



The Backbender's Gazette



The Newsletter of the Houston Gem and Mineral Society



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President's Message

by Sigrid Stewart

There is not much to report on the rock-hounding or club front this month! Just a couple of days ago, I had Jim issue an order on our e-Blast closing the clubhouse to all but Shop Managers and club officers on essential business. Like the rest of the city, like the rest of the world, we are shutting down and holding our breaths, hoping that the first wave of Covid-19 will pass us by. The news from China, Italy, Spain, should convince everyone of the wisdom of foregoing meetings, classes and shop work for a month... or so. So we hope!



I do wish there were good rock-hounding sites close by to go collecting. Being outside looking at rocks would be safe, but traveling very far could mean staying at a hotel, where strangers of unknown health from unknown locations are also staying!

For now, we wait. I personally am doing some spring cleaning. I am going through rocks in my garage, which is overly full of rocks and lapidary rough. Later I will have items to donate. I'm sure many of you are doing something similar. I pray you are all well, and stay safe, and that our community will not suffer too much from this epidemic. May we soon return to the freedom to live our lives and pursue our interests as before.

Vice President's Message

by Mike Sommers

With the cancellation of the March general meeting and the uncertainty regarding April, there is not a confirmed presentation for this month. Please check the weekly emails, the HGMS facebook page, and the HGMS website next month for status updates. Thank you for your patience!

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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 metal craft; and to provide the opportunity to obtain, exchange, and exhibit specimens and rough or finished materials.

Membership Rates

- 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.

2020 HGMS Officers

- President Sigrid Stewart President@HGMS.org
- First Vice President Mike Sommers Programs@HGMS.org
- Second Vice President Beverly Mace Membership@HGMS.org
- Secretary Nancy English Secretary@HGMS.org
- Treasurer Tatyana Kuhn Treasurer@HGMS.org
- Archaeology Board Member. Nancy Engelhardt-MooreArchaeology@HGMS.org
- Beading Board Member Maggie ManleyBeading@HGMS.org
- Daylight Board Member Fred Brueckner
- Faceting Board Member Matthew Phillips Faceting@HGMS.org
- Lapidary Board MemberPhyllis George
- Mineral Board Member Steve Blyskal Mineral@HGMS.org
- Paleo Board MemberMike Dawkins Field_trips@HGMS.org

HGMS Section Chairs

- Archaeology Section Chair Bob MooreArchaeology@HGMS.org
- Beading Section Chair Kim Fuselier Beading@HGMS.org
- Day Light Section Chair..... Nancy Searle Daylight@HGMS.org
- Gemstone & Faceting Section Chair. Randy Carlson Faceting @ HGMS.org
- Lapidary & Silversmithing..... Anthony Lucci Lapidary@HGMS.org
- Mineral Section Chair Stephen Blyskal Mineral@HGMS.org
- Paleo Section Chair Neal Immega Paleo@HGMS.org
- Youth Section Chair Beverly Mace Youth@HGMS.org

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 times when the Sections meet.
The General Meeting is the fourth Tuesday of each month (except Dec.) at 7:30.
The HGMS website address is **<https://hgms.org>**

Membership Accomplishments

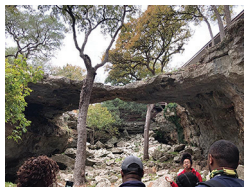
by Mike Sommers

As we kick off our search for the 2020 HGMS Earth Science and Lapidary Arts Scholarship recipient(s), please read Kira Mitchell's letter about how our efforts benefit the recipients. If you know any potential students who could benefit from our scholarship program, please encourage them to apply! Our application is downloadable year-round from our website (<https://hgms.org/education/scholarships/>). To be considered for the 2020 awards, please return your application to scholarships@hgms.org by June 5. Any questions can also be sent to that address.

