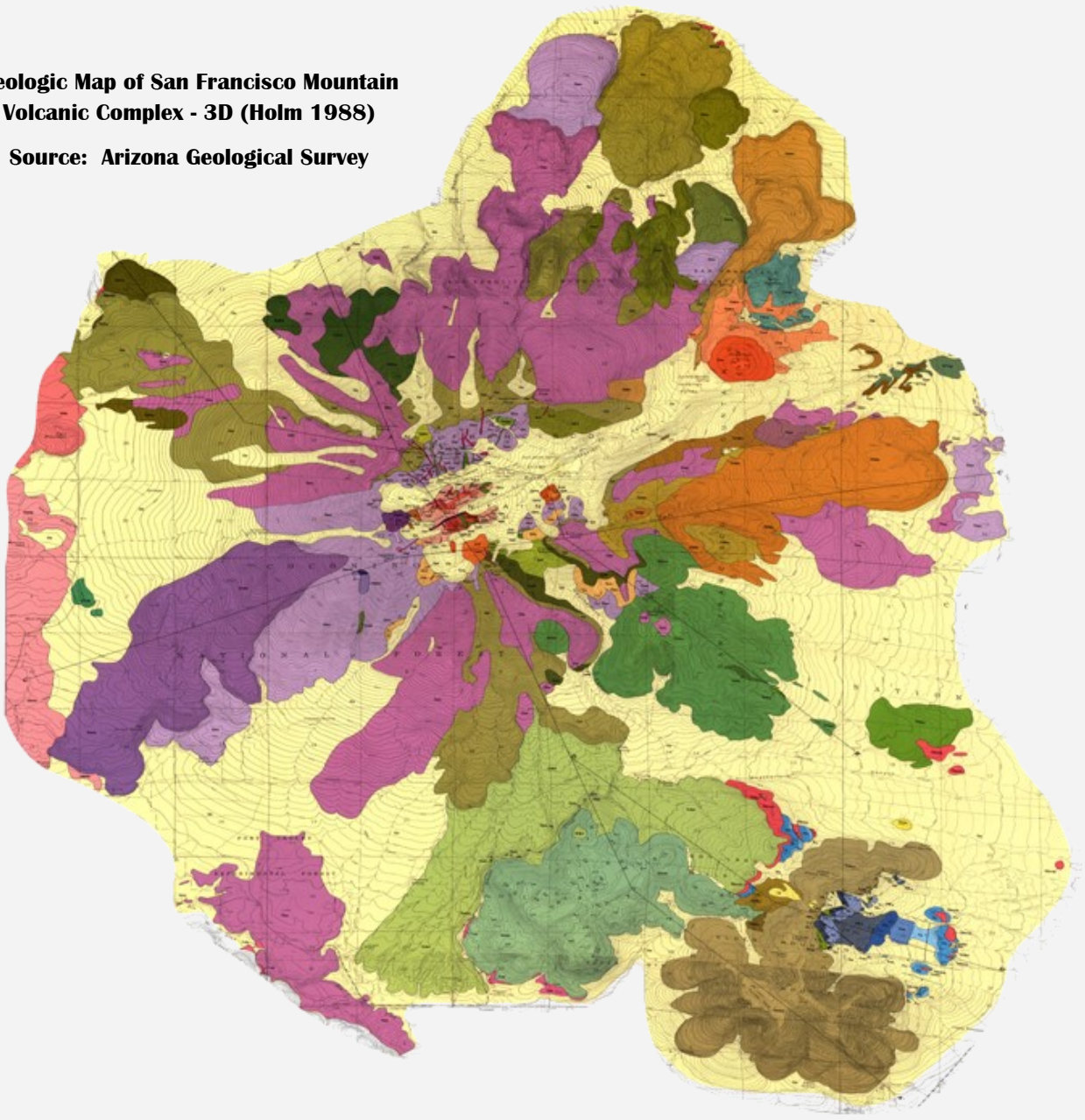
DAISY MOUNTAIN ROCKCHIPS

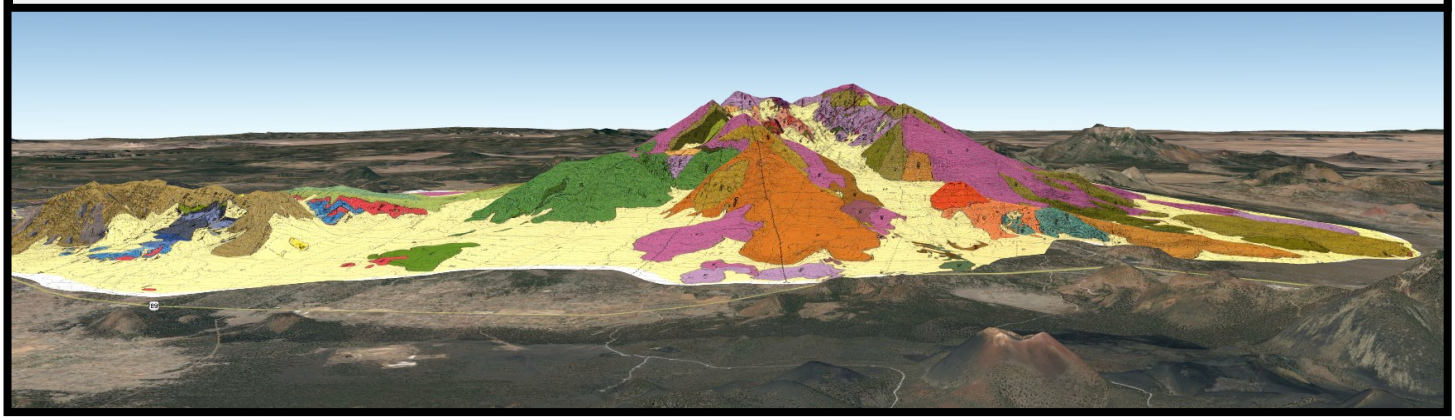
The purpose of Daisy Mountain Rock & Mineral Club is to promote and further an interest in geology, mineralogy, and lapidary arts, through education, field experiences, public service, and friendship.

