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GNEISS TIMES

Wickenburg Gem & Mineral Society, Inc.
P.O. Box 20375, Wickenburg, Arizona, 85358
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www.wickenburggms.org

The purpose of this organization shall be to educate and to provide fellowship for people interested in

NON-CLASTIC SEDIMENTARY ROCKS — Diatomite & Coal*

The last two primary sedimentary rock types are diatomite and coal -- both with organic origins. In other words, neither rock is composed of minerals. Refer to Table 1.

Coal occurs in coal beds or coal seams. While coal formed during most geologic periods, the Pennsylvanian Period is characterized by coal deposits across the northern hemisphere. In fact, the span of time called the Mississippian and Pennsylvanian Periods in the U.S., was dubbed the Carboniferous Period in Europe, due to the prominence of coal deposits.

Coal is brown to black, and composed of plant

Diatomite & Coal continued on page 6…….

NON-CLASTIC SEDIMENTARY ROCKS

LIMESTONE - composed of precipitated crystals of calcite; will fizz in acid * Crystalline Limestone - fine to sugary calcite crystals, without fossils * Fossiliferous Limestone - fine calcite crystals, usually marine fossils * Oolitic Limestone - composed of small spheres of calcite * Coquina - composed of nearly only shells and shell fragments * Chalk - composed of the microscopic calcite shells of planktonic animals (coccoliths, foraminifera) * Travertine - coarsely crystalline calcite (very sugary), often banded in various colors (browns, reds, blacks)
DOLOSTONE - similar to limestone, but composed of dolomite; will fizz weakly after powdered; generally devoid of fossils
CHERT - microcrystalline quartz; conchoidal fracture; waxy luster; any color * varieties include flint, chert, jasper, chalcedony, agate, opal (although chalcedony, agate, opal do differ a bit from flint, chert, jasper)
ROCK SALT - composed of halite; cubic cleavage; salty taste
GYPSUM - composed of gypsum; easily scratched by fingernail * varieties include: alabaster (massive, sugary); selenite (generally clear); satin spar (fibrous)
DIATOMITE (aka diatomaceous earth) - composed of the microscopic silica shells of diatoms; similar to chalk, but will scratch glass will not fizz in acid, and is less dense.
COAL - composed of the carbonized remains of plant debris; brown-black; low density * varieties include: peat (loose visible plant debris), lignite (brown, with some visible plant remains), bituminous ("soft coal", black)

TABLE 1 Non-Clastic Sedimentary Rock Chart

It's All About the Dinosaurs (Bones, Poop, and Stomach Stones)*

By Larry Knolls

On the 24th of September a group of adventurers gathered in Green River, Utah to find the Dinosaurs. Led by Karen and Bill Coulter, Noey and Larry Knoll, Terry Warren, Al and Erma Roe, Avie (a young man Karen picked up at the Laundromat), and a group from the Utah ATV Association, gathered just off the I-70 at Floy Junction. After a couple days of rain, Saturday morning dawned bright and sunny -- a perfect day for hunting Dinosaurs. The dirt roads into the area are fairly well-maintained, but a high clearance vehicle is recommended. I am glad I didn't have to find the area where the dinosaurs are, as roads ran everywhere. After stopping along the way to check out some interesting spots, we arrived at the dinosaur's hide-out, or so we thought. False alarm. This location was only the poop of the dinosaurs. Everywhere you looked there were piles of poop. Of course. all of us had to collect some samples, so we could show our friends. You had to collect fast, as it was time to find the dinosaurs.

The dinosaurs were just a short trip from the poop. The only problem was the road ran out, and it was time to hike. Everyone agreed that we should have lunch before we started our trek up the canyon to the dinosaurs. (If we were going to die, it might as well be on a full stomach.) As it turned out there were only a couple places on the trail that were a

Dinosaurs continued on page 5…….

INSIDE THIS ISSUE

WGMS ROCK & MINERAL SHOW
Nov 26 & 27, 2016

Sat 9-5; Sun 9-4

Hassayampa Elementary School

VOLUNTEER!!! VOLUNTEER!!!! VOLUNTEER !!!!!

