Celestian

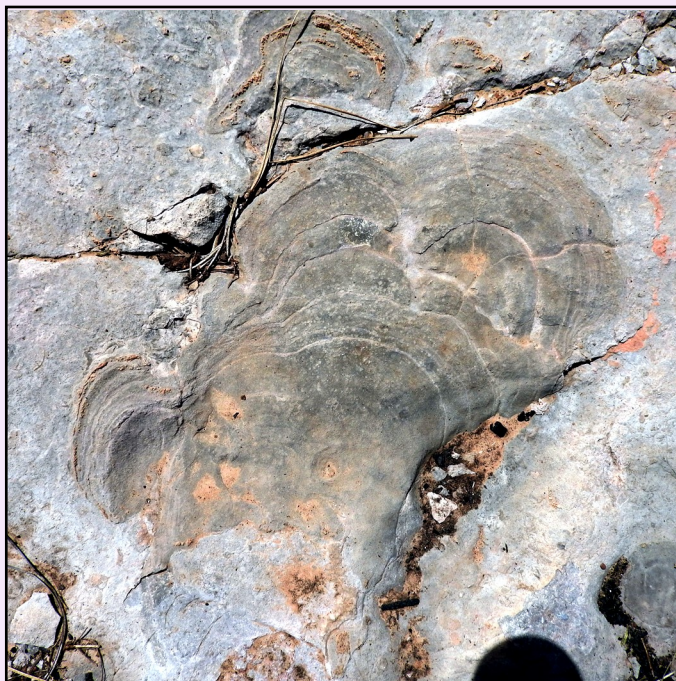


FIGURE 14 STROMATOPOROID DOME This is a view of a stromatoporoid dome, in Martin limestone, north of Payson, Gila County, Arizona. Note the thin layers. The dome is about 12" tall.

Photo by Susan Celestian

...Porifera continued from page 12

Images of modern and fossil sponges follow, in Figures 15-23:



FIGURE 15 GLASS SPONGE This is *Euplectella* sp., from the Gulf of Mexico, also known as “Venus Flower Basket”. It has silica spicules that are interconnected in an intricate web that supports the soft tissue. The species acts as host to a shrimp-like couple, who clean the sponge and glean nutrients from the sponges waste, in exchange for the protection of the sponge. Eventually, the crustaceans grow to large to escape the sponge, and so spend their whole life in their opaline cage. Image from NOAA <https://oceanservice.noaa.gov/facts/glass-sponge.html>



FIGURE 16 INTERTIDAL SPONGES OF MEXICO This a photo of orange sponges that occupy the sand flats at Cholla Bay, Mexico. They often find themselves stranded at low tide -- a very stressful situation. Good thing they are bags of water!
Note also how bumpy is the surface, and the scattered large holes (oscula).
Photo by Stan Celestian

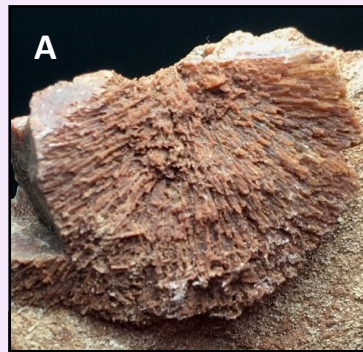


FIGURE 17 SPONGES OF THE NACO



Recently a couple of Arizona fossil hunters have discovered a number of organisms that appear to be sponges in the Naco Formation

(Pennsylvanian age), of Gila County. The upper right one (B) is *Wewokella*. Photos by John Christian



FIGURE 18 UNIQUE SPONGE *Girtycoelia beedi*, a Pennsylvanian-age sponge from Bridgeport, Wise County, Texas looks like a string of beads.
Photo by Stan Celestian



FIGURE 19 FOSSIL BUMPY SPONGE This photo emphasizes the surface bumps, such as those on the modern sponge in Figure 16.
Photo by Stan Celestian

...Porifera continued from page 13



FIGURE 20 CHAETETES These are specimens of *Chaetetes* sp., a sponge out of the Naco Formation (Pennsylvanian-age) of Gila County. It was once considered to be a coral, but the discovery of a modern species, caused the re-classification to sponge. It is characterized by vertical tubes with horizontal floors (tabulae). Note also the large open spaces, seen typically in modern sponges.

For a better view, click on the plus sign either at the top or bottom of the page. Photos by Stan Celestian

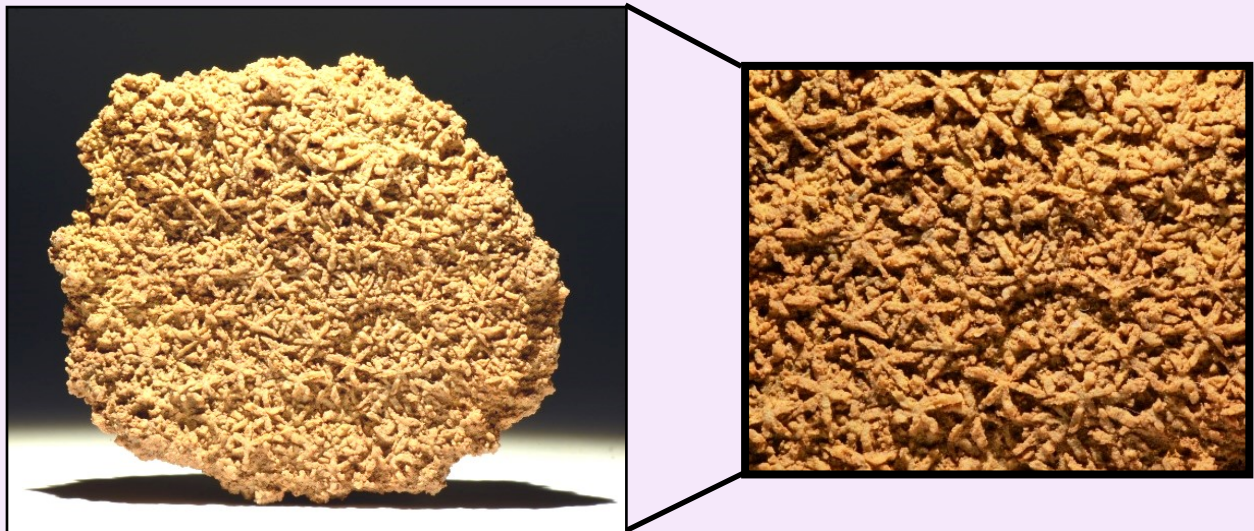


FIGURE 21 COOL SPONGE SPICULES This is *Astraeospongia meniscus*, a discoid sponge from the Niagara Formation of Decatur County, Tennessee. It has been called a "basket sponge", but its claim to fame is its 6-sided, star-shaped, originally calcium carbonate spicules. The right-hand image is a close up, of the spicules exposed at the surface. Photos by Stan Celestian