VOLUME 6, ISSUE 1 **JANUARY 2021**

Geologic Map of San Francisco Mountain Volcanic Complex - 3D (Holm 1988)

Source: Arizona Geological Survey





FOSSILS: PART XIV

Kingdom: Animalia
Phylum: Arthropoda,
Sub-Phylum - Crustacea

By Susan Celestian

Crustacea includes lobsters, crabs, shrimp, brine shrimp, barnacles, ostracods, crayfish, and numerous others. They aren't super common as fossils, but they are dominant animals in today's aquatic environments -- and they sure are tasty! Plus, some (such as krill and copepods) are major players near the bottom of the food chain, where they feed on plankton, and serve to move those nutrients up the chain. Krill are an immensely important as a food source for whales, seals, and even penguins. And they constitute a large part of the overall biomass in the ocean. For example, the Antarctic Krill comprise 500 million tons of biomass -- which is twice the biomass of humans.[1]

General crustacean characteristics are as follows:

- The geologic record of the group extends from the Middle Cambrian (508 mya) to Recent.
  - Crabs appear in the Jurassic (174-201mya), the oldest shrimp may be 360 myo, while true lobsters first are seen in the Cretaceous (120 mya).
- One important feature common among all crustaceans is their unique initial larval stage -- the nauplius (Figure 1).

FIGURE 1 NAUPLIUS LEFT: a shrimp larva, and RIGHT: a copepod larva -- a stage unique among all crustaceans. Left image courtesy of NOAA, Public Domain; Right image courtesy of Dr. Ralf Wagner, CC by 3.0 Public Domain.

[1] *https://www.ck12.org/biology/crustaceans/lesson/crustaceans-advanced-bio-adv/*

Crustacea continued on page 7.

VOLCANICS OF NORTHERN ARIZONA

PART I: San Francisco Peaks - Stratovolcano

By Susan Celestian

In anticipation of a club field trip to visit volcanoes of Northern Arizona, around Flagstaff, I am starting a series visiting some of the more interesting and accessible features.

Covering about 1800 square miles, the San Francisco Peaks Volcanic Field is home to one large stratovolcano, several lava domes, and about 600 cinder cones. *See Figure 1'*.

Activity in the volcanic field began about 6 million years ago (mya), in the western end of the field, and continued progressively east, with the last eruption being Sunset Crater less than 1000 years ago.

And why is there so much volcanic activity so far away from any present or past tectonic plates. Many geologists think it is because there lie, beneath Northern Arizona, a stationary "hot spot", across which the North American plate moves, west to east.

There is the potential for future eruptions in the eastern end of the field. Wouldn't that be cool!!

Volcanics continued on page 11...

ZOOM MEETING
FEBRUARY 2, 2021

BE SURE TO ATTEND

Our speaker will be Evan Jones, local collector/ dealer. He will speak about wulfenite, and the effort to make it the State Mineral.

"WULFENITE -- THE OFFICIAL STATE MINERAL OF ARIZONA"

INSIDE THIS ISSUE

Each item is now hyperlinked to the page on which it is found

RUTILE

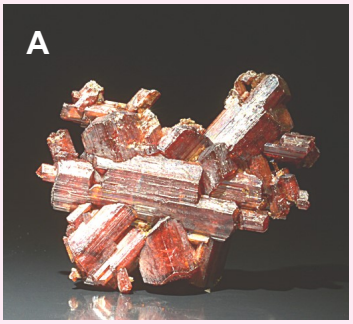
By Susan Celestian

The name Rutile derives from Latin *rutilus*, for "reddish". It is a member of the Rutile group, which also includes minerals familiar to you -- pyrolusite and cassiterite, plus 6 others. With the addition of various amounts of other elements, such as tantalum, iron, antimony, niobium, nickel, vanadium, several varieties of rutile form.

Chemical Formula - *TiO_2*
Crystal System - *Tetragonal (3 axes at 90° to each other; 2 of equal length, and one longer or shorter). Go here and/or here, scroll way down to interactive graphics.*
Growth Forms/Habits - *Slender prisms, acicular, granular, massive*
Hardness - *6-6.5*
Luster - *Adamantine, Metallic*
Streak - *gray-black, pale brown, light yellow*
Colors - *Blood red, brownish-red, yellow, brown-yellow, greyish, black, bluish, violet, rarely green*
Diaphaneity - *Transparent*
Specific Gravity - *4.23*
Cleavage - *1 very good, 1 good, 1 poor*
Fracture - *uneven, conchoidal-subconchoidal*
Occurrence - *Accessory mineral in granite and other igneous rocks, pegmatite, skarn, gneiss, and schist. It is often concentrated in "heavy sands", making it mineable.*
Other - *Twinning common: often elbow twins; various contact twins; sixlings, eightlings.*
Uses - *Titanium ore, used in pigments, acts as inert coat on welding rods*

Rutile can be crystals of a very pretty vibrant rosy red, with an almost metallic luster, and it is often reticulated (crystals arranged in a geometric lattice). *See Figures A-C.*

FIGURE A RUTILE CRYSTAL This single crystal, from Graves Mountain, Georgia exhibits the metallic luster seen in rutile -- a non-metallic mineral. *Photo by Stan Celestian; photo used with permission of Natural History Museum of Los Angeles County*



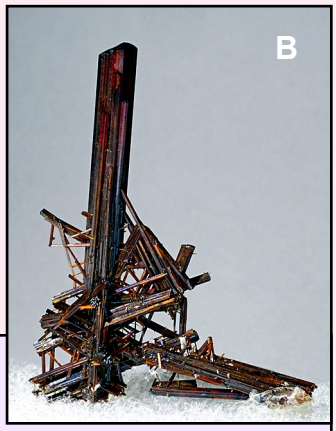


FIGURE B RUTILE -- RETICULATED CRYSTAL These two crystal groups are reticulated. A - From Diamantina, Minas Gerais, Brazil; B - From Alexander County, North Carolina *Photos by Stan Celestian*