As I progress through my second semester at the University of Houston - Downtown, I would like to once again thank the Houston Gem and Mineral Society for giving me the opportunity to be more successful, via the Earth Science and Lapidary Arts Scholarship. In the fall semester of 2019 the scholarship helped cover my tuition, as well as the cost of supplies for my first geology field trip to the Llano, Texas area! We visited lots of outcrops to examine faulting, igneous intrusions, folds, and fossils. We also stopped at a stone cutting establishment to look at some different minerals. The owners let us collect from a huge pile of scraps and students got to take home as much as they wanted. I definitely took a cooler home full of pieces so heavy I could hardly carry it. Our last stop was a tour of the natural bridge caverns. This was beneficial not only as an experience, but for my overall comprehension of the geology classes I have and will be taking. Being able to apply knowledge I've learned in class to real examples was greatly rewarding. In fall semester of 2019, I took structural geology and geochemistry courses. Being my first geology classes after physical and historical, I really started to understand how wide of a subject earth science can reach. My biggest takeaway from the semester was a new love for chemistry. I enjoyed geochemistry so greatly that I am now considering it as a path for my future research and career. Currently, I'm enrolled in paleontology, atmospheres of Earth and planets, and hydrogeology. I'm enjoying these classes as it once again broadens not only my knowledge of geology, but earth science as a whole. These classes have become influential in my day to day life. I've reached a point where I am regularly applying my knowledge to my surroundings, including teaching others as well. All of this progress would have been a strain if not for the help of the HGMS scholarship. I am eternally grateful for the help it provided in kickstarting my journey at a new university as an aspiring geologist.



Photos by Kira Mitchell



Outcrop 2



Outcrop 3

Archaeology Section

by Jay Rousell and Nancy Engelhardt-Moore

March 5, 2020: Garth Clark called the meeting to order at 7:35 PM. There was no new business. He introduced our speaker Chris Kilgore who presented ***"The Invention of Rope and the Roots of Western Civilization"***. Chris started the presentation by demonstrating a rope making technique using horse hair manes. The hairs that he began with were no longer than 8 inches. The individual hairs were spread out and then, balled into a bundle. From that, he used the "tarabilla" to create larger pieces of cordage, which were combined to make a rope the length desired. Then, he used



Rope Making Technique Photo by John Rich

energy and tension to create rope of decent quality. Chris learned his techniques from Bill Brett about 20 years ago, who learned them during the Great Depression from his grandfather. Bill would demonstrate these techniques at Texas cultural gatherings. Chris noted that when you start making longer ropes, you quickly realize that you need multiple people and a language that allows you to cooperate. He became interested in the origin of these techniques, which he learned had been preserved for thousands of years. The photo (right) shows Chris with fiber in his left hand, which he is spinning into thread, finished rope in his right hand, and his fiber-spinning and rope-making tool in his lap.

Chris became interested in researching the origins of rope making. Next, he showed a Cro-Magnon bone tool that was found in a rock shelter. The bone tool's use has been under debate, and Chris began to think that maybe some of these tools were used for rope making. During this period in human history, both reindeer antlers and horse hair were readily available resources. To test his theory, Chris began to look at these tools for diagnostic wear that would be similar to the "tarabilla" tool used during historic times. He examined bone tools in the British museum. Some of the tools were "repaired" from broken pieces, and therefore, they were compromised from a diagnostic perspective. So, he realized that he would need technology to identify more microscopic wear. Finally, he was able to collaborate with someone at the National Museum of Natural Science on other tools, and they were able to see the wear he suspected.

Then, Chris began to look for ropes in artwork. In various inscribed fragments, apparent ropes can be found in artifacts that would have been dated over 17,000 years old. While you can imagine they would have had raw hide cordage, Chris believes it wouldn't have been practical to accomplish some of the things with horse hair that are apparently

represented in some of this ancient art. The oldest direct evidence of rope is from a Lascaux Cave in France, which yielded a carbonized rope. When it was found, various tests were done assuming it was made from plant fibers. Therefore, the tests did not yield any answers. However, Chris believes, if they had tested to see if it was hair fiber, they would have potentially learned more. Unfortunately, the artifact was lost and can no longer be tested. Other examples were presented by Chris, such as an apparent horse bridle on artwork that would have been made long before the domestication of the horse. Chris, who teaches at the University of Houston, published an article on this topic. To learn more, go to: https://www.researchgate.net/profile/Christopher_Kilgore3. Finally, a big thank you to Garth Clark for stepping up and chairing the meeting!