...Porifera continued from page 15

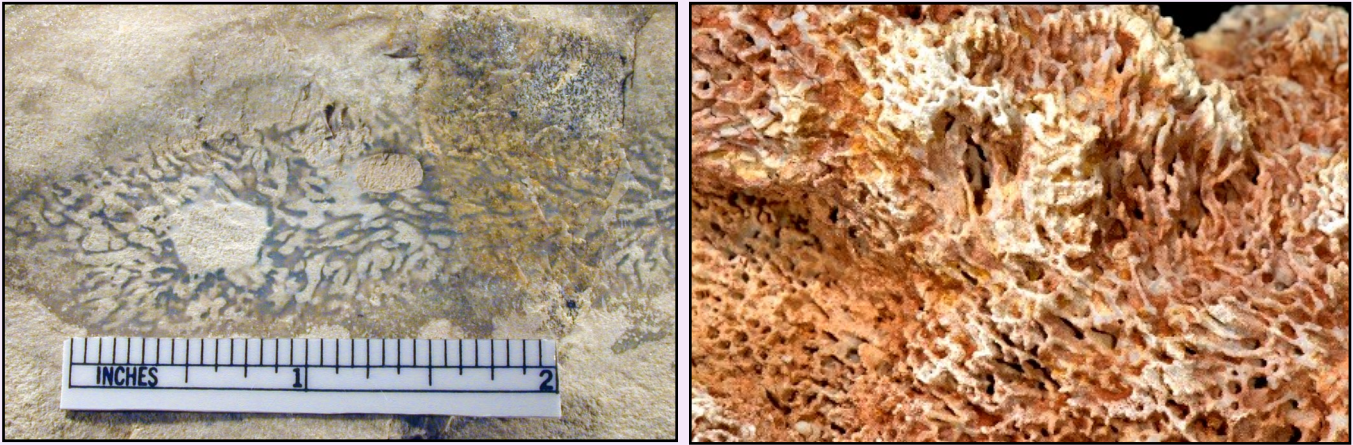
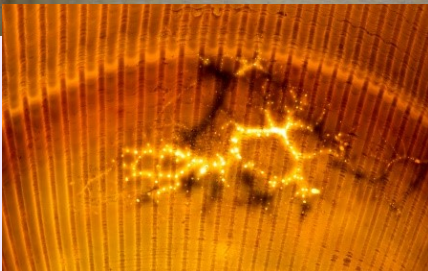


FIGURE 22 SPONGE OF THE KAIBAB Arizona's Permian Kaibab Formation often contains chert nodules that formed around decaying sponges -- *Actinocoelia meandrina*, a glass sponge. In the left-hand photo, the meandering pattern is a result of infilling of the internal canals by mud, prior to replacement by silica. The right-hand photo displays the reticulated surface, also common in modern sponges. *Photos by Stan Celestian*



FIGURE 23 BORING SPONGE Within this Giant Pacific Cockle (*Laevicardium elatum*), from Cholla Bay, Mexico we see the evidence of a sponge with a different lifestyle -- that of boring into shells, for protection from predators (even though sponges are not particularly vulnerable to predators) and turbulence. You can see the wandering gray lines in the shell. Below are two images with closer views, including one backlit to further highlight the sponge borings. Note that the lines are perforated, as the sponge drills holes to the shell surface, in order to interface with the seawater -- respiration, feeding....

Photos by Stan Celestian



GENERAL RESOURCES FOR PORIFERA

PORIFERA

<https://en.wikipedia.org/wiki/Sponge>

<https://ucmp.berkeley.edu/porifera/chaetetids.html>

Fossil Forum

ARCHAEOCYATHIDA

<http://inyo2.coffeecup.com/westgardpass/westgardpass.html#fieldtrip>

<https://en.wikipedia.org/wiki/Archaeocyatha>

STROMATOPOROIDIA

<https://en.wikipedia.org/wiki/Stromatoporoidea>

<https://ucmp.berkeley.edu/online-exhibits/stromatoporoids/>

<https://ucmp.berkeley.edu/porifera/stromatoporoids.html>

<https://www.digitalatlasofancientlife.org/learn/porifera/stromatoporoidea/>

<http://palaeos.com/metazoa/porifera/stromatoporoidea.html>

...Hematite continued from page 2

Hematite is a common mineral in Arizona, and is often confused with meteorites (it is heavy, often metallic-looking, and sometimes magnetic, due to associated magnetite) -- giving many a rockhound a flash of false delight. However, a quick streak test will reveal its true identity, as hematite leaves a rusty-red streak, while meteorites leave a faint grayish one. See Figure A.



FIGURE A STREAK TEST Firmly rub a fresh surface of an unknown mineral across an unglazed tile, to leave a streak of powder. The color of the streak may be diagnostic. In this case, the lower streak is that of a metallic meteorite, the upper streak is that of magnetite, and the middle streak is hematite. That reddish-brown streak is diagnostic for hematite.

Photo by Stan Celestian

It is found in igneous, sedimentary, and metamorphic rocks. So, how does hematite form? It may originate within a crystallizing magma, or probably more often as a precipitate out of hydrothermal ("hot water") fluids that invade a host rock. It will also form where hot magma contacts other rocks, as a product of contact metamorphism. Huge and important deposits of hematite formed in the early oceans, as a sedimentary deposit.

