HUI PŌHAKU 'O HAWAI'I
Rock & Mineral Society of Hawai'i, Inc.

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CALCITE

BY DEAN SAKABE

The theme for our August meeting is Calcite. Calcite, which gets its name from "*chalix*" the Greek word for lime, is a most amazing and very common mineral. It is one of the most common minerals on the face of the Earth, comprising about 4% by weight of the Earth's crust and is formed in many different geological environments. Calcite can form rocks of considerable mass and constitutes a significant part of all three major rock classification types. It forms oolitic, fossiliferous and massive limestones in sedimentary environments. It serves as the "cement" for many sandstones and shales. Calcite limestone becomes marble from the heat and pressure of metamorphic events. Calcite is even a major component in the igneous rock called carbonatite and forms the major portion of many hydrothermal veins. Some of these rock types are composed of more than 99% calcite. So why would a collector be interested in such a common mineral? Primarily because of its extraordinary diversity, beauty and reasonable costs!

With calcite so abundant and so widely distributed it is no wonder that it can be so varied. The crystals of calcite can form literally a thousand different shapes by combining the various basic forms. In fact there have been more than 300 crystal forms identified in calcite and these forms sometimes combine to produce the thousand different crystal variations. Calcite also produces many twin varieties, and there are also phantoms or included crystals, color varieties, pseudomorphs and other unique associations.

Although it would be impossible to describe all of the varieties of calcite, here are a few standouts. Possibly the most well known of calcite's varieties is its most common form: the classic *scalenohedron* or "Dogtooth Spar" as it is sometimes called (1) . This variety appears as a double pyramid or dipyramid, but is actually a distinctly different form. The point of the scalenohedron is sharp and resembles the canine tooth of a dog, hence the name. Beautiful, clear, colorless or amber-orange examples of this variety are considered classics and outstanding examples come from Pugh Quarry, Ohio; Cornwall, England; and Elmwood, Tennessee.

Dogtooth Calcite with Marcasite (1)
Brushy Creek Mine, Reynolds County, Missouri

MEETING
Wednesday
August 27
7:00—9:00 pm
Makiki District Park
"Calcite"

NEXT MONTH
Wednesday
September 23, 2008

LAPIDARY
Closed for the Summer

MEMBERSHIP COSTS 2008

Single: $10.00
Family: $15.00

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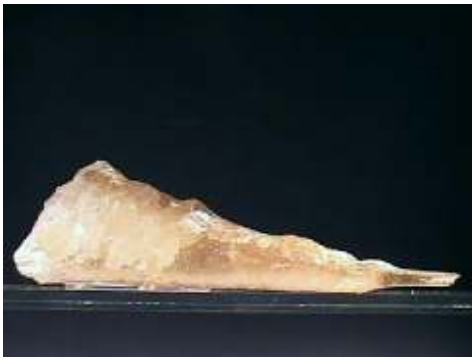
Calcite, page 2

Not necessarily a variety of calcite, cave formations constitute a unique aspect of calcite's story. (2) Calcite is the primary mineral component in cave formations. Stalactites and stalagmites, cave veils, cave pearls, "soda straws", and the many other different cave formations that millions of visitors to underground caverns enjoy are made primarily of calcite. It is the fact that calcite is readily dissolved that these formations occur. Overlying limestones or marbles are dissolved away by years and years of slightly acidic ground water to percolate into the caverns below. In fact the caverns themselves may have been the result of water dissolving away the calcite rich rock. As the calcite enriched water enters a relatively dry cavern, the water starts to evaporate and thus precipitate the calcite. The resulting accumulations of calcite are generally extremely pure, and are colored if at all, are done so by very small amounts of iron or other impurities.

Mexican Onyx is a variety of calcite that is used extensively for ornamental purposes. The carved figurines are so popular that it is hard to find a household which does not have a small onyx animal or two. Carvings such as vases, bookends, plates, obilisks, pyramids, statues, and the ever-present egg are all popular. It is not the same onyx as the quartz variety of onyx which is a little more precious (it is used in jewelry) and is banded white and black. Here Mexican onyx is banded with multiple orange, yellow, red, tan, brown and white colors that have marble-like texture.