Upcoming Archaeology Programs

April 2, 2020: Dr. Justin Parkoff with the Houston Maritime Museum, will present the “*USS Westfield Recovery and Restoration Project*” (POSTPONED).

May 7, 2020: Bob Moore will present “*Excavating at Ancient Salona, Croatia*”. Last fall, Bob and his wife, Nancy had the exciting opportunity to participate in an archaeological dig to probe the remains of a visible apse in the Greco-Roman City of Salona, which is situated in the modern town of Solin just to the northeast of Split on the Adriatic Sea. The goal of the fieldwork was to determine the purpose of the building, which might be the remains of the first public Christian church. The Moore’s were part of a team of “tourist” volunteers and, archaeologists and students from the University of Zagreb that investigated the site. It is known that Bishop Domnio decided to build a church in Salona although it was illegal and that in 304 A.D., Emperor Diocletian had him executed within the arena of the amphitheater. Come and learn more about St. Domnius, the Patron Saint of Split and find out what the Moore’s uncovered during their excavating adventure.



Examining Artifacts



Dig Site
Photos by Mary Engelhardt - Moore

June – August, 2020: The Section will take a Summer hiatus. Watch for our exciting lineup of Fall programs in the August Issue of the Backbender’s Gazette.

Daylight Section *by Nancy English*

These spilling teacups hang in the garden. The crystals catch the light!



Spilling Teacups Photo by Nancy English

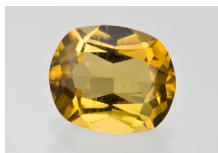
Tourmalines

By Randy Carlson

Information Sources: GIA, GemGuru, ISG, IGS, Photos provided by Randy Carlson using Google Images



TOURMALINES



Tourmaline Color

Tourmaline has one of the widest color ranges of any gem species, occurring in various shades of virtually every hue.

- Many tourmaline color varieties have inspired their own trade names:
- Rubellite is a name for pink, red, purplish red, orangy red, or brownish red tourmaline, although some in the trade argue that the term shouldn't apply to pink tourmaline.
- Indicolite is dark violetish blue, blue, or greenish blue tourmaline.
- Paraíba is an intense violetish blue, greenish blue, or blue tourmaline from the state of Paraíba, Brazil.
- Chrome tourmaline is intense green. In spite of its name, it's colored mostly by vanadium, the same element that colors many Brazilian and African emeralds.
- Parti-colored tourmaline displays more than one color. One of the most common combinations is green and pink, but many others are possible.
- Watermelon tourmaline is pink in the center and green around the outside. Crystals of this material are typically cut in slices to display this special arrangement.



TOURMALINE

Types of Tourmaline

Though there are nearly a dozen species, there are three main species most commonly known under the Tourmaline name.



- **Elbaite species:** This group is the species that is usually seen in jewelry. This species includes rubellite (ranging from red to pink), indicolite (blue to green), verdelite (Green) and, rarely, achroite (colorless). Though the Elbaite species is what eventually made Tourmaline famous in its usage for modern jewelry, it is not the most common of the Tourmaline species. The elbaite group derives its name from the small Italian island known as Elba where these stones and their heavy lithium makeup were first thoroughly chemically examined.
-
- **Schorl species:** This is the most common tourmaline species to be found in nature. Schorl tourmalines are typically black, sometimes with a blue or brown tint. These Tourmaline are estimated to comprise up to 90% of the tourmalines on the planet, though these are not the stones typically used in the gem and jewelry industry. Their coloration is caused by large quantities of iron in their chemical makeup.
- **Dravite species:** These stones, being rich with magnesium, are characterized by dark colors ranging from dark brown yellow to brown black. Because of their lack of brilliance and not being very transparent or reflecting much light, these stones, like those of the schorl species, are not commonly used in jewelry.