Conventional wisdom, has it that between 2.4 and 1.8 billion years ago, cyanobacteria (also known as "blue-green algae") began to produce oxygen through photosynthesis. Iron was an abundant component of the Earth's early anoxic (no oxygen) oceans, and as oxygen entered the system, it quickly combined with that iron, producing hematite (and some magnetite), that precipitated out to produce extensive sedimentary beds. As the oxygen was used up by the oxidation of iron, red cherts or clays formed, until the oxygen built up once again to produce hematite. In this way, Banded Iron Formations (BIF's) formed. They are very thick (hundreds to thousands of feet), geographical extensive rock units, comprised of black-gray bands of hematite, alternating with red bands of chert. See Figure I on page 17.

There are alternate, but as yet unconfirmed, explanations for the formation of BIF's; however, most are similar to this one, in that they invoke alternating periods of oxygen-depleted and oxygen-rich oceans or ocean basins. Others propose that hematite may be deposited out of metal-rich brines issuing into the ocean at active rift zones; or that specific microbes (such as some bacteria) could produce hematite by direct oxidation.

Following are some images (Figures B-I) of several of the various forms of hematite.



FIGURE B KIDNEY ORE (A) This fibrous form of hematite is iron-oxide-red and forms in the mammillary habit ("bubbly-looking"). *Photo by Stan Celestian* (B) is a black mammillary hematite. *Photo courtesy of USGS*



FIGURE C HEMATITE CRYSTAL This well-formed crystal is a bit unusual for hematite, which is more often black and massive. Locality: Brazil. *Photo by Stan Celestian*

Hematite continued on page 17....

...Hematite continued from page 16



FIGURE D (left) and FIGURE E (below) SPECULAR HEMATITE (aka SPECULARITE) The image to the left is a coarsely-bladed form, from the Planet Mine area, Mohave Co.,



Arizona; while the lower image is a sparkly aggregate of small micaceous flakes of hematite, from the Champion Mine, Houghton Co., Michigan.

Photos by Stan Celestian

FIGURE F OÖLITIC HEMATITE This form of hematite occurs where hematite precipitates out of a gently agitated



fluid. Hematite crystallizes around a 'seed' and as that rolls around, ooids (small balls) are formed. Locality:

Birmingham, Alabama Photo by Stan Celestian

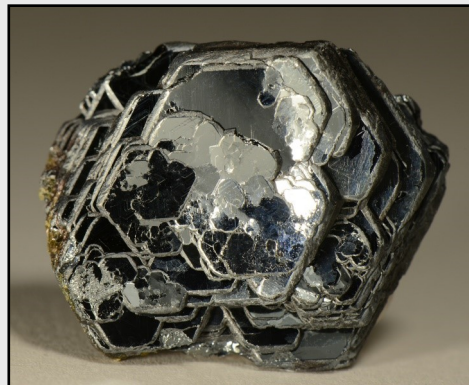


FIGURE G HEMATITE "ROSE" Rarely, as hexagonal and lamellar crystals of hematite overlap, "roses" form. Locality: Ouro Preto, Minas Gerais, Brazil

Photo by Stan Celestian



FIGURE H HEMATITE AFTER MAGNETITE This is an aggregate of octahedral magnetite crystals that have been replaced by specular hematite. Photo by Stan Celestian

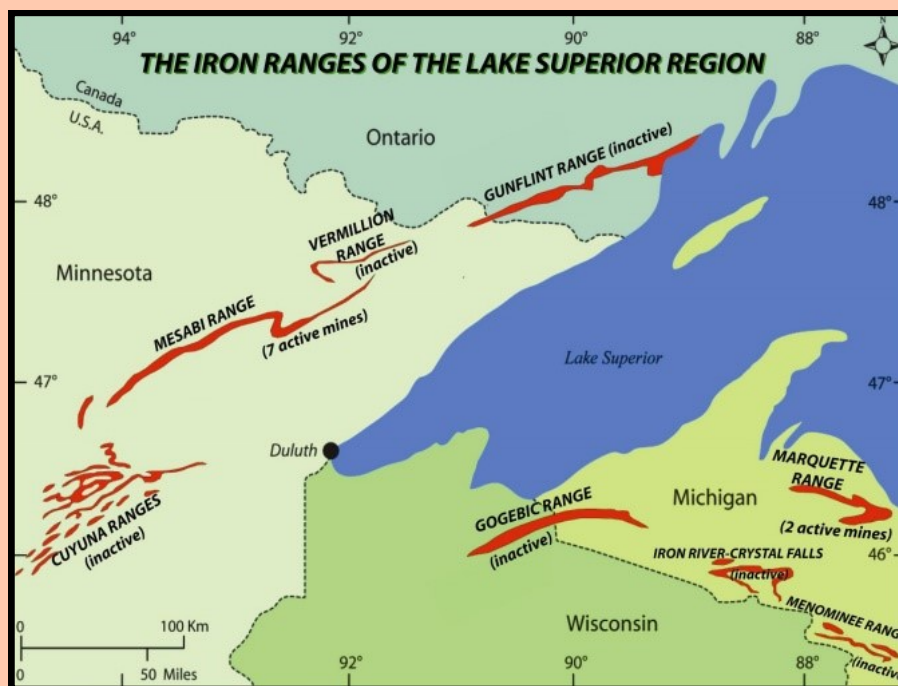


FIGURE I BANDED IRON (BIF) This is a rock formed of alternating bands of magnetite (dark) and hematite (red), from Mingus Mountain, Arizona. It represents a period during which free oxygen came (red) and waned (dark) during the Precambrian.

Photo by Stan Celestian

USES OF HEMATITE

- The primary iron ore mineral: Some of the world's largest mines are iron mines, removing up to 100 million tons of ore per year. In the U.S., iron is mined in Michigan and Minnesota (see map below).
- Red pigment (many pictographs through the ages have been made using hematite as a pigment); look for it in the ingredients list of some cosmetics
 - Radiation shielding
 - Ship ballast
 - Polishing compound (jeweler's rouge)
- Jewelry (polished and carved stones) -- not to be confused with *hematine*, which is an artificial stone (barium strontium ferrite) that resembles specular hematite, and is polished to make tumbled stones, beads, and other modern jewelry components.