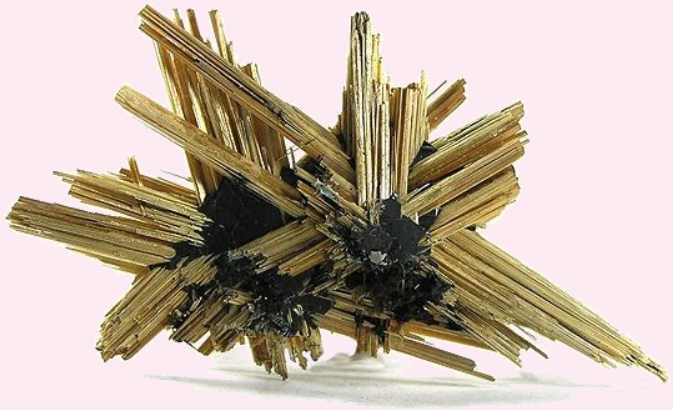


FIGURE C RUTILE & HEMATITE Classic specimens from Novo Horizonte, Bahia, Brazil put rutile and hematite together. The golden needles of rutile extend perpendicularly off the 6 rhombohedral faces of the hematite, producing a 6-rayed "star". *Photo by Rob Lavinsky, iRocks.com – CC-BY-SA-3.0, CC BY-SA 3.0, Wikipedia Commons*

Rutile continued on page 14..

Zoom Board Meeting Minutes

No Board Meeting Available

General Meeting Minutes
January 5, 2021

- Bill F. called the meeting to order
  - ◊ Meetings in the future will depend on COVID-19 restrictions
  - ◊ February will be another zoom meeting
- The guest speaker, Dr. Peter Megaw did a very thorough and insightful comparison of the rock and gem shows around the world
  - ◊ They are in Munich, Germany, St. Marie, France, and Hunan, China if anyone would like to visit different global gem shows
  - ◊ Tucson has the most vendors, so go check it out
- Cynthia B. discussed the financials
  - ◊ Check was given to Rocky Mountain Federation for our insurance
  - ◊ We are still in good standing despite the setbacks this year
- Stan C. updated us on the claim's status
  - ◊ Modifications for slope work is in the process with BLM
    - Measurements will be taken this week (week ending 1/9)
    - Kyle from BLM okayed the signs at the claim
  - ◊ The club would like to purchase another claim
    - One option is the Mushroom Rhyolite we will go to soon
- Bill F. discussed the field trips
  - ◊ Prism/ Blue Cube mine was very successful
  - ◊ Look for emails with details of every upcoming trip
    - Please respond to email if you would like to attend
      - * Include name, # of attendants, and phone number
- Ed W. discussed the show
  - ◊ He is looking into the outlet malls as a location
    - Would be a fall date if possible
- Tiffany P. talked about the club dues
  - ◊ ~90 members renewed
  - ◊ 70 or so that did not renew will get a final notice this month
    - If you haven't paid your dues, you will be dropped from the emailing list
- Claudia M. still has t-shirts available from those that requested them
  - ◊ Please email her to pick them up Claudia Marek@gmail.com
- Inventory of our trailer went successfully
  - ◊ Some large items are for sale
  - ◊ Everything else is for the show
- Wire wrapping class was cancelled for January
  - ◊ Jennifer G. may have a February meeting
    - Depends on COVID-19
    - May see if zoom meeting has interest
- Please wear your nametag to all club events
  - ◊ If you still need yours that was recently ordered, please be patient
    - We are having issues with the vendor
    - Email Bill F. at bfreese77@cox.net and he will try to get you one
- North Mountain Visitor's Center is open again
  - ◊ Lapidary access only – no classes
    - 4 people at a time
    - Schedule in advance with center
    - Must wear a mask inside
  - ◊ You can see the center's schedule on the newsletter
- Facebook, email, website, and newsletters are all up to date and can be useful resources to find what you need to know about the club

Respectfully submitted, Rebecca Slosarik, secretary

DECEMBER SPEAKER - DR. PETER McGAW

Peter McGaw (Show Chair of the Tucson Gem & Mineral Show) presented a very interesting PowerPoint comparing the 4 main international gem and mineral shows: Tucson, China, France (Sainte Marie-aux-Mines), and Munich.

- ► China is new to the mineral show scene, but attendance is phenomenal -- thousands of attendees stand shoulder to shoulder in the venue -- crowded!.
  - ♦ Claim to fame -- emphasis on VERY large specimens
- ► Sainte Marie is a fairly small, European village, and the show primarily takes place along the narrow streets, where dealers set up booths under canopies, plus a couple indoor venues.
- ► Munich hosts a more traditional indoor show, similar to Tucson, with high-end dealers creating expansive and up-scale booths.
- ► And the Tucson Show has exploded to include many satellite shows throughout Tucson during the months of January/February.
  - ♦ In addition, the Tucson Show is the only one that highlights exhibits by collectors and museums.

TRIP TO THE BURRO CREEK

Saturday, January 9, 2021

Photos by Bill Freese & Susan Celestian

For decades, Burro Creek has been a favorite destination for rockhounds. The ground is literally covered with chalcedony, and if you wander enough and turn over enough rocks, you can find some lapidary treasures! Fourteen DMRMC members descended into the canyon on this field trip.

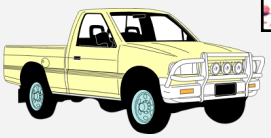
Who spotted the crested saguaro, on the way down?

Field Trips continued on page 6….

...Field Trips continued from page 5

Michael Speciale is on Top of the World!
Photo by Joann Speciale

Look at the ballast in that trunk!



I dub thee Bacon Jasper

Cynthia found a very botryoidal mass of quartz!

We often see burros, but today only many, many footprints.