Another variety is the so called "Iceland Spar", which is basically clear-cleaved fragments of completely colorless (ice-like) calcite. It was originally discovered and named after Eskifjord, Iceland where the calcite is found in basalt cavities. In rock shops around the world, iceland spar is available in large quantities and at affordable prices and is popular among children. Ironically, most of today's iceland spar comes from the far-away country of Mexico. Iceland spar displays the classic cleavage form of calcite, the rhombohedron. Iceland spar was and is used for optical equipment, and during World War II, it was a strategic mineral as it was used for the sighting equipment of bombardiers and gunners. It is iceland spar that best demonstrates the unique property of calcite called double refraction. If you have not guessed it yet, rock shops commonly place these calcite specimens next to Ulexite (or TV Rock). Double Refraction occurs when a ray of light enters the crystal and, due to calcite's unique optical properties, the ray is split into fast and slow beams. As these two beams exit the crystal, they are bent into two different angles (known as *angles of refraction*) because the angle is affected by the speed of the beams. A person viewing into the crystal will see two images ... of everything. The best way to view the double refraction is by placing the crystal on a straight line or printed word, and the result will be two lines or two words. In calcite, there is one orientation of the calcite crystal where there is only one image, (i.e. the beams of light are both the same speed), and that is parallel to the C-axis or primary trigonal axis. You find this by rotating the crystal parallel to the C-axis, until the line or word becomes whole again. By contrast, the direction perpendicular to the C-axis will have the greatest separation. The extremely high index of refraction of calcite that causes the easily seen double refraction is also responsible for the interference colors (pastel rainbow colors) that are seen in calcites that have small fractures. room, and the specimen should glow when this happens.



Calcite Stalactite (2)
Mexico

Calcite
2nd Sovietskiy Mine
Dal'negorsk, Russia

Barite & Calcite on Sphalerite
Elmwood mine,
Smith County, TN

Calcite
Elmwood Mine, Smith County, TN

Calcite with Pyrite
La Sirena mine,
Guanajuato, Mexico

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Pearls and Moonstones, page 3

Another property of Calcite is Florescence, phosphorescence, thermoluminescence, and triboluminescence. Although not all specimens demonstrate these properties, some do quite well. The most notable case of fluorescence occurs from the calcites from Franklin, New Jersey, where the massive calcite is enriched in a small amount of manganese and fluoresces a bright red under UV light. Some Mexican iceland spar calcites will fluoresce a nice purple or blue color, with some specimens even phosphorescing (continue to glow) after the UV source has been removed. Triboluminescence is supposedly a property that should occur in most specimens, however it is not easily demonstrated. To see this, the specimens have to be struck or put under pressure in a dark room, and the specimen should glow when this happens.

The best method (although it is self destructive) to determine if a mineral is calcite, is the acid test. Calcite will always bubble (effervesce) when even cold weak acids are placed on specimens. Even the cement in sandstones will effervesce assuring the geologist of identification of the cementing mineral. The reason for this is that Carbon dioxide is given off as bubbles and the calcium dissolves in the residual water. Just about any acid will produce these results.

Calcite is intricately tied to carbon dioxide in another way. Since many sea organisms such as corals, algae and diatoms make their shells out of calcite, they pull carbon dioxide from the sea water to accomplish this in what amounts to a near reverse of the reaction above. This is fortuitous for us, as carbon dioxide has been found to be a green house gas and contributes to the so-called "green house gas effect". Environmentally then, calcite is very important and may have been quite important to the successful development of our planet in the past. By pulling carbon dioxide out of the sea water, this biological activity allows more of the carbon dioxide in the air to dissolve in the sea water and thus the ocean acts as a carbon dioxide filter for the planet. Environmentalists are now actively engaged in determining if this activity can be increased by human intervention to the point of warding off the "green house gas effect". A significant amount of calcite precipitation in sea water is undoubtedly inorganic, but the exact amount that this contributes is not well known. Calcite and other carbonate minerals are very important minerals in the ocean ecosystems of the world.