Coloring Elements in Tourmalines



A tourmaline's chemical composition directly influences its physical properties and is responsible for its color.

- Tourmalines make up a group of closely related mineral species that share the same crystal structure but have different chemical and physical properties.
- They share the elements silicon, aluminum, and boron, but contain a complex mixture of other elements such as sodium, lithium, calcium, magnesium, manganese, iron, chromium, vanadium, fluorine, and sometimes copper.
- Be aware that some tourmalines can have up to SEVEN colors within the same crystal.



Physical Properties



- **Refractive index:** generally 1.62 – 1.64 +/- (variation due to this gem being in the isomorphous replacement series group)
- **Moh's Density Rating:** 7-7.5 (hard as quartz, but is brittle!)
- **Specific gravity:** 3.06 (+.20 -.06)
- **Crystal System:** Trigonal
- **Optics:** Double Refractive, Uniaxial Negative, Birefringence of .014 - .044
- **Identification:** Pink can be easily confused with Topaz. SG & Optic Figure is key to ID
- Very general example of Tourmaline's chemical composition – $\text{X1Y3Al6(BO3)-3Si6O18(OH)4}$
- **Where:** X = Na and/or Ca and Y = Mg, Li, Al, and/or Fe2+
- Tourmaline has one of the most complicated chemical formulas. Each species will have its own specific formula to account for the chemicals, minerals and elements present that cause the varied coloration found in Tourmaline



Mining Locales

Considering their chemical complexity, the wide geographical range where Tourmalines are found is impressive.



Tourmalines were originally found in Sri Lanka in the early 1700's, but Brazil has now become the largest producer of tourmalines due to the expansive network of pegmatite dikes that traverse the country.

Within the past three decades, major deposits of intense blue green Tourmalines were found in Paraíba, Brazil. These Paraíba Tourmalines are highly sought after for their intense color. Brazil and Africa (Nigeria, Mozambique and Tanzania) are the top producers of Tourmaline.

Brazil is most known for producing nearly every color of Tourmaline from its mines. Mozambique has large quantities of indicolite Tourmaline and others similar to the Paraíba Tourmaline of Brazil. Additionally, deposits of fine gemstone quality have been found and mined in Afghanistan, Madagascar, Pakistan, Sri Lanka and the United States (California and Maine).

- **Pala Chief & Oceanview Mines – Pala, California**
- **Himalaya Mine – Santa Ysabel, California**
- **Mt. Mica Mine – Paris, Maine**

Gemstone and Faceting Section Butterfly and Flower Bracelet

by Theresa and Matthew Phillips



Silversmithing by Theresa Phillips; Faceted Man-made Quartz by Matthew Phillips

We're Not Getting Older -- We're Getting Better!

by *Pyrite Pete*

Just when y'all thought things couldn't get worse, well looky here! Old Pete found something! My gem for today is, **Never Give Up!** especially when the going gets tough.



I want you to think of your *best ideas*, do your *best work* and be the best version of yourself in the process. Can you do it? Oh yes, **don't forget to share your work with the Backbender's audience!**

Send your gems to news@hgms.org and drsharonathomas@sbcglobal.net. Being the **Ideal Observer**, I guarantee it won't go unnoticed!

Lapidary and Silversmithing

by Sharon Thomas

Toni Lucci shared his extensive skills on casting. This course is excellent as, Toni teaches to each individual student's level of development, with positive and patient encouragement. If you want to take his classes, you had better register early!