….Crustacea continued from page 2

- ► Crustacean bodies are segmented -- into cephalothorax and abdomen. There will be 8-10 walking/swimming legs. Additional appendages will be adapted as pincers, filters, and other functions.
- ► All crustaceans have two pairs of antennae during some point in their life cycle.
- ► However, among the 35,000-67,000 (depending on the source) species, there is a very wide variety in body style. And, according to *Wikipedia*, that may be but 1/10 to 1/100 of the total, including those yet to be discovered.
- ► Most crustaceans have compound eyes, at least during the larval stage.
  - Crabs have two stalked compound eyes that can move independently of each other. They can detect UV light at depths of 1/2 mile, where light is VERY scarce. Additionally, crabs have simple light sensitive "eyes" scattered around the body.
  - Like crabs, lobsters have stalked compound eyes, each with up to 10,000 lenses. The lenses are actually square tubes that reflect light to a focal point. They have a 180° field of view, but detect only motion -- no images.
  - Shrimp have stalked, independently moving compound eyes. In fact, Mantis Shrimp have, within their eyes, photoreceptors that can detect plain, UV, multiple directions of polarized light -- including color (16 color receptors, compared to our 3).
  - Brine Shrimp adults have two flexibly stalked compound eyes.
  - Barnacles have 3 photoreceptors, that distinguish light and dark. Changes in light may trigger their "shadow reflex" and cause them to retract into their shell.
  - Ostracods primarily respond to their environment via touch-sensitive hairs. They do also have a single photoreceptive "eye". Some do have compound eyes.

Crustacean habitat:

- ► Most are mobile aquatic (marine or fresh water) animals.
- ► Barnacles are sessile (permanently attached to the substrate).
- ► A few are terrestrial (such as woodlice or pillbugs, which we are not taking into consideration in this article), and some crabs, such as the coconut crab.

Crustacean habit:

- Feeding habits: among the species there are predators, scavengers, filter feeders, and parasites.
- Mobility: As previously mentioned, nearly all crustaceans are mobile, either walking on their legs, or swimming. A few -- like barnacles -- are attached, and remain in one spot throughout their lives.
- Reproduction:
  - ◊ Most crustaceans have separate sexes
  - ◊ Within many species, females may produce eggs without benefit of any male contribution.
  - ◊ A few are hermaphroditic -- capable of producing both male and female gametes, and capable of self-fertilization.
  - ◊ Eggs may be released into the water, may be attached to some surface, or carried until hatching (generally by the female).
- Respiration: The smallest crustaceans "breath" by exchanging gases through their shells; while the larger species have gills (even the land-dwelling species have gills, specialized to remain moist).

Crustacea continued on page 8….

….Crustacea continued from page 7

► Interesting facts:

- The world's largest arthropod -- a crustacean -- is the Japanese Spider Crab, whose legs span 12.5 feet! The smallest is a mere .0004 inches long (*Stygotantulus stocki*)
- In 2018, 9.4 million tons of crustaceans were consumed by people.[2]
- Uniquely, Hermit Crabs are unable to create their own shells, and usually occupy empty snail shells. Stan and I have watched a Hermit Crab trying out various shells, until it found the perfect fit.
- To move rapidly, lobsters tuck in their tail and walk backwards. Crabs usually move sideways, when in a hurry.
- Some species have been discovered living in deep ocean trenches, at depths of almost 33,000 feet!
- And crustaceans can be found occupying alpine lakes at over 16,000 feet above sea level.
- Atlantic Krill live 5-10 years. A lobster can live 100 years.
- The study of crustaceans is called *carcinology*. Be sure to stick that term in you vocabulary quiver.
- An individual North Atlantic Lobster can exceed a weight of 40 pounds -- YUM!
- Soft-shelled crab -- a seasonal delicacy -- is a newly molted crab, whose new shell has not yet hardened.
- The term for a group of crabs is "cast".
- In colonial America, pigs, goats, prisoners and servants were often served the plentiful lobster. In fact, some Massachusetts servants got so tired of lobster, they had a judge decree that they could not be served lobster more than 2-3 times a week.[3] My how times have changed!

[2] *The State of the World Fisheries and Aquaculture by Food and Agriculture Organization of the United Nations 2020, page 6.*

[3] *https://www.mentalfloss.com/article/28507/9-essential-facts-crustacean-enthusiast*

Images of crustacean fossils follow, in Figures 2-10.

FIGURE 2 SHRIMP Two detailed fossils of *Carpopenaeus callirostri*, out of the Cretaceous Cenomanian Fm., Hjoula, (Hakel), Lebanon. Specimen is 2.8" wide (each shrimp is about 1.5" long, with tail tucked. *Photo by Stan Celestian*

FIGURE 3 SHRIMP This shrimp has very long antennae. Jurassic Solnhofen Limestone of Germany. Shrimp is 9" long.
Photo by Stan Celestian

Crustacea continued on page 9 ….

….Crustacea continued from page 8

FIGURE 4 SHRIMP This big prawn is *Aeger tipularius,* out of the Jurassic Solnhofen Limestone of Eichstatt, Germany. The fossil is 4.8” long. *Photo by Stan Celestian*

FIGURE 5 LOBSTER This specimen is a primitive lobster. It was preserved lying on its back, with its legs splayed, and abdomen folded up. This is from the Jurassic Solnhofen Limestone of Eichstatt Germany. Specimen is 5” long from the tip of the antenna to the end of the tail. .*Photo by Stan Celestian*

FIGURE 6 TINY LOBSTER With its claws stretched out, *Eryma minuta* is from the Jurassic Solnhofen Limestone of Eichstatt, Germany. Specimen is 2.9” from the tip of the tail to the tip of the claws.. *Photo by Stan Celestian*

FIGURE 7 MUD LOBSTERT *Thalassina* from Australia. This is probably from the Late Pleistocene (2mya). Specimen is 4” long. *Photo by Stan Celestian*

FIGURE 8 LOBSTER *Mecochirus longimanu* (Jurassic Solnhofen Limestone, Eichstatt, Germany) has a freakishly long pair of walking legs. Specimen is 7.5” from pincer to tail. *Photo by Stan Celestian*

FIGURE 9 *Eryon cuvieri* is related to crabs and lobsters. This fossil is out of the Jurassic Solnhofen Limestone, of Germany. This specimen is 3” long. *Photo by Stan Celestian*

Crustacea continued on page 10….

