



The Newsletter of the Houston Gem & Mineral Society Houston, TX

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President's Message by Ray Kizer

y the time you read this, it will almost be time for the Tucson Gem & Mineral Show, the premier event of its kind in the world. Running for fifteen days from February 1–15, the city of Tucson plays host to literally hundreds of vendors spread out over multiple venues and exhibiting everything from fine mineral specimens to lapidary rough by the ton. (The Tucson Gem & Mineral Society too is putting on its 60th annual show on February 13–16 in the Tucson Convention Center, and the Smithsonian is bringing major displays of diamonds, gold, and gems there.)



Several members of our club make this event an annual pilgrimage. Hopefully you were able attend the recent Mineral Section

presentation by Tim and Holly Smith on *The Tucson Experience* and that their pictures and stories ignited some anticipation and excitement in you. The minerals offered at this show are some of the most magnificent examples you will ever experience. Get fired up and check it out.

As we enter February, the Board is making progress on several projects to rejuvenate the look of our meeting space. Plans are being evaluated for the best way to display our members' various awards and trophies. We are planning to repain the lecture hall and

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General Meeting Dates by Paul Brandes

anuary 28, 2014: Nathalie Brandes--Volcanoes--Beautiful Killers. Discussing different eruption styles, what makes some volcanoes much more dangerous than others, and why it might not be a good idea to build your dream home on the side of that picturesque mountain.

February 25, 2014: To be announced

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Every article published in the BBG is edited for grammar and content. No flaming is E-mail the Editor and Webmaster at allowed. pgeorge4@comcast.net

Purpose of HGMS

The objectives of this Society are to promote the advancement of the knowledge and practice of the arts and sciences associated with the collecting of rocks, minerals, fossils, artifacts, and their identification and classification; the general lapidary art; the collecting and identification of gemstones; the designing and execution of jewelry or metalcraft; and to provide the opportunity to obtain, exchange, and exhibit specimens and rough or finished materials.

Membership dues are \$40 for an adult membership, \$60 for a couple, \$75 for a family (including all children aged 5-18), \$25 for a youth membership (ages 5-18), and \$500 for an adult life membership. Advertising rates: \$70 for 2 months, ¹/₄ page; \$150 for 6 months, ¹/₄ page.

MEMBER: American Federation of Mineralogical Societies & South Central Federation of Mineral Societies.

All meetings are held at the Clubhouse which is located at 10805 Brooklet near the intersection of Highway 59 (Southwest Freeway) and Sam Houston Parkway (Beltway 8). See the calendar inside the back page for when the different Sections meet. The General Meeting is the fourth Tuesday of each month at 7:30. The HGMS Web site address is http://www.hgms.org.

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to add items from the Archeology and Beading Sections to our display cases. Our Clubhouse Chair has ideas for revamping the benches in the Lapidary shop, and we plan to add a security camera system to guard our access points and belongings. Much more can be accomplished with a little volunteer help. See Neal or myself if you can help out.

In recent days I have been talking with several new and existing club members, and they have confided in me that they are very interested in going on more club-sponsored field trips. And you know what, so am I. In an effort to promote this idea, I have asked each Section Chair if they can organize at least three group events this year. They may be as simple as a visit to a new exhibit at one of Houston's museums or an actual collecting trip in the field. If you have any ideas for an outing, please share them with your chair person and we will see what fun we can get on the schedule.

The Miner—How He Became Fascinated with Lapidary and Minerals

by John Anderson Member of the Houston Gem & Mineral Society

Memory Story One

As far back as I can remember, my family has always had a gold mine claim. But during the Second World War, all gold mines were closed—putting my family's interest on hold until after the war's end in 1945.

I was living in Los Angeles, California in an area called Highland Park, about seven miles from L.A., when I was 17 years of age and taking a photography class at Franklin High School in 1948. A boy named Burton Barfell also was taking the class. Burton would only stay for half of the class, and then he would disappear for the rest of the evening. One evening I asked Burton where he went when



he left the Photography Class. He said that he went to a Lapidary Class that was on the ground floor. "What is a Lapidary Class?" I asked. He chuckled and said, "It's the polishing of agates and jaspers and other kinds of rocks." I was satisfied with his answer, but I was not interested because I loved the Photography Class. Burton asked, "Why don't you go there with me tonight?" I was just about to go into the dark room to work on a photograph, so I said, "Maybe in a week or so." After a few weeks Burton asked again if I wanted to go to the lapidary class. This time I said, "Okay, but just for a few minutes."

We went to the class, and I met the Lapidary Class teacher—John Nelson. Mr. Nelson was a large man who had a Master's Degree in Philosophy, but he taught kindergarten in the daytime and lapidary classes five days a week at Franklin High School. Mr. Nelson was a Renaissance man because he could and did make all of the lapidary

THE BACKBENDER'S GAZETTE

equipment except the Highland Park saws and a few other items. Remember, this was before the use of diamond for grinding and polishing. Diamond was only used in the saw blades, and silicon carbide was used for grinding and some sanding. I saw people rotating a flat circular six-inch piece of glass, and it seemed they were trying to polish it with some sort of polishing compound. I asked my friend what they were doing, and he answered that they were polishing a reflective part of a telescope. That did not look like it would be fun because remember—I was a seventeen year old boy.



Mr. Nelson came to where I was standing and said, "Let me help you get started in preparation and in finishing a cabochon." First he took a small slab of tiger eye that was kind of reddish in color. Next he took a template and with a pointed aluminum rod, he marked the slab in the shape of a large cabochon. The next step, he took me to a small diamond trim saw and helped me cut the cabochon out of the tiger eye. Next we went to an area that had a pot with hot dopping wax, and then he attached my stone to a dop stick (a short piece of dowel rod).

Once the wax cooled, he took me to an area that had grinding and sanding wheels that had water spraying over all the different grinding and sanding wheels. The first wheel was a rough grinding wheel of silicon carbide that had 80 grit printed on its side. Then he went to the next 120 grit but only after the cabochon had really started to take shape. The cab really showed some promise after the 220 grit, and I thought it was ready for polishing, but Mr. Nelson said, "No, we have more steps to take first—a 400-grit sanding wheel and then to 600-grit. This group of wheels was rubber bonded, and they did the final finishing shape of the cabochon. After I worked the stone for ten minutes on the 600 grit sanding wheel, Mr. Nelson said, "Let's go and polish your stone" which was done on a cotton cloth buff wheel with cerium oxide as the polishing agent.

I was proud of my stone, but it was no longer a large cabochon but was now 30% smaller. But I was hooked. I did not go back to the Photography Class that night, and I attended very few days after that. I believe I still have that stone I made over 65 years ago somewhere. I was excited, to say the least, so I told my father John about my exciting Lapidary Class. He joined me at the Lapidary Class the next week, and I introduced my father to Mr. Nelson. They hit it off immediately because my father was a person who could make or repair almost anything—with or without the proper tools.