- ☺ **Lend an hour or two (especially Kid's Table & Fluorescent Room)**
- ☺ **Help empty storage shed at 9am on Wednesday, November 23**
- ☺ **Help set up show at 7am on Friday, November 25**
- ☺ **Donate quality slabs, rocks, or other items for the Silent Auction**
- ☺ **Donate items for Door Prizes**
- ☺ **Enter the Best Rock Contest**
- ☺ **Plan to attend and support the vendors**
- ☺ **Help take down after the show**

Photo by Stan Celestian

Show Gold Nugget

(And it is a beaut!)

Origin: Alaska

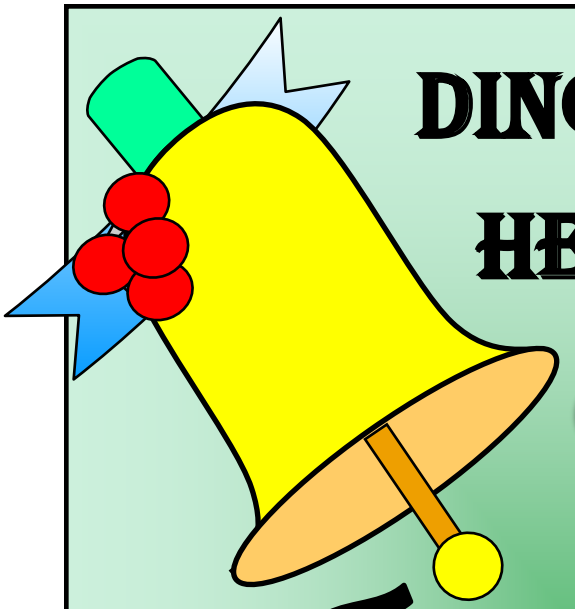
Weight: 6,000,000 grams (or is that 6 grams?)

Tickets: $1 each or 6/$5

For other photo of nugget, go to

https://www.flickr.com/photos/78143623@N03/30968455015/in/dateposted-ff/

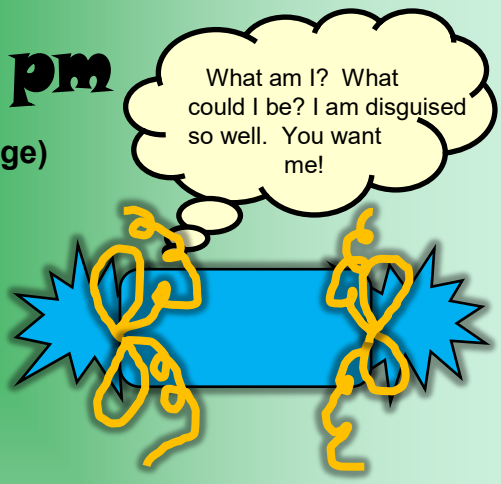
DING DONG! DING DONG! HEAR YE, HEAR YE!!!



Club Christmas Party

Friday, December 2
6:00 pm

(Note meeting day change)



Potluck and White Elephant Gift Exchange

- Club will supply: ham, turkey, drinks, paper plates, napkins, & plasticware
- Bring your favorite side dish and/or dessert to share.
- Bring a white elephant gift (optional) -- make it look cool, mysterious, intriguing

Come early -- we eat at 6, short meeting (elections) at 7, and then..... Karen has a new gift exchange game -- it is a SURPRISE!

Meeting Minutes — November 11, 2016

The meeting was called to order by Craig at 7 PM. The pledge of allegiance was recited. There were 31 members present, including three new members. The October minutes were read by the secretary, Judy, and accepted. The treasurer's report was read by the treasurer, Debbie, and accepted. Thanks were given to Marty and all others that helped with the group in the past year while Craig was not present.

Old Business discussed: The rock show was discussed. Beth and Dale need people to help clean out the shed on the Wednesday before the show. Banners need to be put up on the Monday prior to the show. Set up will be on Friday, the day after Thanksgiving, beginning at 7 AM. Vendors will be arriving at 11 AM, and as many people as possible will be needed to assist in setting up. Sign-up sheets for working at the show are circulating around the room. Contributions are needed for the children's table, best rock contest, and the silent auction. We need quality rocks, slabs, and jewelry for the silent auction. Food will be provided by La Canasta restaurant for breakfast on Friday. The music club at the school will provide food for the show as a fund raiser for them. Help is also needed for teardown on Sunday. Members are requested to park at the art club to allow guests to park closer to the show.