Map illustrating the important iron deposited in the Lake Superior Iron Ranges. Illustration courtesy of the USGS

GENERAL RESOURCES FOR HEMATITE

<https://en.wikipedia.org/wiki/Hematite>
<https://geology.com/minerals/hematite.shtml>
<https://www.minerals.net/mineral/hematite.aspx>

<http://webmineral.com/data/Hematite.shtml#.XksBqWhKg2w>
<https://www.mindat.org/min-1856.html>

TUCSON GEM AND MINERAL SHOW 2020

IMPRESSIONS BY STAN CELESTIAN

The Tucson Gem and Mineral Show has always been an “experience”. Where else can one see, without exaggeration, “World Class Minerals” in a single event. The mineral specimens at the show rival those in the world’s best museums. As a guy who appreciates mineralogy, crystallography, and the “art” of nature, the TGMS expands my knowledge, value and respect for Geological specimens. There is also the “WOW!” factor in seeing amazing crystal forms and fantastic specimens that I have read about, or of which I have only seen pictures. The TGMS offers crystals, gems, meteorites and even fossils to view that are worth the price of admission.

And then, as a collectors, (Sue and I have our own mini-museum) the TGMS and its satellite shows at motels around town, offer us the opportunity to add to our collection. Here again is another “WOW!” factor. Some wonderful specimens are for sale and “WOW!”, look at this one. And then again, “WOW!” look at the price of that one.



For example, at the show were a couple of nice Wulfenite crystals from the Red Cloud Mine. Yep, the same Red Cloud Mine that we have visited on past club field trips. Those numbers on the top right hand corner of the tags (8500 and 5500) are not catalogue numbers, they are the prices.(!) When collectors talk about prices and refer to “Tucson Show” prices, this is what they are referencing: Take a normal price, double it and then add a zero or two. I have a new appreciation for the wulfenites I collected on our field trips and look forward to the next trip to the Red Cloud Mine.



This is a stunning crystal of Rhodochrosite, a manganese carbonate. It is from the Sweet Home Mine in Colorado. (Collectors are also very aware of the crystal’s area of origin for some reason.) Like many carbonate minerals (like Calcite) the crystal form is a rhombohedron. And like many carbonates, it also has rhombohedral cleavage. Note in this picture the crystal is displaying incipient cleavage planes, i.e., very slight displacements that interrupt the flow of light through the crystal into darker and light areas. If tapped just right with a hammer, it would break along those planes. It would also slowly dissolve in hydrochloric acid. Neither of these tests would be advised on a specimen valued at around \$1 million.

...Tucson continued from page 19



China is a big country, and over the last couple of decades has been contributing great crystal specimens to collectors. This is a large Fluorite at about 14 inches wide. The color is a pleasing sky blue. Fluorite is a good mineral to collect as it is not delicate (as in these massive cubes), is fairly stable as it does not spontaneously fall apart (as does sulfur and a few other minerals), and it comes in a large variety of colors and forms. Crystal specimens can be very affordable. The only downside is that it does have 4 very good directions of cleavage, so one has to closely inspect corners or edges for “dings”, and with a hardness of only 4, it is easily scratched.

An important part of the show are the display cases put in by collectors. The Tucson Show committee comes up with a show theme every year. This year's theme was **World Class Minerals**, although not every collector wants or is capable of following the theme. (Next year's theme is “Rocks that Glow” - fluorescent rocks and minerals.)

Every display case has its own story. These 4 specimens are from the same case created by a young woman (25 years old) from California. These would certainly qualify as “World Class Minerals”.



The first is a green (back-lit) Vivianite pair of crystals. The lighting shows the clarity of the crystals and the perfection of their form.

Next (below left) is an Imperial Topaz. Lighting for this specimen is from the bottom to show the specimen's golden color and, again the perfection of the crystal. By the way, most crystal specimen are more aesthetically pleasing (and therefore worth more) when artistically perched on a small piece of the matrix rock as is this crystal.

Fluorite (below center) has many pleasing colors and, as in this specimen, it can be “zoned” -- that is, the colors can change due to slight differences in composition. Again, back lighting can really bring out these subtle differences in color.



The last one is a spectacular specimen of Rhodochrosite. The crystals are a beautiful, uniform red color. The crystals are perfect and it displays nicely on its base of matrix minerals.



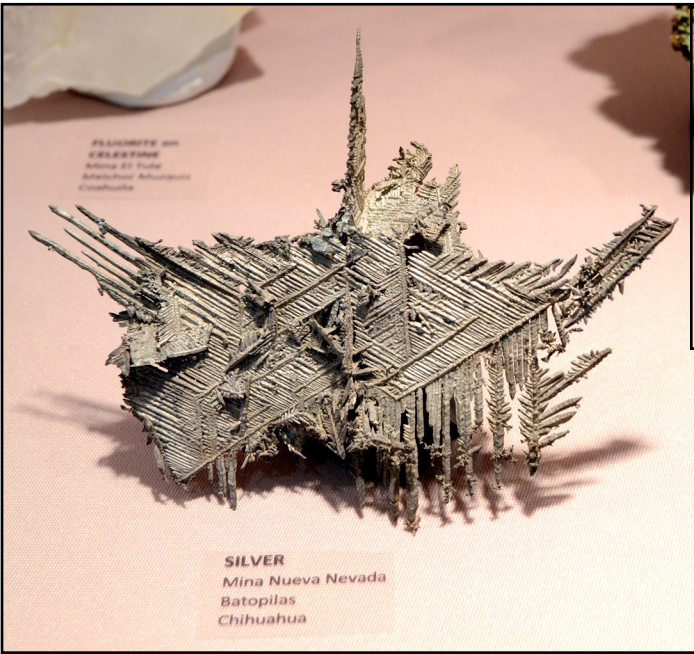
Tucson continued on page 21....

...Tucson continued from page 20



There are also competitive displays. This is a competitive thumbnail display. (Thumbnails are specimens that fit in a 1 1/8 inch cube.) Competitors are judged on the diversity of crystals, their perfection, their uniformity of size (none much bigger or smaller than the others), the way they are mounted, and even the way in which they are labeled. Winners get cash.

In many ways, thumbnail collecting can be very rewarding. Their prices can be very affordable (although some can cost well over \$10,000), and being small, they can be easily displayed and stored.