My friend Burton told me that he was going to the Glendale Lapidary & Gem Society meeting next week. He asked me if I wanted to go, which I did because the members donate rocks and slabs for the door prizes. I went to the meeting and bought four tickets for \$1. After the meeting started and just before the evening's program, they had their drawing. The first number that was drawn was one of my lucky ticket numbers. I went to the front and received my prize then started walking back to my seat

when they called another one of my numbers. I went back up and retrieved my second treasure. Back at my seat, looking and drooling over my new and first rocks that I now owned, they called another one of my lucky numbers. I almost felt embarrassed by winning three prizes from my purchase of four tickets. There was even heckling with one member saying, "Fix, Fix!" I felt somewhat embarrassed by my outstanding luck, but being only 17, I promptly forgot being embarrassed and only had the feeling of "Wow." I should mention now that I belonged to that club for many years and bought tickets for the door prizes at every meeting—but I never won a door prize again. Maybe something bigger was going on then, because it increased my interest in this lapidary hobby. So maybe it was meant to be.

At the Club meeting, they started talking about a Rockhound Field Trip they were going to sponsor next month at the Calico Mountains near the town of Barstow, California, for two days—Saturday and Sunday. They mentioned that the Calico Mountains is where large deposits of silver had been mined, but it was not like other mining areas such as Virginia City which followed a vein. The Calico silver deposits were just large deposits of silver with no vein to follow, making it very difficult to know where to dig next. They mentioned that other mining had occurred there many years ago, such as for Borax, but I believe that was before the big discovery of Borax in Death Valley, California. They mentioned that there was even a mining ghost town where people claim to have heard strange sounds that seemed to be coming from the ghost town when the moon was full. Burton said that he and his Aunt were going to go on this trip, and I was welcome to ride with them. Burton's Aunt drove a Model A Ford with a front seat and a rumble seat that is just behind the cab and out in the open. Guess where I had to sit—in the rumble seat.

We left from our home in Highland Park and drove to the Calico Mountains at a neckbreaking speed of 35 miles per hour, but sometimes we were lucky and hit 40 when coasting downhill. After many hours of driving, we finally came to the town of Barstow. We continued on to the settlement of Yarmo which was about one mile from the Calicos. Yarmo had only a gas station and a few houses, and that was all. From Yarmo we went up a road called Mule Canyon just as the sun was about to set, arriving at the club's camping area for the next two days. The variety of the club members' camping gear and facilities was a sight. Some brought trailers; pickup trucks, which they slept in the beds of; tents; army cots; and sleeping bags. I did not even own a sleeping bag, but I had two blankets.

The Club group began preparing their evening meal around a big roaring fire. After eating, they started singing old songs, and that eventually turned into ghost stories. A few even recounted some ghost stories that centered on the Mining Ghost Town. When the embers from the fire were almost burned out, everyone went to their sleeping area for a night's sleep and also to appreciate the beauty of the heavens above. The different constellations were a sight to behold—well worth the trip just to see the display of the unpolluted night sky.

Get last-minute news about club events by sending a note to Jim Kendall at kendal_ja@yahoo.com I rolled up in my two blankets with no mattress. My eyes would not stay open, and I drifted off to sleep for about three or four hours when I felt a big bump in the night. I was scared, afraid that maybe a Mining Town Ghost was visiting me. After being bumped a few more times, I finally got enough nerve to peek out of my blanket. A large dog was standing next to me in the dim light. No one had brought any animals with them, but when the dog starting licking me, I knew that it was not a threat and I got up. The dog was thirsty because it began licking the water bottle next to my blankets. I gave the dog some water and a few crusts of bread that I had, and it seemed to satisfy its hunger because it sat down and just looked at me. After ten minutes, the dog came closer to me. It just looked at me with its expressive eyes as if to say "thank you," then it turned and trotted away toward a desolate area of the desert. The dog knew exactly where it was going because of the determined way it hurried from my camp. When I say it knew exactly where it was going, I meant just that—because when I was ten years old, I had a dog that walked 25 miles to find my mother without even knowing where my mother was, and it found her when she was in a hospital.

After my first night and the dog experience, the sun came up with all the splendor of a beautiful sunrise in the desert. The hills, mountains, and canyons were all in beautiful pastel colors. Everyone found many different types of agates, jaspers, and petrified palm wood that day for it was scattered everywhere in many different areas. In 1948, an abundance of lapidary material lay on the surface at many locations in California and in other states. If you wanted to, you could fill your auto with material until your tires burst.

Memory Story Two

I was in the state of Wyoming heading toward Montana and then home to Highland Park, California driving a Plymouth passenger car with rocks on the floor of the passenger side, on the back seat, on the floor and in the trunk. I had found and purchased petrified wood, jade, and many types of agate. I know how much weight I was carrying because I weighed the rocks when I got home—1,200 pounds. I traveled about 1,000 miles with this load and had to replace 5 different brand-new tires because the other tires blew out. I know the tires were new because I put new tires on my Plymouth just before I left my home for this trip. Luckily I had a warranty on my tires, so I could afford that trip or it would have been a disaster. I remember that I had just replaced one tire that blew out in Los Vegas, Nevada, and I had only driven about 70 miles when I had another blow out. It was about 2 a.m. in the morning, so I pulled into a gas station and told the attendant I needed to have the tire replaced. The attendant said that he did not know if he could honor the warranty because the tire label had not even worn off. By the way, they did honor the tire warranty.

I don't know if cars can talk or have a personality, but when I reached my home in Highland Park and emptied my Plymouth of all of my rocks, I heard someone or something say "Oh what a load."

Memory Story Three

This story from The Miner happened while traveling to the State of Montana from Wisconsin and eventually ending the trip in Los Angeles, California. In this story, the Miner was joined by my wife Mickey, my father John, and my mother Dorothy. We had visited friends in the state of Wisconsin, were driving through the state of North Dakota, and heading toward Montana to collect some Montana agate. As we were traveling through North Dakota, we noticed a sign saying, "Join us at our County Fair." We thought it would be a good way to walk around and loosen the cramped-up feeling in our legs from driving for many miles. We also thought we might be able to find something good to eat at the Fair. The Fair was a small affair that had the normal displays that all County Fairs have, but they had a few things that were unusual—like fenced-in cages with different types of wild birds from the area.

Among the birds was a cage with a great big Golden Eagle. This bird was magnificent in its size and color. My father, mother, my wife, and I were fascinated by this bird, and we just stood there looking at this Golden Eagle. A small crowd had also gathered, looking at the Eagle. There was a man in his 30s who was dressed in the finest Western clothing from his spit-shined boots to his cowboy hat. This individual was very vocal, letting everyone know that he was there for his high volume of talk that was directed to no one in particular.

The Cowboy started making fun of this great bird about how the bird looked and especially the way it walked. Big birds do not take a simple step like most animals because the bird's legs bend in the opposite direction from land animals who have knees. What we perceive as a bird's knee is actually its ankle. Big birds kind of hop to the next step in moving forward. The Cowboy continued his banter of insults toward this Golden Eagle—for what reason, nobody could understand. Only a chicken wire fence structure separated the Eagle from the crowd—with about two feet between the Eagle and the Cowboy.