Terry and some helpers cleaned out the rock room and moved the equipment to the new location.

The trip to the McGuffey ranch was discussed. Several people were on the trip and had a good time. John and Jason headed a trip to the Hassayampa, Rincon-Blue Tank Road, and Monte Cristo Mine areas where lots of rocks were collected, and everyone had a good time.

New Business discussed. Craig has asked all to give any e-mail updates or any clarifications or changes to him. The Christmas party was discussed. Karen and Bill will be in charge of the party. Al and Erma will bring the turkey, Robbie will bring the ham, and the rest of the meal will be a

Continued…….

potluck. There will be a new game for the gift exchange. Bring a white elephant gift if you wish to participate in the game. Dinner will begin at 6 PM, followed by the meeting and elections. The gift game will be after the meeting. The party will be on December 2, 2016. Elections will be held at the December meeting. Places to go for trips are needed. Craig would like to do a surprise trip. He will pick a place to go and surprise us on the location at the time of the trip. There is interest in doing another black light trip.

Show and tell was done. Nine members brought rocks to show. John won the raffle.

Door prizes were won by Al, John, Alyson, Eric, Marty, and Susan.

The meeting was adjourned at 7:55 PM.

Respectfully submitted, Judy, Secretary

Ward Charcoal Ovens, located 20 miles south of Ely, Nevada. They were built in 1876, by Italian masons, known as *carbonari* (for their specialty building ovens). The ovens produced charcoal, used in the smelting of silver ore from the mines at the town of Ward. The smelters needed 16,000 bushels of charcoal every day. They are 30' high, 27' diameter, 2' thick at the base.
Photo by Susan Celestian

NOTES FROM THE EDITOR

Have a geological interest? Been somewhere interesting? Have pictures from a club trip? Collected some great material? Write a short story (pictures would be great). I'd like topic suggestions also.

Deadline for the newsletter is the end of the month.

Mail or Email submissions to:
Susan Celestian, editor
6415 N 183rd Av
Waddell, AZ 85355
azrocklady@gmail.com

.....Dinosaurs continued from page 1

challenge for us seniors. It's a good thing Karen picked up Avie in the laundromat, as he was a big help in making sure the hiking challenged got over some of the obstacles on the trail. There were some stomach stones on the trail along with some other nice looking specimens. But who wanted to pick up rocks and carry them up the trail and back down again, so everyone said "oh I'll get them on the way back down". That never happened, because at the dinosaur site there were plenty of stomach stones, nicer than what was on the trail. Unfortunately, one of the sites had been vandalized, and the smaller dinosaur had been removed by professionals, as you could see where they laid out their grid lines. So not too much of the dinosaurs to see. There were still some small bones laying around, but it is against the law to take the bones, so they are still laying around for the next people to enjoy. The hike back down the canyon was somewhat easier than the trip up, even though all were carrying buckets of their treasures with them.

We still had some daylight left, so Bill asked if we wanted to go get some travertine. Despite the semi-grueling hike to the dinosaurs, we all seemed to have enough energy to continue with our adventure. He took us to a spot that looked as though it had been commercially mined at one time. What had been left will make some beautiful stone for the garden, or the smaller pieces as polished specimens. After collecting for a while, it was every man for himself. Bill and the Utah gang went to the river. Terry and Al weren't quite done rockhounding. As for Karen, Avie, Noey, and Larry -- they had enough fun for one day, so it was time to see if we could find our way back to camp. The adventure was complete and a good time was had by all.

For those of you who missed the fun, maybe we can talk Bill and Karen into a repeat performance at some time. Besides the Dinosaurs and travertine, this area is rich in agate and jasper, along with a few other gems.