This is Native Silver (native in the mineralogical sense means uncombined with other elements). Other native minerals are copper, gold, platinum, bismuth, carbon (diamond and graphite), iron, sulfur, just to name a few.

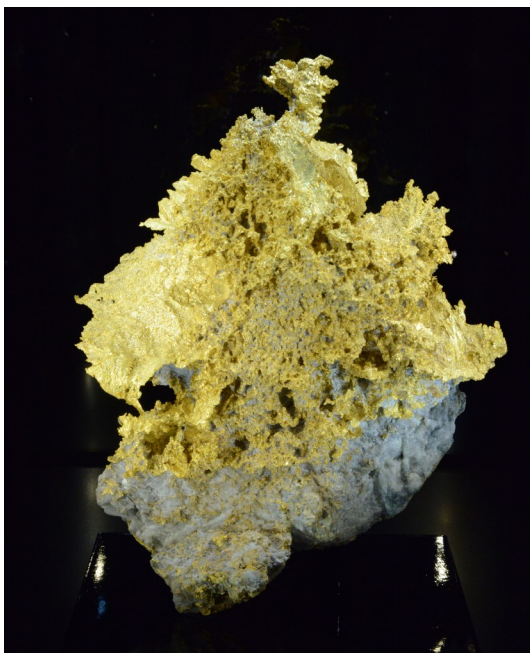
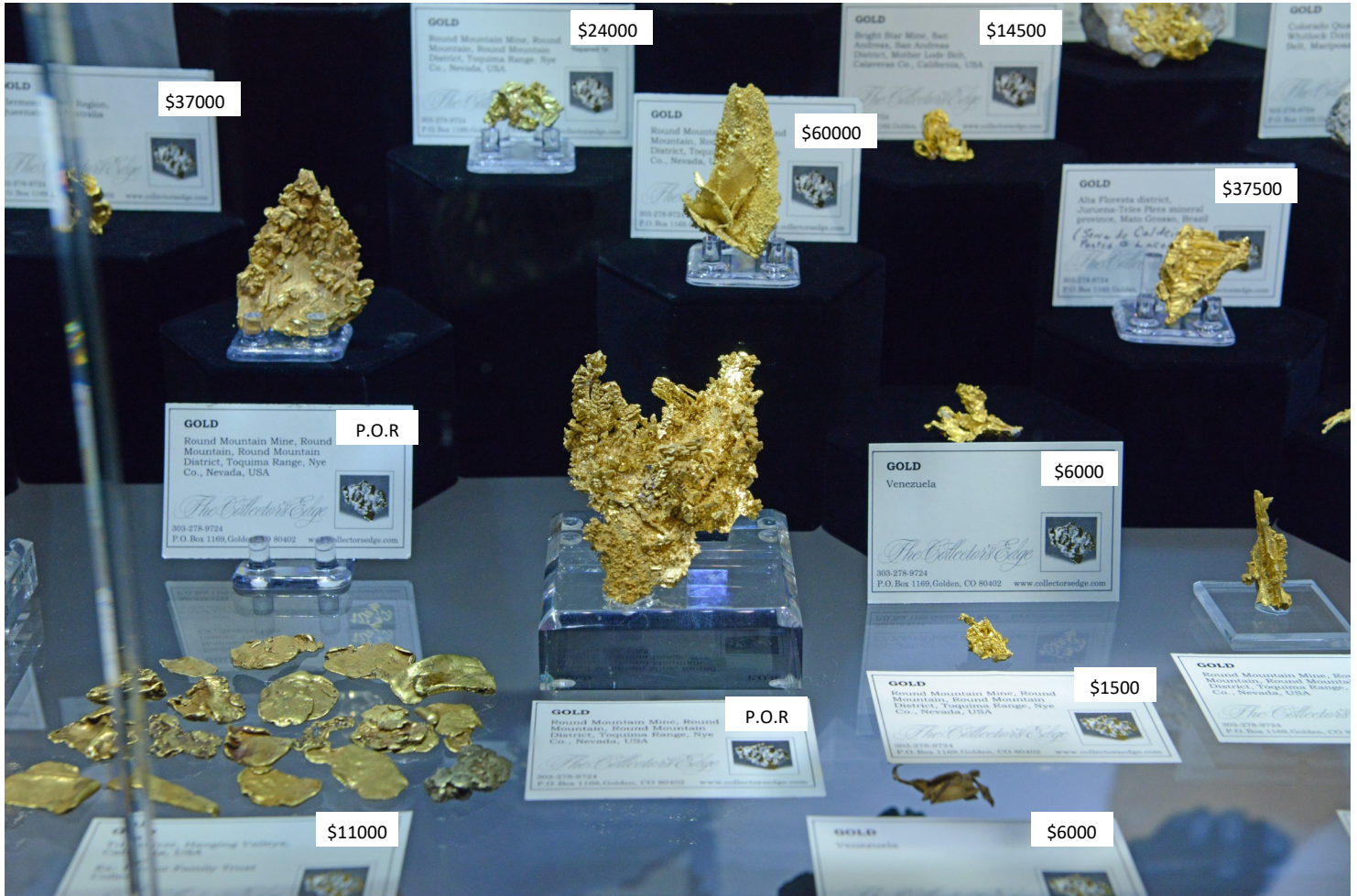
This Native Silver nicely displays a herringbone crystal growth form and is very symmetrical. To me, it is always amazing how the actual silver value of this piece, on the order of \$50 or \$60, is eclipsed by the price of the specimen, on the order of \$10,000 or more.



This is a native copper and has just a couple dollars of copper in it, BUT, it is a Native Copper nugget with a name! Take a guess at what it is called.

...Tucson continued from page 21

Native Gold is the emphasis of this case. (I enhanced the price tags for easier reading.) A couple have as the price P.O.R. That means Price On Request; or if you have to ask, you can't afford it. Gold specimen prices are never at the spot value for the metal. The price depends on the size of the piece, their shape and luster -- and if they are crystalline they are worth a lot more. Large pieces of Native Gold are rare and therefore demand even higher prices. Occasionally an exceptional piece is given a name. When that happens the price becomes astronomical and even unbelievable. Totaling the prices of specimens shown here is \$250,000 ! And that does not include the P.O.R.'s and this is only about 1/3 of the case. "WOW!"