The Cowboy started pointing his finger at the Eagle and even started shaking his finger. The Eagle seemed to understand the derogatory remarks that the Cowboy was making because the Eagle starting looking at the Cowboy—and only the Cowboy—as the Cowboy tried to get even closer to the fence. The Golden Eagle looked intently at the Cowboy, then bobbed its head a couple times and did an about-face. It then lifted its tail and I will say "blasted" with extreme pressure Golden Eagle excrement all over the spit-shined cowboy boots, his gabardine pants, and half of his western shirt—all were ruined. The odor was something that only a giant Golden Eagle mother could be proud of, and it covered almost the whole of the cowboy's outfit except his Western hat and neckerchief. Everyone in the group started screaming with laughter with what they had just seen as the Golden Eagle getting back at his heckler.

The Cowboy seemed like he died for a few moments. He did not move, but looked at his formerly beautiful boots, pants, and shirt, and mumbled something under his breath that was so soft that no one understood him. Finally, he disappeared into the crowd. The question that was on every one's lips was, "Where do people get the idea that all animals are dumb and do not know what is going on around them"?

Legendary Goldfield—Short but Sweet!

by Nathalie Brandes Member of the Houston Gem & Mineral Society Originally published in Mindat

Discovered in 1902, Goldfield quickly grew into Nevada's largest city. Peak production from the rich but confusing epithermal ore occurred in 1910. By 1912, both the population and production were declining. In those few short years, Goldfield rose to prominence and faded into obscurity, but it remains a fascinating locality for those interested in geology and mining history.

Goldfield is located in the Goldfield Hills about 45 km (28 mi) south of Tonopah, Nevada. The mining district sits at an elevation of ~1740 m (~5700 ft), although the surrounding hills rise as high as 2100 m (6900 ft). The climate is arid, resulting in little vegetation. Highway 95 runs through Goldfield today, but early in the 20th Century, three standard-gauge railways also served the city (Ransome, 1909; Ashley and Albers, 1975).

The Goldfield Mining District sits at the western margin of a Tertiary volcanic center (Ashley and Silberman, 1976). Typical rocks of the district include volcanic breccia, rhyolite, quartz latite, trachyandesite, and rhyodacite overlying Ordovician metasediments and granitic rocks (Ashley, 1974; Ashley and Albers, 1975). The oldest of these volcanic rocks are Oligocene (30-31 Ma [million years ago]). During this eruptive episode, a caldera and associated ring fracture system formed. After a period of quiescence, volcanism resumed around 22 Ma with the eruption of trachyandesite and rhyodacite (Ashley, 1974; Ashley and Silberman, 1976).

Goldfield is the largest known high sulphidation gold deposit in North America (Blakely et al., 2007). These types of epithermal deposits tend to form adjacent to volcanic centers where magmatic volatiles, such as HCl and SO_2 , rise and are absorbed by meteoric water, resulting in an acidic fluid that leaches rock (White and Hedenquist, 1995). In the case of Goldfield, this mineralization occurred about 20-21 Ma with the shallow emplacement of a pluton. Ore fluids followed fractures and faults associated with the prior volcanic activity of the region, including the Oligocene ring facture system. Rock closest to the factures was silicified whereas rock farther from the fractures was argillized (Ashley and Albers, 1975; Ashley and Silberman, 1976). Supergene mineralization occurred between 9 and 12 Ma based on alunite formation (Ashley and Silberman, 1976).

The Goldfield Mining District occupies an area of about 39 km² (15 mi²) of hydrothermally altered rock; however the richest ores were concentrated in an area of only 1.3 km² (0.5 mi²) (Ashley, 1974; Ashley and Silberman, 1976). Gold occurred within the silicified zones of the altered Tertiary volcanic rocks (Collins, 1907; Ransome, 1909; Locke, 1912; Ashley and Albers, 1975). Changes in grade, even within the silicified zone, were abrupt, often going from rich ore to barren rock within a meter (3.3 feet) (Collins, 1907; Ransome, 1909; Ashley, 1974; Ashley and Albers, 1975). Typically the highest grade ore occurred in brecciated parts of unoxidized ore zones. Often the brecciated pieces would be covered with quartz, pyrite, famatinite, tetrahedrite-tennantite, bismuthinite, goldfieldite, native gold, and sometimes tellurides and sphalerite. This ore commonly produced 440-580 oz/ton gold. The richest carload of ore, however, was extracted from the Mohawk Mine in 1906 and produced 609.6 oz/ton gold and 75.4 oz/ton silver (Ashley, 1974).

The first claims at Goldfield were staked on 4 December 1902 by Harry Stimler and William Marsh, a pair of prospectors who had been grubstaked by Jim Butler of Tonopah (Elliott, 1987). The prospectors named their site "Grandpa." Soon more gold strikes were made, more claims were staked, and a rush to the new district began. By 1903, a town was organized and given the name Goldfield (Zanjani, 2002). Mines in the district operated under a leasing system in which a company was granted a lease along a vein and paid the claim owner a percentage of the production after operating costs. This led to the development of many mining companies until most were consolidated by George Nixon and George Wingfield as the Goldfield Consolidated Mines Company (Ransome, 1909, Elliott, 1966; Elliott, 1987).

Just five years after the initial discovery of ore, Goldfield became the largest city in Nevada with a population near 20,000 (Zanjani, 2002). The glory days of rich ore in Goldfield were short-lived. Labor tensions rose with the arrival of the Western Federation of Miners union, and strikes broke out in 1906 and 1907. Fearing violence as had occurred in Leadville, Colorado and other mining towns, federal troops were dispatched to maintain order. The strike ended with no major episodes of violence, and mining companies refused to employ Western Federation of Miners members. Peak production from the mines occurred in 1910 with 539,000 oz. gold and 118,000 oz. silver produced (Ashley, 1974). Following that year, large numbers of the population began leaving. By 1912, a local mining engineer reported to a friend that all who were able had left that spring. Mining continued for a few more years, but in 1919 the Goldfield Consolidated Mill shut down, and with it large-scale mining ended (Zanjani, 2002).

The town seen today is but a small part of what once existed. A major flash flood destroyed part of the town in 1913. Ten years later, a bootlegger's still ignited a fire that swept through many of the remaining buildings (Zanjani, 2002). If one visits Gold-field today, one can still see the hotel, the courthouse, the school, and of course, the headframes and tailings piles of a legendary mining locality.

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Mineral Section Upcoming Programs by Paul Brandes

February 5, 2014

What's Hot in Tucson, 2013: Come get in the mood for the Tucson shows by viewing the DVD summary of last year's show. Narrated by Dave Wilber and Bob Jones, this DVD brings you the Tucson experience without the travel or expenses. For those who saw last year's DVD, you know the quality of this program is quite impressive. Refreshments will be provided.

February 19, 2014

DVD of attendees' choice: Due to the participation of many Mineral Section members in Tucson, those not able to attend can chose a DVD from the Library to view (the tentative choice is to continue with another part of the 2012 "What's Hot in Tucson") or attendees can discuss their possible collecting plans for the spring/summer. Refreshments will be provided.