**Editor's note: Dinosaur poop is known as coprolite. Microscopic identification of organic remains (bone fragments, plant material, pollen) will confirm a siliceous mass as a coprolite. That identification also provides details with regard to the area's plant life and other animals that occupied the region, during the tenure of the "pooper".*

Dinosaur poop* *Photo by Larry Knoll*

Dinosaur bones in rock *Photo by Larry Knoll*

Stomach stones* *Photo by Larry Knoll*

Dinosaurs continued on page 6……..

**Editor's note: Stomach stones are known as gastroliths (stomach - stone). Like modern birds, some dinosaurs swallowed stones that resided in a gizzard, or went in/out through the intestinal tract with the food. In the former, the stones were occasionally vomited out and replaced. In the latter, the stones were continually replaced. Since the stones worked to pulverize food, gastroliths allowed dinosaurs to swallow sufficient food (since they did not have to chew it up) to fuel large bodies. And as the gizzard stones banged against each other, they became rounded and polished. Definitive identification, of highly polished stones, as gastroliths generally requires intimate association with skeletal remains.*

……..Dinosaurs continued from page 5

Everybody needs a little help now and
Photo by Larry Knoll

Some of the gang *Photo by Larry Knoll*

Before November's meeting, the members participated in a potluck. The club supplied hotdogs and hamburgers, that were lovingly cooked by Marty H. It was a great way to get back in the groove, after the summer break.
Photos by Sue & Stan Celestian

……..Diatomite & Coal continued from page 1

debris -- and hence, the primary component of coal is carbon, with varying quantities of sulfur, hydrogen, nitrogen, and oxygen. The various types of coal are produced through various stages of change. The precursor to the process is *Peat*, which is unconsolidated, boggy, partially decomposed plant material. Burial and pressure will lead to the formation of *Lignite*, a very soft, brown coal, in which plant fragments remain evident. Continued burial/pressure will produce *Sub-bituminous*, and then *Bituminous Coal* (60-80% carbon). The latter is soft, black, and high in bitumen. Ultimately, a higher grade of coal is produced, called Anthracite Coal. However, it is generally considered a metamorphic rock.

Because of its organic origins, coal is referred to as a "fossil fuel". See Figure 1.

FIGURE 1 Bituminous Coal This soft, black coal is abundant in the coal deposits of the world, and is often high in sulfur.
Photo by Stan Celestian

Coal Environment of Deposition: Throughout geologic time, small to extensive low-lying wetlands have formed, such as the coastal swamps that characterize the Pennsylvanian Period. These areas supported persistent plant life for very long periods of time. Plants flourished, died, and were buried. Over time, the water-logged and accumulated plant debris subsided, and was covered by clastic sediments, such as sand, silt, and clay. With subsidence the pile of debris became thicker and thicker, and thus came compaction and an increase in temperature. Additionally, burial protected the deposits from oxygen, and aerobic bacterial decay was severely slowed. Those higher temperatures and pressures "cooked" the plant debris, driving off volatiles (such as methane), and increasing the relative carbon content. In Kentucky, it has been estimated that it took 10 feet of peat to produce 1 foot of bituminous coal. (https://www.uky.edu/KGS/coal/coalform.htm)

Diatomite & Coal continued on page 7……..

……...Diatomite & Coal continued from page 6

Diatomite or Diatomaceous Earth (DE) is an accumulation of fossil diatoms. Diatoms are microscopic (mostly) aquatic algae that produce two overlapping lacy shells (valves) of silica (opal). They generally float, are photosynthetic, and are found in marine water, freshwater, in soil, and damp areas.

Diatoms may be small, but they make up almost of the organic mass found in Earth's oceans. See Figures 2-3.

Diatomite is a soft -- though abrasive -- generally white rock, that can be easily powdered. See Figure 4.