This one is the Dragon's Lair from Western Australia, and I estimate it at about 24-28" high. It was at the show last year still encased in quartz. The Collector's Edge (a high end dealer) used hydrofluoric acid to etch away most of the quartz to expose most of the Native Gold.

The story is that the miners were at the end of their money and about to close down the mine when they discovered these very large pieces. The moral to that story is that you should spend all of your money on the chance you may find gold.

Now it is a "World Class" gold specimen worth millions. Can you see the dragon?

For more on the story of this remarkable find:

<https://www.abc.net.au/news/2018-09-10/rich-gold-seam-half-a-kilometre-deep-in-kambalda/10219576>

...Tucson continued from page 22



It takes pretty much a day to see the main show (at the Tucson Convention Center), if you see all of the displays and vendors. And you could spend a week travelling around to look at the many satellite shows. This case at the Main Show is an exhibit from the Mineralogical Association of Dallas (MAD). They always have great mineral specimens and attract many viewers. Thursday is the best day to visit the dealers as they have lots of choices. Friday is a day to avoid because school groups visit the show. Sunday is a good day to perhaps get a deal on a specimen as dealers want to lighten their load.



Sue and I were invited to put in a display. Although we don't have any "World Class Minerals" the display options are very open. We chose our best "Self Collected" minerals. In our opinion it was one of the best displays at the show.

We also made a few purchases for our collection. We absolutely enjoy trilobites. We have a favorite dealer - Horst Burkard. He is from Germany and does a fabulous job preparing



fossils. This trilobite is from Morocco.

For fun I created this stereo image. To see it in stereo use the cross-eyed technique. (Your left eye looks at the right image and your right eye looks at the left image.)

We also purchased a few mineral specimens. These are Garnets on Epidote from Greece.

We are looking forward to next year's show. See you there...



UPCOMING FIELD TRIPS & MEETINGS

WHEN: Saturday, March 7, 2020

WHERE: Bullard Mine

WHAT: Copper Minerals

MEET: TBA

LEADER: Ed Winbourne

WHEN: Saturday, March 28, 2020

WHERE: Prism & Blue Cube Mines

WHAT: Fluorite

MEET: TBA

LEADER: Dave Haneline?

WHEN: Saturday, April 4?, 2020

WHERE: Planet Mine

WHAT: Specular Hematite, Copper Minerals

MEET: TBA

LEADER: Stan Celestian

WHEN: Saturday-Sunday, April 18-19, 2020

WHERE: Nuevo Corrales/Devil's Gate & Ruby

WHAT: Geodes & Ghost Town

MEET: TBA

LEADER: TBA

OTHER: Possible overnight trip

WHEN: Friday-Saturday-Sunday, May 1-3, 2020

WHERE: Topaz Mountain, Utah

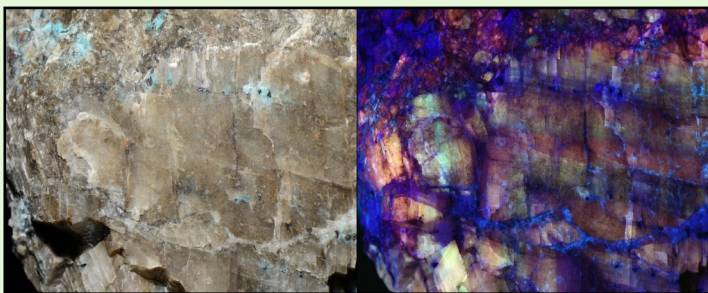
WHAT: Topaz

MEET: TBA

LEADER: Stan Celestian

DATES SUBJECT TO CHANGE

Bill and the field trip committee will be actively looking for productive spots for field trips. If you have any suggestions, you are encouraged to contact him at bfreese77@cox.net



Calcite from the Bullard Mine. On the left it is exposed in plain light, on the right under short wave UV.

FACEBOOK

Visit and join the club page periodically. See what is happening, and boost our visibility on the web. Go to: [The Daisy Mountain Rock and Mineral Club](https://www.facebook.com/DaisyMountainRockandMineralClub). It is set up so you can post photos of outings or related items.

AWARD-WINNING WEBSITE

<http://www.dmrmc.com/>

If you have comments, contact Nancy Gallagher.

GROUPWORKS

As a DMRMC club member, your name should be available at <https://app.groupworks.com/#/login>, and you should receive an email linking you to registration. Create an account and receive reminders about club events, meetings, and important club information. You may post pictures and information -- all seen only by club members.

Officers, Chairpersons, & Trustees

President: Ed Winbourne.....ewinbourne@gmail.com

Vice President: Bill Freese..... bfreese77@cox.net

Secretary: Rebecca Slosarik .. rslosarik1@gmail.com

Treasurer: Cynthia Buckner...Cbuckrun1@q.com

Publicity: Jessie Redmond...

Membership: Tiffany Poetsch tnpoetsch@gmail.com

Editors: Susan & Stan Celestian.....
azrocklady@gmail.com

Field Trip: Bill Freese ... bfreese77@cox.net

Show Chair: Ed Winbourne

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| Jessica C. | Rebecca S |
| Johnaton M | |

Meetings are held the **1st Tuesday of the month** at the **Anthem Civic Building**, 3701 W Anthem Way, Anthem, AZ 85086. General meeting at 6:30 pm. We **do not meet in July or August.**

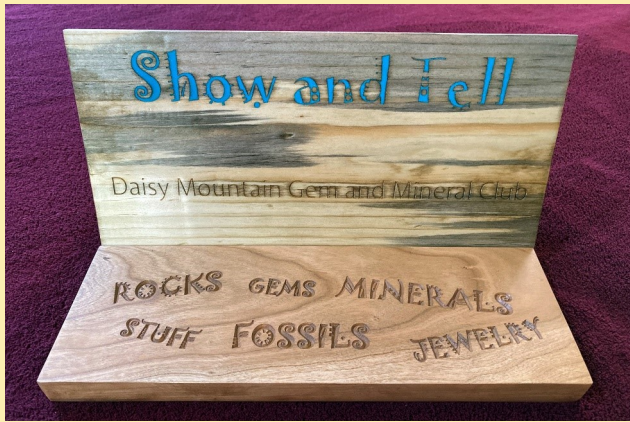
DMRMCLUB@GMAIL.COM

Membership Dues:

First year \$30, then \$20.00 Adults per Person
First year \$45, then \$25.00 Family (2 people)

Meeting Dates for 2020

Jan 7, Feb 4, Mar 3, Apr 7, May 5, June 2, Sept 1,
Oct 6, Nov 3, Dec 1



Share!