Calcite is not the only calcium carbonate mineral. There are no less than three minerals or phases of Calcium Carbonate. Aragonite and vaterite are polymorphs with calcite, meaning they all have the same chemistry, but different crystal structures and symmetries. Aragonite is orthorhombic, vaterite is hexagonal, and calcite is trigonal. Aragonite is a common mineral, but is vastly outdistanced by calcite which is the more stable mineral at most temperatures and pressures and in most environments. Vaterite on the other hand is extremely scarce and rarely seen. Aragonite will over time convert to calcite and calcite pseudomorphs after aragonite are not uncommon.

For a starting mineral collector, Calcite is one of the best collection type minerals. There are lots of interesting forms and varieties, as well as colorful and beautiful specimens to collect. They are generally easy to identify using its rhomohedral cleavage and double refraction. Its reaction to acids makes for a great classroom addition, along with its florescence properties. Additionally it might be an accessory to other minerals, enhancing their attractiveness. Finally with its many different forms, environments, associations and colors, a collector could *never* have all possible combinations of calcite covered. That fact will lead to endless varieties.

Our Annual Rock Show
October 11-12
Outrigger Hotel

Members have an opportunity to be vendors or to exhibit their collections

Mahalo to the Outrigger Hotel!
Contact Keith if you would like to extend your mahalo

Calcite
Brushy Creek Mine,
Reynolds County,
Missouri

Calcite, Kansas

We are making some changes. Check out our news and notes section of the back page for new things and ways that *you* can contribute *your* stories.

BEAUTY AND THE BEAST: AN ECHO OF THUNDER

BY ELMORE EASTER

"Like the bones of dinosaurs buried under the shale of eras"

D.Randall, Cities Burning (1968)

One of the first phases of my 50 Year-Long preoccupation and fascination with gemstone polishing was with fossils. There were plenty of other subjects to look into, but my first love, and choice was with petrified dinosaur bones. Even today some people have an almost irresistible magnetic attraction and curiosity toward fossils, especially of the dinosaur.

To square the geological record-- Dinosaurs appeared on earth in what's called the *Mesozoic Era* of earth history--- extending from 245mya* to 65mya* (* million years ago). The Mesozoic Era itself is divided into three Periods : the *Triassic* from 245 to 208mya, the *Jurassic* from 208 to 146mya, and the *Cretaceous* from 146 to 65mya. At this time-- as an unproved theory goes -- a giant meteorite is thought to have impacted the earth somewhere off Eastern Mexico, causing the extinction of dinosaurs. --- so now, at the present time, we have some extinct petrified dinosaur bones to polish ! There may be some scientists who question a *total* extinction.

Children's eyes still ignite at the mention and concept of these ancient, exciting life forms, large and small, from a remote era unimaginable by many. Some of these children have become scientists, paleontologists, custodians, historians, and students of by-gone ages. Curiosity about early life on this planet has offered special opportunities, and avenues off the main strand.

Early, as a Colorado lad, I had become enamored of these fossilized bones -- and one of the enticements was the near presence of several collecting sites such as Dinosaur National Monument, straddling Western Colorado and Utah , and a fine locality around Canon city , site of the Royal Gorge, and close to Pueblo where I grew up.

So, as I settled down in East Norwalk in 1958, I acquired gem-polishing equipment, ending up with a 6" Diamond Pacific Genie gem maker, and a 10" diamond saw-- with which most of my dinosaur bone gemstones were produced. Then it was a matter of mail-ordering rough, agatized material to work on, which was easily done through ads in the Lapidary Journal, and Rock and Gem magazines--- now also through E-Bay or elsewhere on the Internet.

In earlier years, I preferred cutting mostly large, splashy-type 30x40 mm standard sized ovals-- even going to the larger 38x52 mm sizes--- all of them excellent for bola ties. Then later on, I moved to the more selective free-form designs, permitting originality, but requiring hand-made settings, instead of commercial ones. Usually, the general shape of the initial stone slab determined the final appearance of the polished stone. All in all, I filled several display cases of polished dinosaur bone, and allied fossils- most of which usually accepted a fine polish, similar to agate.