….Crustacea continued from page 9

FIGURE 10 **CRAB** *Lobocarcinus paulino-wurtemburgensis* from Eocene-age Moquattam Beds, Cairo, Egypt.. Specimen is 5" wide. *Photo by Stan Celestian*

FIGURE 11 CRAB Haqel, Lebanon. Late Cretaceous age (98 mya) Specimen is 2.8" wide. *Photo by Stan Celestian*

FIGURE 12 OSTRACOD This is a microscopic view of a living ostracod. Photo By Anna33 at English Wikipedia, CC BY 2.5, Wikipedia Commons

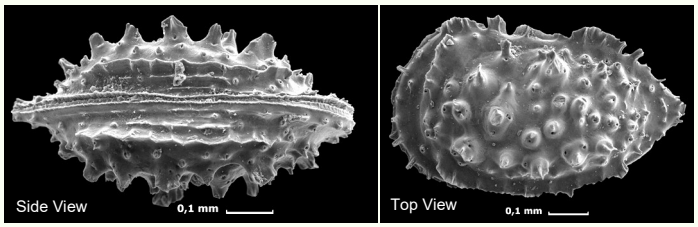


FIGURE 12 OSTRACOD This is a rather ornate Jurassic ostracod - *Lophocythere karpinskyi*. Ostracods are far and away the most common arthropod fossils (*Wikipedia*). They are very useful for identifying rocks deposited during the same time period (biozonation), and for interpreting paleoenvironment. Their small size is good for assuring their presence in drill cores, which aids in the interpretation of deeply buried rocks

Ostracods are arthropods housed within a bi-valved shell, composed of chitin or calcite. Most typically they live on the bottom of an ocean or lake (even ephemeral water bodies), although some have been found in moist forest soils and caves.

Photo by Shyrypkina - Own work, CC BY 4.0, Wikipedia Commons (side view & top view)

For more images of ostracods, go to Illinois Geological Survey or IOPD (Internat'l Ocean Discovery Program (and scroll through several pages of images).

GENERAL RESOURCES FOR CRUSTACEA

https://www.ck12.org/biology/crustaceans/lesson/crustaceans-advanced-bio-adv/
https://en.wikipedia.org/wiki/Crustacean
https://easysciencefforkids.com/all-about-crustaceans/
http://justfunfacts.com/interesting-facts-about-crustaceans/
https://kids.kiddle.co/Crustacea
https://www.mentalfloss.com/article/28507/9-essential-facts-crustacean-enthusiast

https://lobsteranywhere.com/seafood-savvy/how-lobsters-see/
https://en.wikipedia.org/wiki/Lobster
https://ucmp.berkeley.edu/arthropoda/crustacea/crustaceamorpha.html
https://www.reuters.com/article/us-mexico-lobster/mexico-finds-worlds-oldest-lobster-fossil-idUSN0242811320070503
https://theculturetrip.com/north-america/usa/maine/articles/story-maine-lobster-prison-food-delicacy/

https://www.huffpost.com/entry/oldest-crabs-found-spider-species-fossil-reef_n_2616463
https://en.wikipedia.org/wiki/Eocarcinus
https://www.factretriever.com/crab-facts

https://en.wikipedia.org/wiki/Shrimp
https://www.sciencedaily.com/releases/2010/11/101109172349.htm
https://www.theatlantic.com/science/archive/2018/04/mantis-shrimp-eye-camera/557195/

https://en.wikipedia.org/wiki/Brine_shrimp
https://en.wikipedia.org/wiki/Barnacle

https://www.st.nmfs.noaa.gov/nauplius/media/copepedia/taxa/T4000009/html/photoframe.html

https://en.wikipedia.org/wiki/Ostracod#:~:text=Ostracods%20are%20%22by%20far%20the,early%20Ordovician%20to%20the%20present.