Porcelaneous Datolite of the Keweenaw Peninsula, Michigan by: Paul T. Brandes Member of the Houston Gem & Mineral Society

atolite: When one thinks of this mineral, they usually envision the beautiful green crystals of Dal'nagorsk, Russia or perhaps Mount Sainte-Hilaire, Que bec. However, there is another lesser-known variety of datolite that is perhaps more rare than the crystallized form; this would be the porcelaneous variety that is found on Michigan's Keweenaw Peninsula. The following is a brief description of what a datolite is and its mode of occurrence in Michigan, what gives the datolites of Michigan their striking coloration, historical information, and early collecting.

Introduction: Datolite, Nassau Mine, MI

Datolite is classified as a calcium borosilicate hydroxide with the chemical formula of $Ca_2B_2Si_2O_8$ (OH)2. The most common form is as monoclinic crystals that are glassy in appearance and complex in habit. In Michigan, datolite also forms in crystals; however, the most common form on the Keweenaw Peninsula is in porcelaneous masses that can range from the size of a pencil eraser to as big as a bowling ball, and they can weigh as much as 150 pounds.



Datolite, Nassau Mine, MI

In the Lake Superior district, datolite forms alongside the great native copper deposits con-

tained within the Portage Lake Volcanics (PLV). Datolite occurs in fissure veins and brecciated basalt flowtops. Interestingly, datolite is not found in the conglomerate interflow deposits of the PLV. The porcelaneous datolite occurs in several modes; as a fracture filling to produce narrow veins, as cement in the brecciated flowtops, and as semi-round nodules resembling a head of cauliflower. The datolite has a texture that ranges from a dense porcelain-like appearance to a more sugary, granular material and can be translucent to opaque. The one feature of the Michigan datolite that draws people to it, however, is its phenomenal range of color, which can cover the entire spectrum range.

Historical Information

Dr. C.T. Jackson is credited with the first written description of datolite, which he wrote in his diary as "datholite." In an entry from 1849, Dr. Jackson wrote in his diary that "datholite may prove of economical importance as either a flux for copper ores or as a material suitable for the manufacture of borax." Dr. Jackson also made mention of a native copper deposit on Isle Royale that was so rich in datolite that they named the location Datolite Mine.

In 1859, J.D. Whitney wrote about fine datolite crystals being found on Isle Royale and also at Keweenaw Point. Whitney also described the first reported occurrence of a

porcelaneous mass of datolite at the Minesota Mine in Ontonagon County. He described the mass as having the appearance of a "rusty cannonball," and that upon breaking the nodule open, he discovered that the mineral inside was "quite compact, opaque, perfectly white, and resembling pure marble."

It wasn't until 1895 when Osann wrote of occurrences of crystallized datolite at several of the mines on the Keweenaw including the Clark, Osceola, and Copper Falls. In the paper was also mention of the very colorful datolite nodules with copper inclusions that were being discovered in the Pewabic Lode.

The first comprehensive work on the native copper deposits of the Lake Superior District was completed in 1929 by Butler and Burbank. United States Geological Survey Professional Paper No. 144 listed datolite as being noted in fissure veins and amygdaloidal lodes of the District but again, not from the conglomerate lodes. In the Paper was also a paragenetic sequence that puts the deposition of datolite in the District as an intermediate- to late-stage mineral when compared to native copper deposition.

Colorization of Datolite Nodules

One of the first things that collectors and other people in general notice when they first observe a datolite nodule from Michigan is the wide range of colors and patterns the nodules can have. The most common color of Michigan datolite is bone white, while the most valuable and desirable color is yellow, and the rarest of colors appears to be the purple and blue varieties. The earliest writings about Michigan datolite make mention of native copper flakes scattered in the nodules, but they give very little attention to coloration or its causes. It wasn't until 1978 that an official scientific study was conducted when Michigan Technological University in Houghton began research to determine the causes of coloration in datolite. Since this time, several other studies have been conducted to determine the possible causes of coloration in specific datolites. From this research, it has been determined that pure datolite occurring in nodular form is white. A pink/red to yellow color was most likely the result of iron oxide (Fe₂O₂) in varying crystal sizes of the iron, while chalcotricite was the likely cause of coloration for orange and red datolites. Oxidation of copper minerals during supergene enrichment, which can result in malachite and chrysocolla, give the nodule a green or blue color. Other minerals that give datolites their color include (but are not limited to) tenorite, bornite, cuprite, and rarely-azurite.

Early Collecting and Beyond

In the early days of mining on the Keweenaw Peninsula, employees of mining companies began collecting minerals such as copper and silver to either display in their homes or to sell as "collector specimens" to buyers all over the United States. It is believed that datolite was not considered a collector mineral at this time, partly because the inner beauty could not be revealed unless sawed into with specialized equipment which, at this time, was not readily available. In later years, other mining employees and specific mineral collectors began to amass huge collections, although these focused mostly on crystallized specimens such as copper, silver, and calcite. It wasn't until mineral collectors such as J.T. Reeder and Dr. L.L. Hubbard (who were also mining employees) acquired outstanding yellow and salmon-colored datolites from the Pewabic Lode that datolite became a true "collector mineral" in the Keweenaw.

Datolite, Quincy Mine, MI

Throughout the late 1800s and into the early 1900s, collectors had access to underground material through miners and, to some extent, even mining captains. However, by about 1920, all of the great fissure mines had closed, and thus the supply of "fresh" datolites had ended. The amygdaloidal lodes were still producing copper, and a few collectors were allowed access to the poor rock piles to search for specimens. By the 1940s and 1950s, collectors began to search the piles in all three counties



Datolite, Quincy Mine, MI

(Keweenaw, Houghton, and Ontonagon) to collect datolites and also to classify nodules so that a particular color or pattern in a given datolite nodule could be associated to a specific mine or lode. By the 1960s, datolites began gaining the eye of more collectors throughout the Midwest and central United States, with more and more people coming to the Keweenaw in search of the colorful datolite. During this time, several collectors in the Keweenaw had amassed very sizable and important collections of datolites from throughout the Peninsula. By 1970, the days of going to a poor rock pile and easily collecting a nodule of datolite for yourself were done. From this point on to today, datolite collecting has been a hit-and-miss proposition at best. Occasionally, a new and exciting find of a datolite "nest" is reported, but it is usually short lived as collectors rush to strip every last nodule from a location. Another common practice is to wait for a particular county to set up crushing equipment at a poor rock pile and then search the area of the pile where material has been removed. This again has provided a few new and exciting finds, but one has to be quick to collect before it is stripped clean.

Of the over 300 known mines and exploration prospects on the Keweenaw Peninsula, only about eighty have produced datolite nodules while less than half that number have produced collector-quality nodules. According to experienced collectors on the Keweenaw Peninsula, three mines have produced enough quality datolites to be considered classic localities. These are the Delaware Mine in the northern section, the mines of the Pewabic Lode in the central section, and the Caledonia Mine in the southern section. Each of these mines is famous for producing nodules of exceptional color, size, and unfractured in nature. Datolites from these locations also command some of the highest values of any found on the Keweenaw Peninsula.