Photo by: Laura Copland



Casting using Cuttlefish Molds

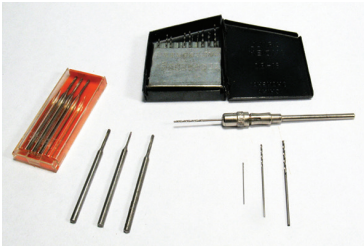
Brad Smith's Jewelry Tips

Be more productive! See Brad's How-to Books www.amazon.com/author/bradfordsmith

Article and Photos by Brad Smith

Problems with Small Drills

Drilling small holes can be a problem. With drills that are less than 1 mm (18 gauge or .040 inches), some chucks will not tighten down well enough to hold the drill securely.



Drill Adapter



Chuck Adapter

The problem is easily solved in either of two ways - with a chuck adapter or by buying your small drills with a 3/32 inch shank size. Either way you have a large shank to be gripped in your drill press, Foredom or Dremel, so changing bits is fast and easy.

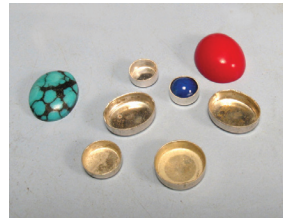
Pre-Made Bezel Cups

As a general rule of thumb I assume it's going to take me 15 - 20 minutes to make a bezel for an ordinary cabochon, so for some projects buying pre-made cups can save a lot of time. But if you go this route, keep in mind three things.

First, try to get cups made from fine silver, not sterling. Fine silver is softer and burnishes over the stone more easily.

Second, you may have trouble matching the shape and size of the stone with the shape and size of the bezel cup. Purchased cups can only be found in a limited number of standard sizes. You may have to adjust your choice of gemstone to match the cup. The other consideration is that pre-made cups often have fairly low side walls. While these are fine for low-dome stones, they're not dependable for stones with steep side walls.

Lastly before setting, check the fit of your gemstone in the cup, particularly around the bottom. The bottom corners of a stamped cup are much more rounded than a bezel you would fabricate yourself. This causes a problem with stones that have a sharp edge around the bottom. Burnishing the bezel over one of these stones will place a lot of stress on the stone and may cause it to crack. To avoid this, I round off the bottom edge of the stone with a diamond file (or use sandpaper on soft stones).



Bezel Cups

Paleontology Section

Article and Photos By Neal Immega, PhD



Cambrian age (Hickory Sandstone) Ventifacts from a field near Mason, Texas.

I have just hung on the lecture hall wall a wonderful collection of ventifacts collected by Irene Offman. I purchased this collection years ago at an HGMS auction and I think everyone should see it.

Ventifacts are rocks that have been sand-blasted by the wind into angular shapes. They depend on the wind being directional. These stones have a distinctive look: the buried sides are often rounded and the tops have flats or smooth curves corresponding to the direction(s) of the wind. Common places to find modern ones are on desert pavement and sea coasts. The Mars robots have also seen them on that planet. Ventifact Ridge in Death Valley National Park, Ca.

On the Oregon coast, recognizable ventifacts have been created by the wind in as little as 30 years. The ones that Irene found are “fossils” because they were made by the wind in the Middle Cambrian (Hickory Sandstone Member) about a half of a billion years ago and recently exposed in a field near Grit, Tx. The field is just off Hwy 29n at N30.801046, W-99.333884 (note these are decimal degrees). I have visited the locality and found more specimens there.



Basalt rocks in the Libyan desert that have been faceted in several directions.



Ventifact Ridge in Death Valley National Park, CA

Find out more:

Blake WP (1855) On the grooving and polishing of hard rocks and minerals by dry sand. *Am J Sci 2nd Ser* 20:178–181 [Google Scholar](https://scholar.google.com/scholar_lookup?%20author=WP.%20Blake&journal=Am%20J%20Sci%202nd%20Ser&vvolume=20&pages=178-181&publication_year=1855) https://scholar.google.com/scholar_lookup?%20author=WP.%20Blake&journal=Am%20J%20Sci%202nd%20Ser&vvolume=20&pages=178-181&publication_year=1855
National Park Service (2017) Geology: Aeolian (Dunes) Landforms, <https://www.nps.gov/sub-jects/geology/aeolian-landforms.htm>
Ventifacts on Mars at the Pathfinder Site <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/98JE02550>

Tumble Polishing Jewelry

by Barry Edwards

fbbeadshow@gmail.com

This method of polishing jewelry involves a burnishing effect caused by the tumbling action of polished steel shot with your jewelry pieces, bringing them to a dazzling sparkle. The major benefits are:

- No dust & particles flying around the room.
- No half-polished pieces flying around the room!
- No burned, blackened fingers.
- And most importantly, requires none of your valuable time. You can sleep through the whole process if you want!