...Volcanics continued from page 2

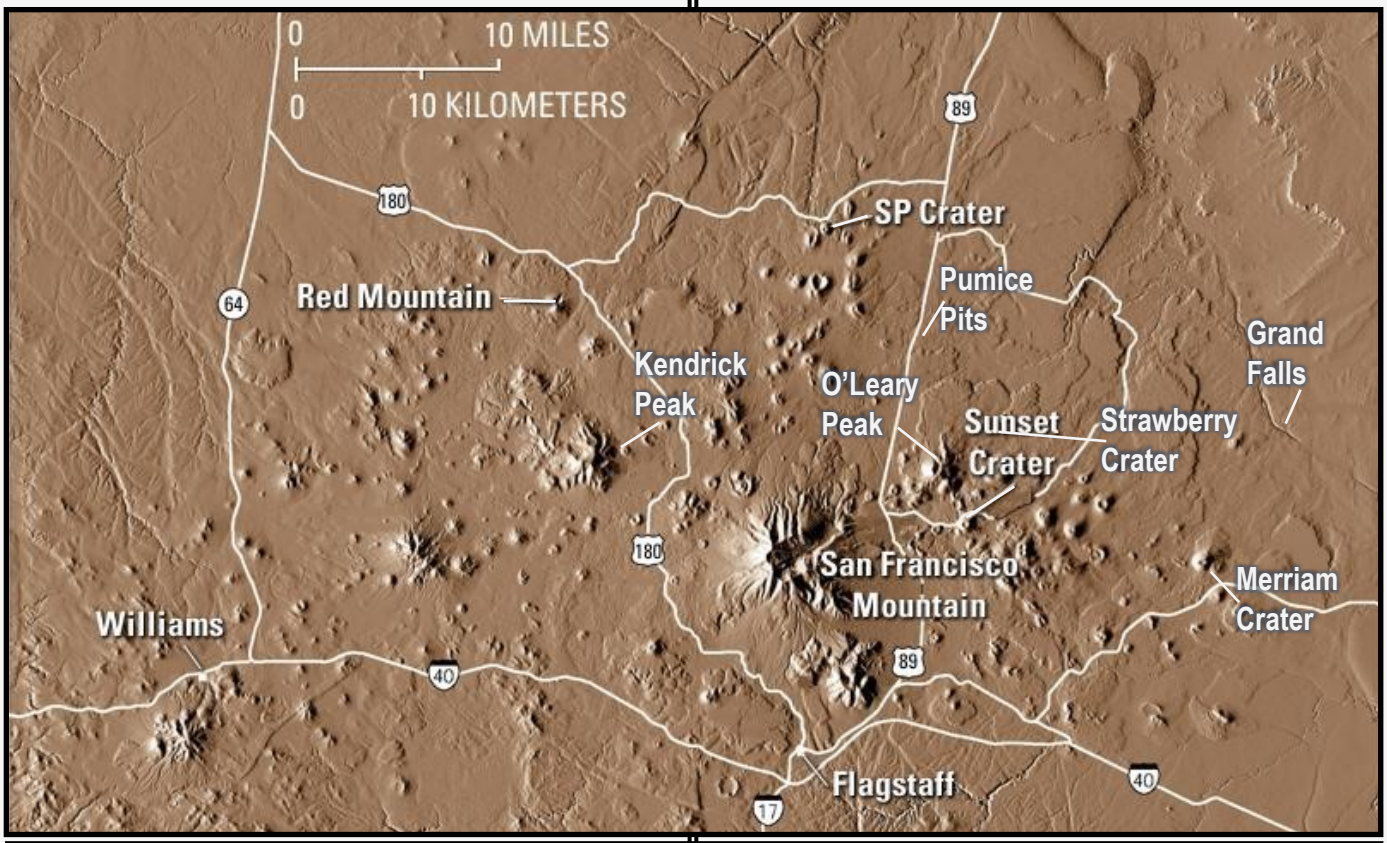


FIGURE 1' SAN FRANCISCO VOLCANIC FIELD This is a digital elevation model (DEM) of the San Francisco Volcanic Field, near Flagstaff, Arizona. Within the field are the stratovolcano (San Francisco Mountain), at least 3 domes (Kendrick Peak, Mt. Eldon, Mt. O'Leary), and at least 600 cinder cones.
Image courtesy of the USGS (some sites added by S. Celestian)

BACK TO PAGE 2

The San Francisco Volcanic Field is a study in contrasts. There are three types of volcanoes: stratovolcanoes, lava domes, and cinder cones. These include lavas with compositions across the igneous spectrum, from high to low-silica, viscous to fluid, light-colored to dark: rhyolite, andesite, and basalt.

Stratovolcanoes or Composite Volcanoes are steep-sided mountains, formed by the accumulation of alternating layers of viscous (thick, sticky, slow or no flowing lavas) andesite lava, tephra (ash, cinders, pumice), and mudflow or lahar deposits. The lavas tend to accumulate fairly near to the vent, resulting in that steep, classic, cone-shaped mountain. Well-known examples include Mt. Fuji, Mt. Rainier, Mt. St. Helens, Mt. Shasta, Mt. Pinatubo, Krakatoa, & Mt. Etna. *See Figure 2'*.

Volcanics continued on page 12...

FIGURE 2' MT RAINIER This majestic and iconic mountain, piercing the sky of Washington state, is a stratovolcano. The steep-sided cone-shaped mountain is built of layers of viscous lava and volcanic tephra. *Photo by Stan Celestian*

...Volcanics continued from page 11

Lava Domes are bulbous upwellings of dacite (intermediate to rhyolite & andesite) and rhyolite lavas -- lavas so viscous that it really does not flow. Often lava domes act as plugs that prevent the escape of volcanic gases, leading to a build-up of pressure, resulting in an explosive eruption. *See Figures 3' and 4'.*

FIGURE 3' MT ST HELENS This is a look into the crater of a mountain that exploded. After the explosion, in 1980, a lava dome began to build. The dome has expanded and contracted many times, once part of it reaching a height just under 8000', and growing 6' a day. For a USGS video of one dome-building episode, go here. *Photo by Stan Celestian*

FIGURE 4' MT ST HELENS STEREOPAIR Here is another opportunity for you to practice your 3-D vision (you know you want to!). Stare at the two images (line your nose up with the space between), until the images start to cross. Focus on the central image, and they'll pop into a single 3-D image. *Photos by Stan Celestian*

Cinder Cones are small, fairly steep-sided, cone-shaped hills that form during a gassy volcanic phase. Basaltic lava fountains out as blobs of lava, that cool and fall near the vent, as cinders and bombs. The cones rarely exceed 1000' tall. As the pressures are reduced, there may issue an associated fluid river of lava (basaltic lava has very low viscosity). A good example of a cinder cone is illustrated in *Figure 5'*.