Today, as more and more of the poor rock piles are being removed for various projects on the Keweenaw Peninsula, datolite nodules are getting more difficult to find every year. Sometime in the not too distant future, when either all the piles are removed, or the remaining piles are sold to private individuals who do not share the same interest of collecting specimens, the practice of going to a poor rock pile and finding your own datolite nodule will just be a romantic memory.

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Whitney, J.D., 1859, Notice of New Localities, and Interesting Varieties of Minerals in the Lake Superior Region. American Journal of Science. Vol. 28. p. 8-20.

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Faceting Section Upcoming Programs by Pat Hildbold

February 12, 2014

Ed Katz will present a program on using GemCad and/or a gem microscope covering focus and viewing.

March 12, 2014

Margo Bedman and Ed Katz will compare topaz, quartz, and CZ: visual and weight characteristics and how you can use them to identify stones. They will cover both rough and faceted stones.

April 9, 2014

Introduction to the refractometer: Introduction to the refractometer. What it's used for, and how to use it.

Manganese Nodules and the CIA's Deep Ocean Mining Venture by Jonathan A. Woolley Member of the Houston Gem & Mineral Society

ecently two brown "uglies" joined the rank-and-file specimens in my mineral collection. If they stand out in a cabinet, it is not for their beauty, but because they look strangely out of place. As any true collector will tell you, however, sometimes the history of a specimen is its true beauty. What exactly does the CIA have to do with it? Well, that's what makes the story worth telling!

In the summer of 1974, the newly built *Hughes Glomar Explorer* set sail for a remote spot in the North Pacific. Reclusive billionaire Howard Hughes had commissioned this giant ship to exploit deep ocean floor deposits of polymetallic nodules, containing potentially commercial quantities of manganese. The *Explorer*'s enormous hold was purported to house a submersible able to be lowered through the ship's moon pool and capable of harvesting these nodules from abyssal depths. The world was fascinated by the idea, coming from such a legendary eccentric as Howard Hughes. Other companies raced to catch up with Hughes, and some universities created ocean engineering courses to prepare students for what was sure to be a growing career field. But that is not what really happened.

As it happens, this deep ocean mining story was nothing but an elaborate cover. During the middle of the cold war in 1968, the Soviet Golf II class nuclear submarine K-129 disappeared in the North Pacific en route to its patrol area north of Hawaii. Despite mounting a massive search, the Soviet navy was unable to locate the lost submarine. She sank with all hands after drifting far off its intended course. No one will ever know for sure what sank the K-129, but one plausible explanation is the accidental ignition of the fuel tanks on two of the sub's missiles in their launch tubes during a "dry" launch test. The sounds of its hull collapsing were recorded by three of the Sound Surveillance System (SOSUS) sonar arrays deployed by the United States in the North Pacific to monitor Soviet submarine traffic. Narrowing the potential location of the K-129's resting place by triangulating from the arrival times of the sonar recordings, the USS Halibut submarine was almost miraculously able to locate the wreckage of the K-129 resting nearly 16,000 feet deep on the ocean floor.

Photographs taken by the *Halibut*'s crew showed that about one third of the *K-129*'s hull was intact, possibly holding several valuable pieces of intelligence—nuclear-tipped missiles and Soviet naval codebooks. After receiving approval from the Nixon administration, the CIA developed a monumental plan to recover the relatively intact portion of the sub. It would take an engineering marvel to accomplish it, as well as one of the most ingenious cover stories ever devised to hide this covert operation in plain sight. The plan was named Project Azorian.

Howard Hughes agreed to provide the cover story of the sea-floor mining venture, and commissioned and paid for everything on the surface while being covertly repaid by the CIA. A capture vehicle was designed with seven hydraulic arms exactly arranged to

close around the intact portion of the K-129's hull like a giant claw. The wreckage would then be hoisted by the attached pipe string through the *Explorer*'s moon pool doors directly into her hold without the operation ever being visible to surface observers. The Soviet high command apparently was tipped off by a mole in Washington to the real purpose of the *Explorer*'s presence in the middle of the northern Pacific, but they never considered the submarine recovery story plausible. Nevertheless, they did monitor nearly the entire operation from a "fishing trawler" and another ship nearby.

In the end Project Azorian was only partially successful, although even partial success seems amazing given the challenges. The capture vehicle was successfully positioned above the submarine, and the arms deployed around the remains of the hull. The *Explorer*'s crew began slowly hoisting the *K-129* toward the surface. About 6700 feet above the ocean floor, several of the arms on the capture vehicle broke, sending most of the submarine hurtling back down to the ocean floor. Only a 38-foot section of the *K-129* was safely brought into the hold of the *Explorer*. After pumping the seawater out of the hold, specially trained crews combed the wreckage to see what they could recover. The remains of six of the *K-129*'s crewmen were discovered, and were given a proper burial at sea complete with the Soviet national anthem. The service for the submariners was recorded to prove the remains were treated with all due respect, and the film was given to the Russian government a few decades later following the collapse of the Soviet Union.

What was actually recovered from the K-129 is still classified, but it is doubtful that the project achieved the intelligence bonanza that it might have if they had recovered the entire intact portion of her hull. However, it is rumored that a few manganese nodules were brought up in the ocean-floor sediments that came up along with the submarine. This brings us back around to the parallel thread of the story.

After being mothballed by the US Navy in 1978, the redesignated USNS Glomar Explorer had a somewhat ironic second life when it was leased by a consortium of companies for the very purpose that had initially served as its cover story. Ocean Minerals Company (a consortium which included subsidiaries of Standard Oil, Royal Dutch Shell, and others) leased the Explorer to test a prototype seafloor mining vehicle. Although the



The *GSF Explorer*, deepwater drillship with an intriguing history that began as the *Hughes Glomar Explorer* (photo from Wikimedia Commons).

venture was technically successful, this and several other attempts to mine manganese nodules from the seafloor were all non-commercial.

The *Glomar Explorer* is now on its third life, still extracting resources from the deep ocean. In 1997, she was converted into a deepwater drill ship, leased by GlobalSantaFe, and subsequently purchased by Transocean after the two companies merged in 2010. The *GSF Explorer*, as she is now called, is most recently employed drilling deepwater oil and gas wells offshore Indonesia for Marathon Oil.

Although it is impossible to tell if the particular manganese nodules in my collection were brought to the surface by the *Glomar Explorer* during her mining days or by some other venture, the ship and her story are a good part of the reason they sit on my shelf. All that history from a few ugly brown rocks—can you see their beauty now?

Selected references:

Project Azorian: The CIA and the Raising of the K-129, Norman Polmar and Michael White, Naval Institute Press, 2010

The CIA's Greatest Covert Operation: Inside the Daring Mission to Recover a Nuclear-Armed Soviet Sub, David Sharp, University Press of Kansas, Lawrence, KS, 2012

Other reading and documentary films (information found on Wikipedia may not be completely accurate, but it is easily accessible):

http://en.wikipedia.org/wiki/Project_Azorian http://en.wikipedia.org/wiki/GSF_Explorer http://en.wikipedia.org/wiki/Soviet_submarine_K-129_(1960) http://projectazorian.com http://projectjennifer.at http://www.deepwater.com/fw/main/GSF-Explorer-147C17.html?LayoutID=17

Drop of Water Test for Topaz

from Rock Chipper via many newsletters, via SCFMS Newsletter 1-2/2014

uartz and topaz are not easy to separate by eye, and sometimes it is impossible when the quartz is a true topaz color.