Part of the fun of being in a rock club is sharing with members. Have you found a cool rock -- recently or in the past? Have you made something out of a rock or mineral?

Bring an item in to the monthly and tell its story.

Everyone who brings in something for Show & Tell will get an extra ticket for the attendance/nametag raffle.

ROCKY MOUNTAIN FEDERATION SUMMER MULTI-FEDERATION FIELD TRIPS JUNE 13-16, 2020

The RMF Show & Convention is being held in Big Piney, Wyoming June 19-21. Prior to the event, there will be collecting trips available. Planned already is Blue Forest for petrified wood (<http://blueforestpetrifiedwood.com/about-us/>) and Green River Formation for fish fossils (\$fee). Others are in the works.

Interested in the field trips? Contact Doug True dtruefossils12@yahoo.com
Interested in the Show? Contact Jim Gray jimgray@wyoming.com

For more information/registration go to:

https://mcusercontent.com/a2ce2966ec6188e041bd58c21/files/ab24fc42-f110-4286-b2c5-b5af797e2fca/2020_RMFS_Convention_in_Wyoming_Packet_REV_1.pdf. If you think you'd like to

attend, you might want to start making campground or motel reservations. The closest facilities will fill up fast -- there probably aren't any motels closer than 20-25 miles away, and you'll want to get a spot as close as you can.

NEEDED: QUALITY MINERAL (or OTHER) DONATIONS WITH LABELS -- for monthly raffle prizes; and for raffle, door prizes, and sales tables at the annual show. If you have specimens to donate, please see Robin Shannon. The Daisy Mountain Rock and Mineral Club is a 501(c)(3) non-profit organization, and will gratefully acknowledge your donation with a Tax Deduction Letter. Thank You!

NOTE FROM THE EDITORS

Have a geological interest? Been somewhere interesting? Have pictures from a club trip? Collected some great material? Send us pictures -- or write a short story (pictures would be great).

Deadline for the newsletter is the 22nd of the month.

Mail or Email submissions to:

Susan Celestian
6415 N 183rd Av
Waddell, AZ 85355
azrocklady@gmail.com

WIRE-WRAPPING CLASS

4:30-6:30 pm

Prior to the meeting

Bring: cab or stone, about quarter-sized or larger; 26 and 18 or 20 gauge copper-based wire; round nose pliers and flush wire cutter, beads (optional), little clamps, masking tape, E6000 jewelry glue.

Free, but donations are appreciated.

Questions? Contact Jennifer at Jennifer@eliteshuttersandblinds.com

FOR MARCH

BRING PAPER & A PEN TOO!



Visit <http://rmfms.org/> for news about conventions, events, and associated clubs. If you are travelling, you might want to contact a club local to your destination. Maybe they have a field trip you could join, while in town.

UPCOMING AZ MINERAL SHOWS

February 28-March 1 - Clarkdale, AZ Mingus Club; Clark Memorial Clubhouse Auditorium, 19 N Ninth St.; Fri-Sat 9-5, Sun 10-4; Admission: free.

February 29-March 1 - Mesa, AZ Apache Junction Gem & Mineral Club; Crimson HS, 845 S Crimson Rd; Sat 9-5, Sun 10-4; Admission: adults \$3, students (w/ ID) \$1, children 12 & under free.

March 13-15 - Cottonwood, AZ Cottonwood Gem, Mineral, Jewelry & Wellness Festival; Verde Valley Fairgrounds, 800 Cherry St; Fri-Sat 10-6, Sun 10-4; Admission: free.

March 14 - Coolidge, AZ Pinal Gem & Mineral Society; Pinal Geology and Mineral Museum, Artisan Village, 351 N Arizona Blvd; Sat 9-2; Admission: free. *See poster on page 27.*

March 21-22 - Anthem, AZ Daisy Mountain Rock & Mineral Club; Anthem School, 40100 N Freedom Way; Sat 9-5, Sun 9:30-4; Admission: adults \$3, seniors & youths \$2, children under 12 free. *See poster on page 28.*

April 18 - Cornville, AZ Verde Valley Rockhounds; Windmill Park, 9950 E Cornville Rd; Sat 9-5; Admission: free. *See poster on page 29.*

May 2-3 - Kingman, AZ Mohave County Gemstoners; Kingman Academy of Learning HS, 3420 N Burbank; Sat 9-5; Admission: free.

May 29-31 - Flagstaff, AZ Coconino Lapidary Club; Fort Tuthill County Park Fairgrounds - Commercial Building, 2446 Fort Tuthill Loop; Fri-Sat 9-5, Sun 9-4; Admission: free.

June 19-21 - Big Piney, WY Wyoming State Mineral & Gem Society PLUS Rocky Mt Federation Convention; Sublette County Fairgrounds, 10937 Hwy 189; Fri-Sat 9-5, Sun 9-4; Admission: adults \$2, children free. *See poster on page 30.*

July 11-12 - Lakeside, AZ White Mountain Gem & Mineral Club; NEW VENUE Country Court Event Hall, 3369 W White Mountain Blvd.; Sat 9-6, Sun 10-4; Admission: adults \$2, children under 16 free.

July 31-August 2 - Prescott Valley, AZ Prescott Gem & Mineral Club; Findley Toyota Center, 3201 N Main St; Fri-Sat 9-5, Sun 9-4; Admission: adults \$5, seniors, vets, students \$4, children under 12 free.

If you are travelling, a good source of shows AND clubs is <http://the-vug.com/educate-and-inform/mineral-shows/> or <http://www.rockngem.com/ShowDatesFiles/ShowDatesDisplayAll.php?ShowState=AZ> For out-of-the-country shows: <http://www.mindat.org/shows.php?current=1>

YOU ARE INVITED...