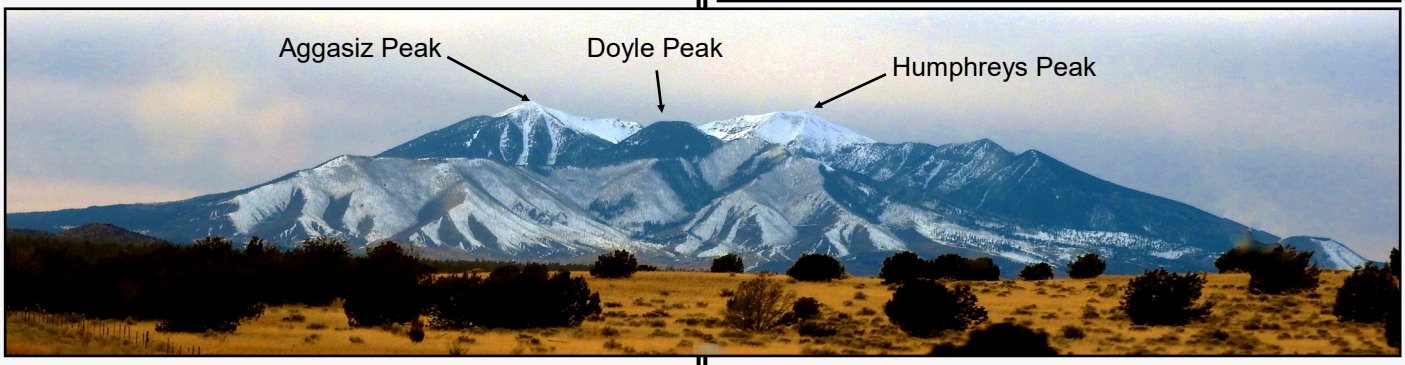
Volcanics continued on page 13...

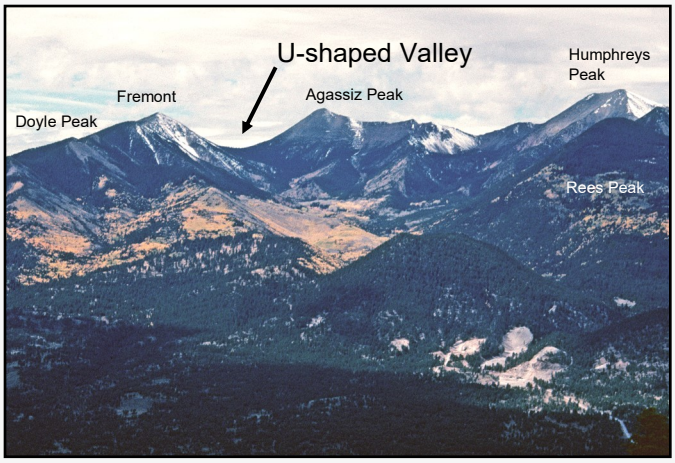
FIGURE 5' RODEN CRATER This cinder cone lies about 50 miles northeast of Flagstaff, in the far eastern part of the San Francisco Volcanic Field. The lava flow in the foreground flowed to the northeast. Note: In the center lies an observatory being built by James Turrell, a light and space artist. Begun in 1979, it may open to the public by 2024. *Photo by Dale Nations, AZGS Arizona's Earth Science Photo Gallery*

...Volcanics continued from page 12

SAN FRANCISCO MOUNTAIN or "The Peaks" dominates the whole scenery in the volcanic field, with a maximum elevation of 12,633 feet, Mt. Humphreys. It is a *stratovolcano,* and was active between 1 mya and 0.1 mya. *See Figures 6' - 8'.*

FIGURE 6' SAN FRANCISCO MOUNTAIN This view, from the south southeast, illustrates the prominent topographic expression of this stratovolcano. The highest peak on the right is Humphreys Peak. *Photo by Susan Celestian*





FIGURES 7' & 8' INNER BASIN These views (from the south/southeast) into the inner basin of San Francisco Mountain, reveal some interesting features. The basin was created when, about 0.9 mya, the east flank collapsed. A massive debris avalanche rushed to the east. The dashed line is an approximation of the pre-collapse summit -- some 4000' higher than the present elevation.

Towering over the inner basin are Fremont, Agassiz, Humphreys, Doyle and Rees Peaks.

During the Pleistocene, the inner basin hosted about 7 glaciers. These tongues of ice and snow gouged out cirques and U-shaped valleys, and left behind moraine (piles of unsorted rock/silt debris) and outwash deposits (sorted stream deposits). The ice was probably about 328-656 feet thick (100-200 meters).

Photos by Stan Celestian

FREE FREE FREE FREE FREE FREE

There are all kinds of free publications that cover the nation's geology. Most of us live in Arizona, but frequent our neighbors, California and New Mexico.

- The Arizona Geological Survey publishes a free newsletter 4 times a year. Until 1988 it, was called *Fieldnotes*, but has since been called *Arizona Geology*. Go to the AGS website to download issues, back to 1971.
- AGS also publishes the more in-depth and downloadable *Down to Earth* series, many focused on a park or geologic feature.
- *New Mexico Earth Matters* is a free digital/paper semi-annual publication, focused on the geology of New Mexico. Go to New Mexico Bureau of Geology and Mineral Resources website to subscribe or download current and back issues.
- California Geology is no longer published, but issues from 1948-2001 are available for free download.

...Rutile continued from page 3

However, we are perhaps most familiar with it as an inclusion in other minerals.

- Rutilated quartz is a favorite. Often golden strands of rutile are scattered, like pick up sticks, within a clear quartz crystal. When the rutile crystals are oriented, you may get a *asterism,* or a *cat's eye* effect. See Figures D-E.

FIGURE D RUTILATED QUARTZ Randomly oriented, golden acicular crystals of rutile decorate this quartz crystal, from Brazil. *Photo by Stan Celestian; photo used with permission of Natural story Museum of Los Angeles County*

FIGURE E RUTILATED QUARTZ In this Brazilian quartz crystal, the rutile crystals are aligned along the three horizontal axes of the quartz. When cut and polished it would exhibit a star or asterism. *Photo by Stan Celestian; photo used with permission of Natural History Museum of Los Angeles County*

- Star Sapphires, Rubies, and Chrysoberyl are also the result of oriented rutile inclusions. See Figures F-G.