There is a big difference in price between the two, and anyone describing quartz as "topaz," however innocently, may well be in trouble.

Topaz is quite a different mineral and is harder than quartz. Because of this, a drop of water will not spread on topaz but will spread on quartz.

Clean the stone as effectively as possible with a cloth or handkerchief to remove all traces of grease. It must be dry before the test. Then place a spot of clean water on it with a thin glass or metal rod. On stones with a hardness of less than 7 on the Mohs scale, the water is dispersed. On harder stones it will remain a globule. The harder the stone, the more rounded will be the globule.

Board of Director's Meeting Minutes

January 7, 2014 by Nancy English

Х	President - Ray Kizer	Х	Archeology Rep - Garth Clark
	1st Vice President - Paul Brandes	Х	Beading Rep - Jillynn Hailes
Х	2nd Vice President - Beverly Mace		Day Light Rep - Mary Ann Mitscherling
Х	Treasurer - Rodney Linehan	Х	Faceting Rep - Gary Tober
Х	Secretary - Nancy English	Х	Lapidary Rep - Phyllis George
	Past President - John Caldyne		Mineral Rep - Sigrid Stewart
		Х	Paleontology Rep - Mike Dawkins

wests were Michele Marsel and Clyde McMeans.

Call to Order: President Ray Kizer called the meeting to order at 7:35 p.m. with a quorum of eight members present.

President's Comments: Ray Kizer welcomed the new Board members to the opening of the 2014 HGMS Board meetings and congratulated the previous Board members for their continuing efforts and enthusiasm for making the HGMS one of the premier clubs in both the American Federation and the South Central Federation of Mineralogical Societies. He thanked all the members and representatives for their commitment to making the 2013 Gem & Mineral Show such a grand event, and he hopes that in the preparation for the 2014 Show, all the Sections will again work together to promote enjoyment of our shared hobby.

Previous Month's Board Minutes: Gary Tober moved and Mike Dawkins seconded that the minutes of the December 2013 Board Meeting be accepted as published in the January 2014 BBG. The motion passed.

Treasurer's Report: Rodney Linehan e-mailed financials to all Board members in advance of the meeting. Rodney reported 2013 Show profits of \$13,800.

Office, Committee, and Section Reports

Archeology Section: Garth Clark announced that the Archeology Section met on January 2, 2014. Terry Proctor gave a presentation on a newly-found Hominid fossil (a third metacarpal bone) which was dated at 1.4 mya (millions of years ago). The new find is significant because it is the first fossil of this age to contain a styloid process, a physiological advancement necessary to allow the hand to rotate—a requirement to become a tool maker. The next meeting is February 6, 2014 at 7:30 p.m., and the speakers will be Robert and Nancy Moore who will give a presentation on Neolithic sights in Great Britton. The Archeology Section is planning a field trip to the Roads of Arabia exhibit at the Houston Museum of Fine Arts on Thursday, February 13.

Beading Section: Jillynn Hailes reported that the December meeting was on the day of the Christmas party. The next meeting is January 18, 2014 at 1:30 p.m. Kay Maddox will be teaching crochet beading. There is a \$10.00 per person fee to participate in the class.

Day Light Section: Mary Ann Mitscherling was not in attendance. The next meeting is scheduled for January 13, 2014 at 1:00 p.m. Jim Paras will be teaching skills for crafting with aluminum foil. On February 10, Neal Immega will be demonstrating Patinas.

Education Committee: Charlie Fredregill was not in attendance. Jillynn Hailes reminded the Board that Carrie Hart has volunteered to head the Education Committee. Ray Kizer suggested that Carrie e-mail Charlie about her wish to volunteer for the post and to copy it to both Ray and Nancy English.

Faceting Section: Gary Tober: The next meeting is on January 8, 2014 at 7:00 p.m. The subject of the meeting will be (Part 1) on gem identification—tools and techniques, given by Margo Bedman and Ed Katz. February's program will continue with Part 2 presented by Ed Katz.

Lapidary Section: Phyllis George reported that the next meeting is scheduled for January 20, 2014 at 7:30 p.m. The subject of the meeting will be announced at a later date.

Lapidary Garage Sale: It will be held at the HGMS Club House on Saturday, February 8, 10 a.m. to 3 p.m. The Section is selling large quantities of rough including carnelian, West Texas agate, amethyst, jade, lapis, jaspers, miscellaneous jewelry, and more.

Phyllis received a complimentary copy of a dictionary of Mineral and Lapidary terms written by Diamond Dan, and she turned it over to the Mineral Section. The pamphlet wholesales for \$2.00, and the suggested retail price is \$5.00–\$10.00. Ray Kizer commented that the Mineral Section has already created its own similar publication which it sells in the Info Booth during our Show. Currently the Section has 500 copies.

Mineral Section: Sigrid Stewart was not in attendance. The next meeting is scheduled for January 15, 2014, at 7:30 p.m. during which Tim and Holly Smith will share tips and insights on **The Tucson Experience**—what it is really like to peruse the many vendors at what is now the largest Gem and Mineral show in the world. Tim and Holly will share stories and photographs of the many shows they have attended over the years. This year's Tucson show (which is held in multiple locations in Tucson and is put on by the city of Tucson) runs from February 1 through February 15. The Tucson Gem & Mineral Society holds its own show February 13–16 in the Tucson Convention Center.

Outreach Committee: See New Business.

Paleo Section: Mike Dawkins. The next meeting is on January 21, 2014 at 7:30 p.m. The subject of the meeting will be announced.

The Paleo Holiday Party once again is being held during their regular February meeting on Tuesday the 18th—in the middle of the boring mid-winter season. All members are invited. There will be an auction and dinner.

Publicity Committee: No report

Show Committee: Michele Marsel is the 2014 Show Chair. She reiterated the 2013 Show's profit of \$13,800. There will be no full Show Committee meeting in January. Michele will concentrate on confirming the subcommittee chair positions and on meeting with dealer and publicity subcommittees. The contract for the 2014 Show typically is signed in mid- to late January. Michele will attempt to negotiate with the Humble Civic Center for a better price. The other venues currently being investigated are not available in 2014 during our Show weekend. The first Show Committee meeting is on Tuesday, February 11.

Youth Section: Beverly Mace. The shop was busy during the last meeting as this was the first opportunity for the Youth members to begin work on new projects since December 7, 2013. The Youth Section won seventeen awards at the 2013 Show. They are planning a field trip for Spring Break or during the second week in June.

BBG Editor and Webmaster: Phyllis George announced that Wednesday, January 8, is the deadline for articles for the February BBG. She will redirect the President@HGMS.org e-mail address to Ray Kizer and revise the Education@HGMS.org e-mail address so it is sent to both Ray Kizer and Charlie Fredregill. She also will update the Web site with the 2014 Officer list.