TO THE AZ MINING, MINERAL AND NATURAL RESOURCES EDUCATION MUSEUM 'S SECOND PUBLIC OUTDOOR EVENT!

Join us on March 28th for stamp mill demo (11am @ 1pm), kids mineral giveaways, and public meet and greet. More info on our website at ammnre.arizona.edu.

SATURDAY
3.28.2020
10:00am - 2:00pm

Arizona Mining, Mineral and Natural Resources Education Museum
1502 W. Washington St.
Phoenix, AZ 85007

5th ANNUAL TOUCH OUTER SPACE

PINAL GEM & MINERAL SHOW

MARCH 14, 2020

PINAL GEOLOGY & MINERAL MUSEUM: 351 N. ARIZONA BLVD., COOLIDGE
9:00 AM - 2:00 PM

DR. CARLETON MOORE WITH PIECES OF MARS, THE MOON, THE ASTEROID VESTA AND METEORITES.
MINERAL DEALERS, EARTH SCIENCE EDUCATION, TOUR MUSEUM.



2020 ANTHEM GEM AND MINERAL SHOW

SATURDAY MARCH 21 9 AM - 5 pm
SUNDAY MARCH 22 10 AM - 4 PM

ANTHEM SCHOOL
41020 N. FREEDOM WAY, ANTHEM

BRING THE KIDS !

KIDS CORNER: LOTS TO DO
EGG CARTONS, GAMES, PRIZES, HANDS-ON

VENDORS

JEWELRY, GEMS, MINERALS, FOSSILS, BEADS, WIRE WRAPPING, GEODES AND MORE

RAFFLES & DOOR PRIZES

SPECIAL ULTRA VIOLET DISPLAY

EXPERTS WILL IDENTIFY YOUR ROCKS

ADULTS \$3, SENIORS AND STUDENTS \$2

KIDS 12 AND UNDER ARE FREE

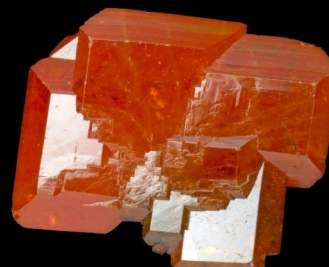
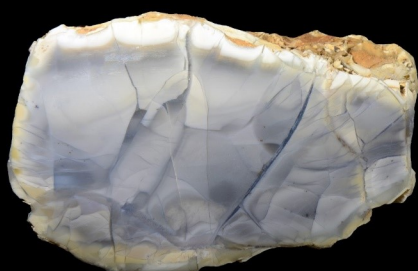
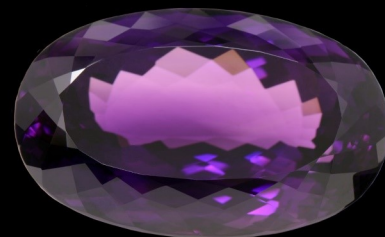
SPONSORED BY

DAISY MOUNTAIN GEM AND MINERAL CLUB

FOR MORE INFORMATION CONTACT:

ED WINBOURNE (978-460-1528)

EMAIL: ewinbourne@gmail.com



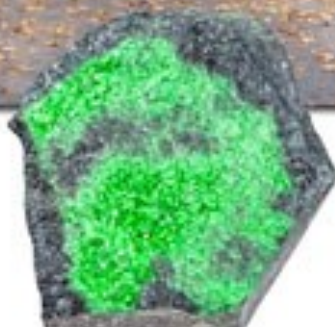
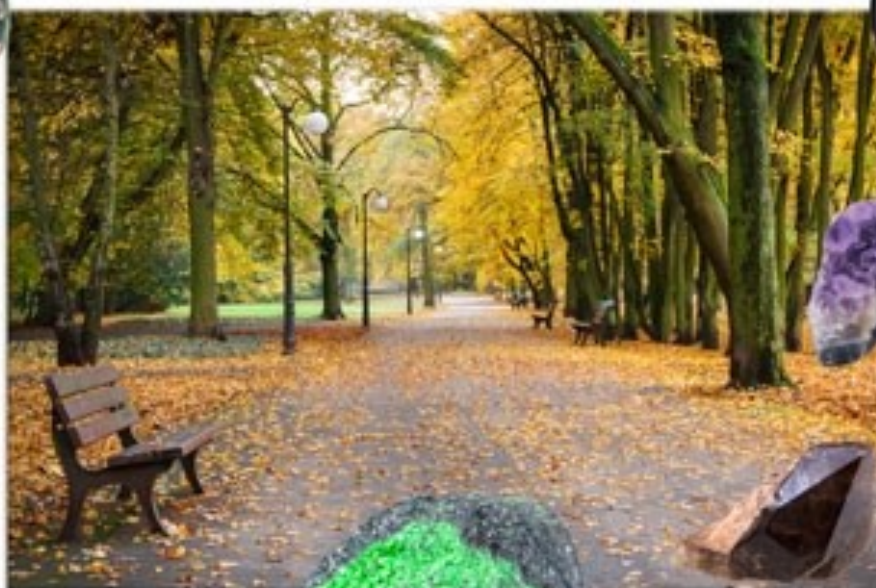


Verde River Rockhounds
Present
“Rocks in the Park V”
Rock and Mineral Sale



Saturday April 18, 2020
9 A.M. - 5 P.M.

Windmill Park, Cornville Road
Cornville, AZ 86325



Rocky Mountain Federation of Mineralogical Societies convention
&
Wyoming State Mineral & Gem Society show

Gem & Mineral Show

2020

Theme

*ROCK & ROLL WITH
WYOMING ROCKS*

Hosted by the Sublette County Rock Hounds

June 19th, 20th, & 21st

at the Sublette County Fairgrounds
10937 Hwy 189, Big Piney, Wyoming

Friday & Saturday 9-5, Sunday 9-4

*Dealers, lectures, demonstrators, exhibits, field trips, Mr. Bones, Fossil
Butte National Monument walking fish fossil, fluorescent mineral
display, kids' activities, food concession & more!*

Admission: \$2.00 adults, kids free



and a funding contribution made by Pinedale Travel & Tourism Commission www.VisitPinedale.org

Contact: jimgray@wyoming.com