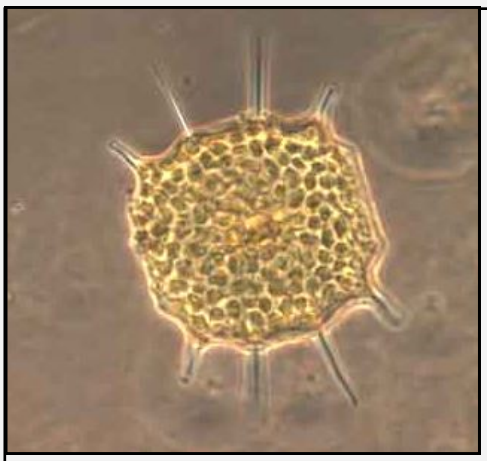


FIGURE 2 Diatom This is a living diatom. Note the lacy skeletal framework, and the radiating pseudopodia (extensions of the organism that facilitate movement and entrap food. *Image courtesy of NOAA PMN, Photo by Dr. Steve Morton*

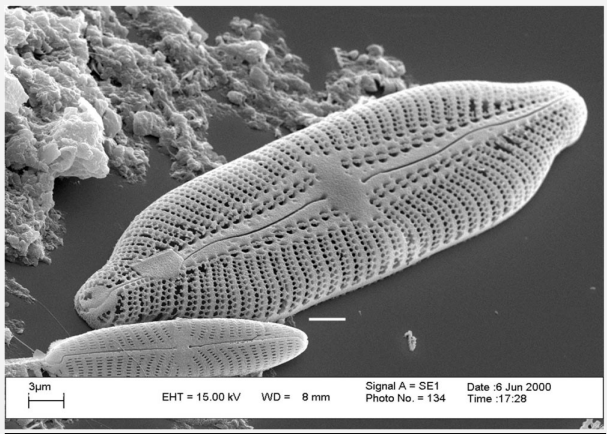


FIGURE 3 Diatom *Aneumastus sp.* This scanning electron micrograph clearly reveals the beautiful shell of this diatom. *Image courtesy of NOAA, Photo by Sarah Spaulding*

Diatomite Environment of Deposition: Diatoms generally live in relatively shallow water (less than 30 feet deep), due to their need for sunlight for photosynthesis. When the chemistry of the water is ideal -- pH, infall of siliceous volcanic ash, influx of the vital nutrient phosphorous, from the weathering of volcanic rocks, diatoms will 'bloom'. As diatoms die, their siliceous framework sinks to the bottom of ocean or lake basins. See Figure 5. There they may accumulate to great thickness. In many basins, there may be a minimum of clastic sediments, and diatoms may compose in excess of 30% (by weight) of the sediment, That sediment is called a *siliceous ooze*. And it is this ooze that will become lithified into a relatively pure deposit of porous silica. *Imagine how many trillions of these creatures must die to form a mineable deposit of diatomaceous earth -- especially when you consider that on the way 'down', many of the shells may dissolve!*

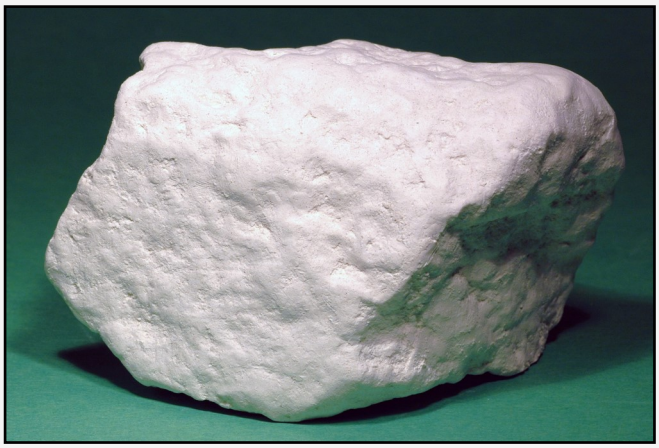


FIGURE 4 Diatomaceous Earth (Diatomite) This soft white chalk-like rock was mined near San Manuel, Arizona. The diatoms were deposited in a Upper Miocene-Pliocene lake environment.
Photo by Stan Celestian