A companion to the bone is the inevitable petrified *coprolite* , or dino-poo, a co-gemstone. These generally outmatch the bone for colorfulness, and striking patterns, if not of more consuming interest.

The rough slabs were diamond-sliced into 5-6 mm thick slabs, which provided a convenient thickness for most cabochons. Shaping and smoothing was done by grinding wheels of descending coarseness , say from 100 grit down through 220, 600, 1200--- ending with fine polishing powders on a damp leather disc , such as tin oxide, cerium oxide, aluminum oxide, and Linde A, or others.

I was able to collect cabs enough for a few display cases, which were exhibited at our annual show in November, and at Club meetings. The gems are usually quite identifiable by the characteristic bone cells visible on the surface, using a 10 power loupe, usually carried by rockhounds

Welcome to our new column: *Readers Write!* We hope that you enjoy reading personal stories from members of our own Honolulu Rock and Mineral Society. Perhaps you have a story that you would like to share, too! It can be about anything at all: a great rock find, a great rock rumor that you heard, a great "rocky relationship" that you had. Anyone can contribute, We just ask for about 200 words, or no more than two pages. Please send stories to elise.thomasson@gmail.com

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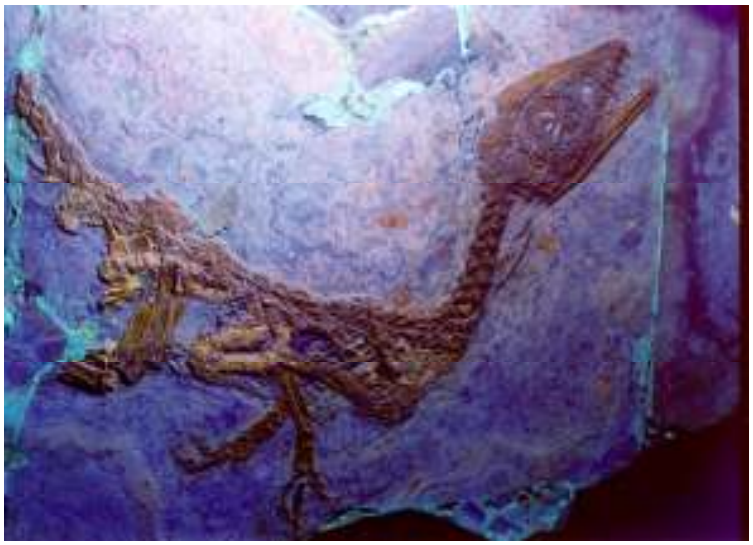
Readers Write! page 5

Usually one familiar with coprolite can recognize its brown, red, white, and yellow fanciful figures on a brownish , jasper-like matrix. Of course, there will be exceptions.

I found an interesting type of coprolite while engaged in micro-mineralogy -- this is the study of tiny mineral crystals by microscopy. After polishing gemstone of coprolite, I noticed the presence of radiating acicular crystals locked inside the matrix. Subsequently, I polished smaller specimens to examine, and indeed confirmed the narrow radiating crystals in the matrix. I elected to call this unusual material *sagenitic coprolite*, in view of the enclosed radiating needles, similar to the sagenitic agate phenomenon. In this situation, needlelike crystals apparently have grown through the soft gel of the fluid chalcedony before it solidified into microcrystalline matrix. There may be variants of this theory.

All in all , the past 50 years have been outstanding ones for me – especially my first love—petrified dinosaur bones, and corresponding coprolites. I was, of course, equally eager to work with many other types and varieties of fossils capable of accepting a polish, including petrified woods, Petoskey stones, turritella agate, fern buds, horn corals, cycads, bamboo, and other perhaps unrecalled varieties.



http://oregonstate.edu/dept/ncs/photos/rare1.jpg

Minutes Highlights

July 2008

Jade Emory, secretary

- Safety is our primary concern for Lapidary Class. Class will continue through August 21
- Stephen said that 260 people went through the tent to view the florescent stones at the Antique and Collectibles Show
- Thanks to Sybil, Faye, Marlene, Roger, Michael, Rodney, Terrilea, and Jade for presenting!
- Suggestions for next meeting include Quartz, orange and black minerals.