General Meeting Presentation: January 28, 2014 7:30 p.m. – Nathalie Brandes will provide an educational talk on volcanoes and how they work. She will be discussing different eruption styles, what makes some volcanoes much more dangerous than others, and why it might not be a good idea to build your dream home on the side of that picturesque mountain.

February 25 General Meeting: Dr. Robert Bakker, world-renown Paleontologist and dinosaur hunter and also a curator at The Houston Museum of Natural Science, is TENTATIVELY scheduled to speak if his schedule allows. Watch the Web site for updates as they are received.

Old Business

2013 Holiday Party/Auction: Michele Marsel coordinated the party and auction held on December 14, 2013. The auction featured lapidary materials from Frances Arrighi's estate as well as faceting equipment and jewelry-making tools. Neal Immega served as auctioneer, and the Auction raised \$3,979 in highly competitive bidding for over 130 items in 2 hours. Proceeds from the Auction will be divided between the Day Light Section and the two club funds as previously approved by the Board.

Club Data Backups: During the December Board meeting, a motion was raised and passed for the purchase of two 1-terabyte external hard drives. The two backup drives

are to be dedicated to the retention and preservation of important club documents, data, and accounts. The Board approved funds of up to \$200 for this purchase. Michele Marsel volunteered to purchase the drives and to document a backup plan that will be e-mailed to Board Members for input. It was further agreed that one drive should be kept in the locked file cabinet located in the HGMS office, and the second backup drive should be housed at an offsite location which was still to be determined (perhaps with whomever is the current HGMS President). Michele Marsel reported that she will be completing this project this month.

Bylaws Update: The 2013 Board approved the updates to the Bylaws. During January Michele Marsel will complete the final document by incorporating all the changes, and it will be uploaded to the Web site for members to read. (It would take up too much room in the BBG to publish it there.) A month later during a General Meeting, the membership will take a final vote to accept it or reject it.

HGMS Annual Scholarship: We need to advertise the scholarship more widely to area college professors with a goal to obtaining more applicants for the scholarship. We have had only one applicant in each of the past two years. As promised, Pete Stassi submitted a draft of a letter to be sent out by 2014 President Ray Kizer in early January announcing the program to college professors, college department heads, and to college registration offices. Pete presented a list of eighteen area universities and seven junior colleges that have appropriate degree plans. He included contact information for department chairs and administrators: their names and addresses, e-mails, and phone numbers. While all applicants must live in Harris County or in one of its adjacent counties, they can be attending any Texas college or university with an earth science degree.

Club Renovations: Options were discussed for gaining increased wall space without covering the windows in the meeting room. The Board will further discuss the ideas presented at the February meeting.

Security Monitoring Cameras: Garth Clark accepted an Action Item to watch for sale pricing on security systems. He will purchase one, then head up the design and installation of a new security system at HGMS. The Board chose a self- monitoring system with 10 cameras. The sale price typically is under \$1,000, so there will be plenty of money in the approved budget for cables and brackets.

New Business

Dunn Southwest Board: Michele Marsel replaced Terry Proctor as Dunn Southwest Director for the HGMS in 2014. Dunn Southwest manages the property that contains our building.

Registered Representative: Michele Marsel replaced Terry Proctor as the Registered Representative for 2014, a position required by the Secretary of State as a legal action contact.

Change Banks: Rodney Linehan accepted an Action Item to find a new banking relationship for HGMS. Our current bank has been purchased, and its locations near the

clubhouse and the show venue are closed.

HGMS Annual Scholarship: Pete Stassi provided a brief presentation of the results of his research of schools for our 2014 Scholarship initiative. See OLD BUSINESS.

Outreach to military veterans – Gary Tober accepted an Action Item to contact the Houston Veterans Administration Offices to suggest a program to invite veterans to the Club to learn lapidary and metalwork skills. Ray Kizer suggested that the Veterans Administration would need to coordinate their transportation to our shop.

Adjourn: Jillynn Hailes moved to adjourn the meeting, and Garth Clark seconded. The motion passed unanimously, and the meeting adjourned at 9:45 p.m.

Ever Come Across Green Obsidian?

by Andrew D. Thompson from Mineral Minutes 2/2104, newsletter of Mineralogical Society of the District of Columbia

For many mineral club members, one of the practical signs that they've heard a great presentation is if they leave the monthly meeting fired up to learn more about the mineral or geology discussed and perhaps with a desire to get into the field to do some major collecting. The January 2014 MSDC presentation by Smithsonian geologist Tim Rose hit the nail on the head. He unpacked for us the geological makeup of the mysterious stone masks of the Teotihuacan culture whose capital was 30 miles northeast of today's Mexico City. What makes them mysterious is they were created by a people about whom we know very little. So how the masks were used and what functions they served have puzzled anthropologists for decades. We do know they were master builders whose two large pyramids are still standing, and some evidence of hundreds of smaller pyramids and precise city planning in many ways equaled that of the Egyptians. After thriving for nearly five centuries, the people of Teotihuacan seemed to have abandoned their city in 550 CCE and disappeared from history.

Keep in mind that this was the largest city in Mesoamerica, about 20 square miles in size, and it housed well over 100,000 persons. Yet they left behind no writings, names of rulers, or explanations of their identity, history, rituals, or values. That vacuum of information ultimately resulted in Tim and his colleague, anthropologist Dr. Jane Walsh, traveling to Teotihuacan—most recently in late 2013—to research the geology and anthropology of the culture's famous stone masks. Fortunately, they gained access to more than 60 masks housed in the National Museum of Anthropology and the National Museum of Teotihuacan. Their careful research documented that the masks were composed exclusively of four soft forms of stone: serpentine, travertine, limestone, and listwanite, a carbonate altered form of serpentine. None of the masks were made of obsidian because, as a hard rock, it would be extremely difficult to carve into a facial mask. Tim and Jane also tentatively concluded that the pattern of holes drilled into the masks provided a means to dangle ornaments, so then perhaps the masks served as a center piece in a larger artistic construction.

What I want to share with readers in this article, however, is a fact peripheral to the talk

but which captured my imagination. Tim referred to the Teotihuacan people mining and working with obsidian. Like the opulent city itself, this obsidian was unlike any other obsidian known throughout the Americas. It had a green or green-gold tint which, during those centuries, was highly prized by peoples throughout Mesoamerica and even to the far north, beyond the Rio Grande. Some say it was the production of this green-colored obsidian, made into cutting blades, weapons, scrapers, jewelry, etc., which subsidized the entire Teotihuacan culture, including its massive buildings and murals which covered the interior walls of seemingly every household. What we do know is its production contributed to the economy, even if it was secondary to the role of agriculture. The irony is that this culture had no metal, and yet, its obsidian blades were sharper and superior to any metal or steel blades that existed then or even today. In other words, this green obsidian was their "metal," and it was as good as gold for trading purposes with other cultures.