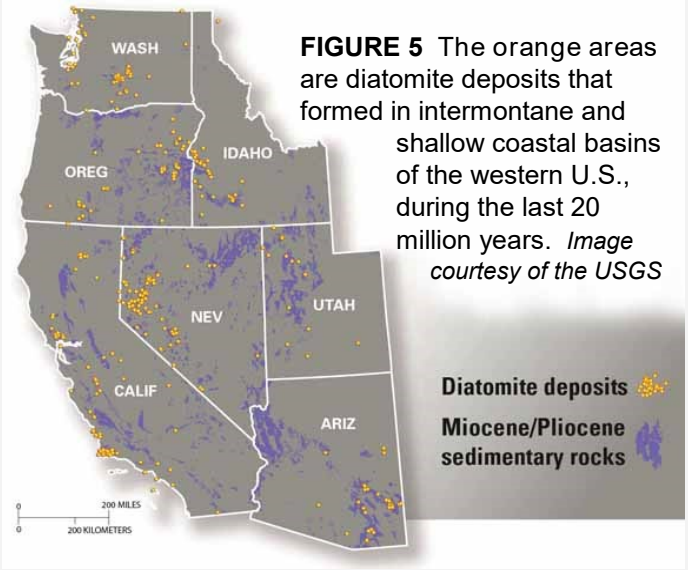


FIGURE 5 The orange areas are diatomite deposits that formed in intermontane and shallow coastal basins of the western U.S., during the last 20 million years. *Image courtesy of the USGS*

UPCOMING AZ MINERAL SHOWS

Monthly - Tempe, AZ Gallery TCR , 906 S Priest, #107; Sat 9-6; Free. For dates, go to: https://www.facebook.com/pg/gallerytcr/events/?ref=page_internal

November 19-20 - Apache Junction, AZ Apache Jct Rock and Gem Club; Skyline High School, 845 S Crimson Rd, Mesa, AZ; Sat 9-5, Sun 10-4; Admission: $3, students $1, children free.

November 19-20 - Payson, AZ Payson Rimstones Rock Club; Payson High School Longhorn Gym, 310 S McLane Rd; Sat 9-5, Sun 10-4; Admission: $2, children free.

November 26-27 - Wickenburg, AZ Wickenburg Gem and Mineral Club; Hassayampa Elementary School, 251 S Tegner St; Sat 9-5, Sun 10-4; Admission: Free.

January 1 - February 29 - Quartzsite, AZ For show schedules http://www.desertusa.com/cities/az/quartzsite.html

January 6-8 - Mesa, AZ Flagg Foundation; Mesa Community College, Dobson, north of US 60; Daily 9-5; free.

January 20-22 - Globe, AZ Gila County Gem and Mineral Society; Gila County Fairgrounds, 900 E Fairgrounds Rd, Globe, AZ 85501; Sat 9-5, Sun 10-4; $3/person, $5/couple, students and children free.

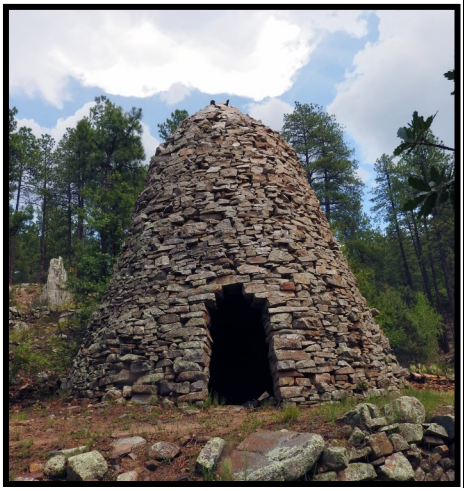
February 9-12 - Tucson, AZ Tucson Gem and Mineral Society; Tucson Convention Center, 260 S Church St; Thurs-Sat 10-6, Sun 10-5; Admission: $13, under 14 free with adult.

March 25-26 - Anthem, AZ Daisy Mountain Rock and Mineral Club; Boulder Creek High School Gym,

If you are travelling, a good source AND clubs is http://www.the-vug.com/vug/vugshows.html or http://www.rockngem.com/ShowDatesFiles/ShowDatesDisplayAll.php?ShowState=AZ For out-of-the-country shows: http://www.mindat.org/shows.php?current=1 A good source for a list of Arizona Mineral Clubs and contact information is http://whitemountain-azrockclub.org/Public_AZ_Clubs_Links.html

Walker Charcoal Kiln, at Walker, AZ. This kiln, built in 1880, created charcoal from oak. The charcoal was used in local smelters. According to the Forest Service, so much wood was cut that the forest "is just now becoming productive again".