In order to read our full minutes, visit our website at:

http://pohakugalore.net/Hui_pohaku/Hiu_pohaku_1.html

Welcome to our new column: *Readers Write!* We hope that you enjoy reading personal stories from members of our own Honolulu Rock and Mineral Society. Perhaps you have a story that you would like to share, too! It can be about anything at all: a great rock find, a great rock rumor that you heard, a great "rocky relationship" that you had. Anyone can contribute, We just ask for about 200 words, or no more than two pages. Please send stories to elise.thomasson@gmail.com

Mahalo Mahalo and Vielen Danke for the card and DVD. It felt so nice to feel that aloha all the way out here in Germany! You guys are so much fun, I miss Hawaii Rock Club very much, and it's a pleasure to still be included as your newsletter editor. Thanks again!
-Elise

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News and Notes, page 6

DOOR PRIZES

Please note that we have instituted door prize drawings at our monthly meetings. Because of Hawaii's gambling laws, these drawings cannot be conducted in the common "raffle" format where tickets are sold. Rather, each *paid* member attending the meeting will receive a drawing ticket upon request. A voluntary donation of $1.00 is requested and encouraged. Drawings will be conducted at the end of the meeting with available prizes awarded in random order. You must be present to win. Please remember: if you win a prize, please bring one to the next meeting. This helps to keep our drawings going. Thank you.

WE HAVE A WEBSITE!
http://pohakugalore.net/Hui_pohaku/Hiu_pohaku_1.html

MAHALO TO MARKUS FOR HELPING US GET OUT OF THE ELECTRONIC *STONE AGE*!

THE METAPHYSICAL PROPERTIES OF CALCITE
BY BRENDA REICHEL OF CARATS AND KARATS, AND JADE EMORY

Calcite has been said to increase and amplify energy. It is a protecting, grounding and centering stone. It has been said to bring inner peace. It promotes creativity and imagination. Calcite is said to increase prosperity. It can be helpful in astral travel and channeling, as well as increasing intuition. Calcite is also a stone of spirituality and wisdom. This gem also reduces the stress and fear. Calcite is one of the premier cleansers of stored negative energies in the human system on all levels from the physical to the etheric. It is a purifying stone.

Physically calcites are good for back pain, increasing physical strength, teeth, eyes, and are generally good for healing. You can also use calcite for detoxifying and as for an antiseptic agent. Calcite is very helpful with emotional and mental conditions. Clear calcite can be used to open and balance the chakras. Calcite has been for learning disabilities and is a great stone for students.

NEW THINGS FOR THE NEWSLETTER—WE NEED YOU!

Elmore Easter had a wonderful idea. The great thing about Rock Club meetings is hearing the stories behind the rocks. Let's make that part of the newsletter, too! If you would like to contribute, feel free to send something to elise.thomasson@gmail.com. I'm looking for about 500 words, which is about 2 typed pages double spaced. It can be about anything from rock hunting, to a show you saw, to a person with whom you had a "rocky relationship." This will be fun!

Rock & Mineral Society of Hawai`i, Inc.

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The Rock & Mineral Society meets on the 4th Wednesday of each month (except for adjusted dates in November and December) at the Makiki District Park, 7:00 - 9:00 pm. Enter from Keeaumoku Street. Parking is free but limited.

The Newsletter is published monthly, some days prior to the meetings and is distributed in electronic format by email (Adobe Acrobat PDF file attachment). Printed copies are "snail" mailed to those who do not have email. The electronic format usually contains full-color images; the print version may be limited to B&W due to reproduction costs.

Any newsletter comments are appreciated, and can be sent to elise.thomasson@gmail.com

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