Say the word "obsidian," and what normally comes to mind is a jet black glassy stone found as the residue of volcanic lava. It is **felsic**, meaning it has a composition similar to granites, which includes **fel**dspar and **si**lica. It forms when a flow of lava suddenly cools and forms black glass which is easily knapped into objects with extremely sharp edges. That cooling is relatively sudden because it takes place above ground (extrusive) rather than below ground (intrusive).

Throughout the history of our planet, volcanoes have been pervasive, and so black obsidian is fairly common. Geologists have mapped the ancient lava flows of Mesoamerica and found evidence of multiple lava flows, with later flows burying earlier flows. Some geologists have argued that in Mesoamerica, however, there is a limited quantity of black obsidian, compared to its more abundant presence elsewhere. But they have found three sites in the Valley of Mexico. Each mine is near Teotihuacan, and they have yielded the



extremely rare, high-quality, green obsidian. Its non-black color and sometimes chatoyant quality is due to its almost total lack of any inclusions or impurities. As a result, it looks a bit similar in color to green glass, except the obsidian typically has very few bubbles and usually is a deep green color. Glass, of course, does not allow knapping. Aside from these three mines, the green obsidian found elsewhere is of lower quality, is milky in color, and its edges—when backlit with a strong light—are not translucent. When knapped into blades, the higher-quality obsidian had edges that were sharper and more lasting than any material known at the time.

The elite rulers of this culture kept total control over its production and traded extensively throughout Mesoamerica. Its importance is appreciated when we realize that any piece of this green obsidian, when it began to lose its sharpness, would be repurposed from, say, precision cutting to less demanding scraping, and so on, down through a hierarchy of practical uses. Today, those mines continue to yield green obsidian though nowhere near in the quantities produced by the people of Teotihuacan. Steel has taken over these practical needs for today's householders, but mineral collectors, of course, prefer obsidian.

For some anthropologists, this green obsidian has yielded some fascinating clues about the culture. While studying the contents of the burial sites, and correlating their content with the dating of the burials, they believe they found something very interesting. For the earlier centuries, they found green obsidian in the form of little figurines or trinkets, equally, in the graves of the rich and the poor. But



in the final decades of the culture, immediately prior to 550 CCE, they found little or no green obsidian in the graves of the common people. Forensic research on the bones and teeth indicated that those same common people suffered severely from malnutrition, while the bones of the elite showed no such degradation. That finding, when placed side by side with the discovery of the charred remains of the city's elite housing and temples, has raised a question: was the collapse of the culture due to a revolt by the lower class? Given the buildings of the commoners showed no sign of burning or destruction, it lends some credibility at least to raising the question.

Unbelievable as such self-destructive behavior may at first appear to be, I remember as a young adult in 1968 seeing houses, food stores, and shops in downtown DC being set afire when the local residents became very frustrated. So the anthropologists' suggestion that Teotihuacan may have collapsed under political and economic strains may not seem as farfetched as it may first appear.

There were also signs of additional social strains, including severe climate change, such as drought, in the early decades of the 6th century. There was also evidence that over the centuries, the Teotihuacan regime had totally deforested their world by burning limestone 24–7 to manufacture the plaster used on their temples and in the interior walls of all their houses. Those murals portrayed the rituals of the priests and elite rulers and so seemed to serve as a political message, validating and reinforcing the authoritarian rule of the upper class. Whatever the factors contributing to the downfall of this culture, one important relic is the green obsidian they have left behind.

Speaking for myself, I have never come across a piece of Teotihuacan green obsidian. But a wonderful aspect of collecting, whatever the desired object, is that once your mind has a few clear pictures of what you are looking for, you have a far better chance of finding it and learning more about it—as researchers such as Tim and Jane continue to contribute to our understanding.

Show Time 2014

February 1-15	Tucson, AZ	Tucson Gem & Mineral Shows Over 40 shows and venues throughout Tucson
February 1-28	Quartzsite, AZ	Desert Gardens RV Park 1064 Kuehn St. www.desertgardensrvpark.net
February 13-16	Tucson, AZ	Tucson Gem & Mineral Society Tucson Convention Center, 260 S. Church Ave. tgms@tgms.org; www.tgms.org
February 15-16	Plainview, TX	Hi Plains Gem & Mineral Society Ollie Liner Center, Business I-27S e-mail: josefcmacha@aol.com
March 1-2	Robstown, TX	Gulf Coast Gem & Mineral Society Richard M. Borchard Regional Fairgrounds 1213 Terry Shamsie Blvd. www.gcgms.org
March 8-9	Pasadena, TX	Clear Lake Gem & Mineral Society Pasadena Convention Center 7902 Fairmont Pkwy sara_chelette@sbcglobalnet.com www.clgms.org
March 15-16	San Antonio, TX	Southwest Gem & Mineral Society San Antonio Events Center 8111 Meadow Leaf Dr., Loop 410 & Marbach krbotx@gvtc.com www.swgemandmineral.org
April 12-13	Abilene, TX	Central Texas Gem & Mineral Society Abilene Civic Center, N. 6th & Pine St. kmcdaniel23@suddenlink.net; rockclub.txol.net
April 25-27	Houston, TX	Fine Mineral ShowsAnnual Show Embassy Suites Hotel, 2911 Sage Rd. Near The Galleria-Houston. e-mail: dave@finemineralshow.com www.FineMineralShow.com
April 26-27	Lubbock, TX	Lubbock Gem & Mineral Society Lubbock Memorial Civic Center 1501 Mac Davis Lane E-mail: walt@lubbockgemandmineral.org Web site: www.lubbockgemandmineral.org

2014		February				2014	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
						1 10–5 Shop Open 10–12 Youth Section	
2 10–4 Shop Open	3	4 7:30 Board Meeting	5 7:30 Mineral Section 10-3 Shop open	6 7:30 Archeology Section	7	8 10–5 Shop Open Lapidary Garage Sale 10 a.m3 p.m.	
9 10–4 Shop Open	10 1:00 Day Light Section	11 7:30 Show Committee	12 7:00 Faceting Section 10-3 Shop Open	13	14	15 10–5 Shop Open 10-12 Youth Section 1:30 Beading Section	
16 10–4 Shop Open	17 7:30 Lapidary Section	18 7:30 Paleo Section	19 7:30 Mineral Section 10-3 Shop open	20	21	22 10–5 Shop Open	
23 10–4 Shop Open	24	25 7:30 General Meeting	26 10-3 Shop open	27	28		
2014			Marc	h		2014	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
						1 10–5	
						Shop Open 10–12 Youth Section	
2 10–4 Shop Open	3	4 7:30 Board Meeting	5 7:30 Mineral Section 10-3 Shop open	6 7:30 Archeology Section	7	Shop Open 10–12 Youth Section 8 10–5 Shop Open	
2 10–4 Shop Open 9 10–4 Shop Open	3 10 1:00 Day Light Section	4 7:30 Board Meeting 11 7:30 Show Committee	5 7:30 Mineral Section 10-3 Shop open 12 7:00 Faceting Section 10-3 Shop Open	6 7:30 Archeology Section 13	7 14	Shop Open 10–12 Youth Section 8 10–5 Shop Open 15 10–5 Shop Open 10-12 Youth Section 1:30 Beading Section	
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