Photo by Susan Celestian



UPCOMING WGMS FIELD TRIPS

No trips scheduled at this time.

DATES SUBJECT TO CHANGE

If you all have some place that you would like to go, let Marty H. 602-469-7770 or Craig J. 208-681-4770 know. This is your club. Let's go out and have some fun.

CONSIDER VOLUNTEERING TO PLAN OR HELP PLAN TRIPS. YOU WOULD NOT NEED TO LEAD EVERY TRIP, BUT KEEP THINGS ON TRACK

Dues are due!

http://www.wickenburggms.org/

If you ever have photos from a club field trip, send a couple to Dale, for posting on the website.

Officers and Chairperson

President: Craig Jones.....208-523-9355
Vice President: Martin Hagan..... 602-469-7770
Secretary: Judy Zimmerlee..... 517-652-1355
Treasurer: Debra Keiser..... 928-684-1013
Program Director: Dale Keiser..... 928-684-1013
Publicity: currently open position
Membership: Roma Hagan 602-469-7662
Editor: Susan Celestian 602-361-0739
Field Trip: Craig J, Bob B, Marty H
Show Chair: Beth Myerson.....480-540-2318
Scholarship Chair: Steve Hill..... 928-533-3825
Historian: Jeanine Brown..... 928-684-0489

Meetings are held the **2nd Friday most months** at **Coffinger Park banquet room.** Potluck dessert at 6:30 pm. Business meeting at 7:00 pm. **Exceptions: February and December** meetings are held on the **first Friday of the month.** We do not meet in the summer — **no meetings in June, July or August**.

Membership Dues: $15.00 Adults per Person
$ 5.00 Juniors and Students

Meeting Dates for 2016

Wickenburg: Jan 8, Feb 5, Mar 11, Apr 8, May 13, Sept 9, Oct 14, Nov 11, Dec 2

Stanton meets Thursday after the Wickenburg meetings. Jan 14, Feb 11, Mar 17, Apr 14, May 19, Sept 15, Oct 20, Nov 17, Dec 8 (subject to change)

MINERALS IN OUR EVERYDAY LIVES

USES of DIATOMITE*

♦ Filtering agent: beer, wine, motor oil, swimming pool water, pharmaceuticals

♦ Additive/Filler:

- paint (modifies gloss/sheen, whitener, adds bulk/strength, enhances adhesion….)
- plastics (helps in the consumer separation of plastic bags, & parts during manufacture);
- strengthens dental composite fillings; matches, lacquers, sealants, paper
- makes cement, plaster, stucco & mortar lightweight
- asphalt shingles, rubber, paper

♦ Absorbent: industrial spills, waste remediation

♦ Soil amendment: holds water in soil, loosens hard soil, improves root growth, improves permeability of water and air

♦ Growing medium: hydroponics, bonsai

♦ Insecticide: glassy diatoms scratch insect exoskeleton & absorb waxy coatings -- leading to dehydration and death (This works great -- and no chemicals!)

♦ Seed coatings additive: binds seed to soil, provides leverage for root growth, increase seedling stability

♦ Explosives: absorbs & stabilizes nitroglycerin used in dynamite

♦ Abrasive (mild): metal polish, facial scrub, toothpaste

USES of COAL*

♦ Fuel: original coal, fuels formed through coalification & liquefaction, and refined coal

♦ Coke, used in steel-making and other industrial processes

♦ Activated carbon: filter for water, air, kidney dialysis

♦ Carbon fiber: strong, lightweight material for bike, tennis rackets, golf clubs……

♦ Additive in foundry sand & mold wash (as ground coal heats up it releases reducing gases, preventing liquid metal from penetrating the foundry sand or mold

*Some of the references used regarding diatomite and coal are:

http://www.ima-na.org/?page=what_is_diatomite
http://www.mtsylviadiatomite.com.au/product/diatomite-granular
https://en.wikipedia.org/wiki/Diatomaceous_earth
http://geology.com/rocks/diatomite.shtml
http://docs.azgs.az.gov/OnlineAccessMineFiles/S-Z/WhitecliffsPinal561-2.pdf
https://pubs.usgs.gov/fs/2006/3044/fs-2006-3044.pdf

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