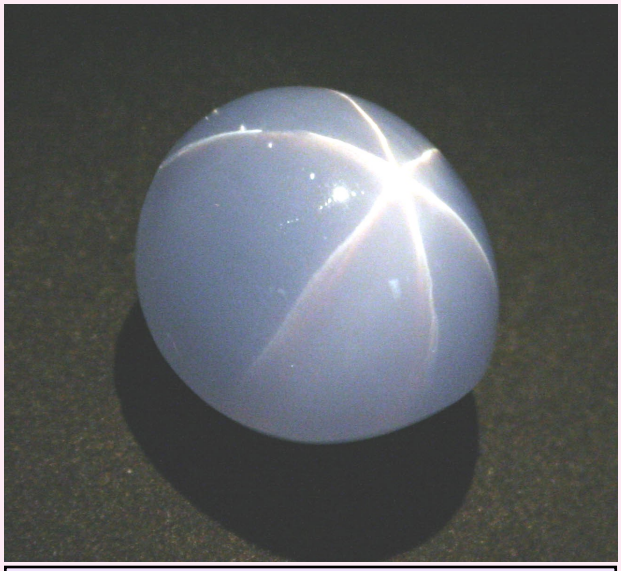


FIGURE C STAR SAPPHIRE Sapphires (blue corundum) are hexagonal, and when rutile crystals align parallel to the 3 horizontal axes, a star or asterism will display on a polished stone. This is the Star of India from the Museum of Natural History in New York City. *Photo by Mitchell Gore, Public Domain, Wikipedia Commons*

FIGURE D CAT'S EYE CHRYSOBERYL In this chrysoberyl, Rutile crystals, oriented parallel to the C-axis, results in a cat's eye effect, when the gemstone is polished. *Photo by Gemshare at the English Wikipedia, CC BY-SA 3.0 (Wikipedia Commons)*

UPCOMING FIELD TRIPS & MEETINGS

WHERE: Brenda area
WHEN: Saturday, February 13, 2021
WHAT: Jasper

WHERE: Chilito Mine?
WHEN: Saturday, February 27, 2021
WHAT: Chrysocolla & other copper minerals

WHERE: Safford/Black Hills Rockhound Area
WHEN: Fri-Sun, February 26-28, 2021
WHAT: Desert Roses & Fire Agate

WHERE: Harquahala Mine
WHEN: Saturday, March 13, 2021
WHAT: Misc Minerals

WHERE: Bullard Mine
WHEN: Saturday, March 20, 2021
WHAT: Copper Minerals, Slag

WHERE: Camp Verde
WHEN: Saturday, March 27, 2021
WHAT: Glauberite Pseudomorphs

WHERE: Date Creek
WHEN: Saturday, April 10, 2021
WHAT: Quartz Crystals, Hematite ps Pyrite

WHERE: Dobell Ranch & Grand Falls
WHEN: Saturday, April 17, 2021
WHAT: Petrified Wood

WHERE: Sycamore Creek
WHEN: Saturday, April 24, 2021
WHAT: Red Jasper

WHERE: Christopher Creek area & Fossil Site
WHEN: Saturday, May 15, 2021
WHAT: Zebra Chert, Naco Fm. Fossils

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

WIRE WRAPPING

Watch for an email announcing the resumption of the wire wrapping group

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. It is set up so you can post photos of outings or related items. Share with friends!

AWARD-WINNING WEBSITE

http://www.dmrmc.com/

If you have comments, contact Nancy Gallagher.

INSTAGRAM

Follow the club on Instagram. Go to https://www.instagram.com/daisymountainrockclub/ and follow today. Share with friends!

Officers, Chairpersons, & Trustees

President: Ed Winbourne…..ewinbourne@gmail.com
Vice President: Bill Freese…… bfreese77@cox.net
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Clark L	Bob S.

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 2021

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

MEETING VIA ZOOM ON TUESDAY, FEBRUARY 2. Look for an email with the link.

Words of Wisdom

passed along by our own

Bob Evans

UPCOMING AZ MINERAL SHOWS

January 29-31 - Cottonwood, AZ Not a show, but a sale - liquidation of collection of June and Harold Doty; 1368 Saddleback Drive; 9-4 daily (NO EARLYBIRDS); 928-481-9193. (Slabs, dino bone, obsidian, tiger eye, agate, equipment, rocks by the bucket and more)

January -February - Quartzsite

Tyson Wells - January 15-February 7; 9-5 daily; check for updates on Facebook or at https://www.tysonwells.com/ (Some rock dealers stick around thru February, even when the "Rock & Gem Show" is over.)

Desert Gardens - January 1-February 28; 9-5 daily; check for updates on Facebook

Pow Wow - January 20-24; check for updates on Facebook or at http://www.qiaarizona.org/POWWOW-Show.html

February 13-16 - Tucson, AZ Tucson Gem & Mineral Society; Tucson Convention Center, 260 S Church St; Admission Fee. CANCELLED

Satellit shows are being rescheduled for April. Click here to check on your show of choice.

March 13 - Coolidge, AZ Pinal Gem & Mineral Show; Pinal Geology & Mineral Museum, 351 N Arizona Blvd; Sat 9-2; Admission - 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

NEEDED: QUALITY MINERALS (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

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.

NORTH MT OPEN STUDIO - FEBRUARY

You are invited to return to NMVC Open Studio. Lapidary & Silversmithing on Thursdays and the first, third and fifth Saturdays in January from 8:30 to noon with cleanup starting at 11:45.

NMVC requires that everyone wear a mask while in the building. (Other NMVC requirements will be sent in a later email or on premises.)

Only four people can sign up, and must do so for the full three hours that the shop will be open each day. First come, first served.

Please arrive no later than 8:45 a.m. The center may close to the public at 10.

Email your request for the day(s) you are interested in participating ASAP. Email Shirley Cote at crystalc17@gmail.com

February – Thursday's dates are 7, 14, 21, 28
February – Saturday's dates are 2, 16, 30

If more than four people wish to participate on the same day, please expect to be bumped or rotated to another day as efforts to accommodate everyone will be taken.

We would also like to inquire as to anyone wishing to come in for **Lapidary Only Open Studio on Mondays.** Email Shirley at crystalc17@gmail.com

February - Monday's dates are 4, 11, 18, & 25