The only drawback I can figure is that you can't quite get a "mirror" finish on very large, flat surfaces. This would need a little machine buffing after the tumbling, but not nearly what you would normally have to do! You will need the following equipment:

- Rotary tumbler traditionally used for rock polishing (I use a Lortone 3A tumbler)
- Enough polished steel shot to fill the barrel half full
- Soap!

I use Ivory bar soap (grated). You can use a liquid soap, but make sure it is "99 44/100% pure soap" NOT detergent!! Check the label of your soap carefully to make sure it is not a detergent you are using. Also, most jewelry suppliers carry a burnishing compound that would also work. **Note that many people use Dawn Dish Soap in their tumblers as burnishing compound. Formulas are not the same in each country or even in each color! I have read that the blue is the best, however I've always used Ivory bar soap, and given the extra protection that the tallow in the soap gives the silver (it takes AGES for my silver jewelry to tarnish compared to tumbling with anything else!), I'm sticking to it. Your mileage may vary!

It's very important that you make sure the piece you are going to tumble is sanded (using emery paper or boards) as smooth as possible - just as if you were about to take it to the buffing machine. If you take extra care at this point, making sure you've removed any file marks and heavy scratches, you will save lots of time after it's polished. Tumbling with steel shot will NOT remove scratches and imperfections, it will just make them shiny! Now, put the shot in the tumbler barrel. Fill with enough water to cover the shot by about 3/4 of an inch. Add one tablespoon of soap (I use an old cheese grater to shave the soap). Put your jewelry in the barrel, put the lid on tightly, plug the machine in, and then put the barrel on the machine. Leave it to rotate for 6 to 8 hours (I usually put the tumbler on just before going to bed). Remove the barrel from the tumbler, then remove the pieces from the barrel. Rinse very well with running water. That's it, you're done!! Now you can set your stones, if there are any, and you have a beautifully polished piece of jewelry

A note about putting the lid on the barrel - do NOT overtighten the top screw. The inner lid (that's the round flat part that has a rubber gasket over it and a screw sticking up) is made of thin aluminum. When you put the top lid on over the inner lid and start screwing the knob tight, the inner lid starts to flex just a little. Tighten a little and you create a good seal. If you tighten the knob too tight, the flex in the inner lid won't seal properly and the

barrel lids will pop open during the tumbling process, letting all your soap, water, shot and jewelry free to make one heck of a mess that you get to clean up. If this happens, it's not the end of the world (which is why we never put our tumblers over top of anything that will be harmed by a water leak!). Gather up all the messy stuff, rinse everything off really well and start over. You can use a magnet to collect the steel shot off the floor and from other nooks and crannies. To make sure you're not over-tightening the lid, screw the knob on finger tight (don't use all the strength you own!), then back it off just a smidge. If you're worried you have it too tight, put the whole tumbler assembly in a large rubbermaid container or clean plastic litter box. That will contain the mess until you're confident that you have the lid tightening process down pat!

At some point you may find that your silver looks dull and gray after tumbling for a length of time. This is the barrel breaking in – it doesn't usually happen right away but after a few tumbling sessions. If it should happen, remove your jewelry, rinse the shot well and return the shot to the barrel. Add enough FLAT Coke to cover the shot by about ½ an inch. Flat Coke is important so that it doesn't fizz out of control and pop your lid! Tumble with flat Coke for a couple of hours, rinse everything well, then put the shot back in the barrel with soap, tumble for a few hours. At this point, rinse one more time, add fresh soap, throw your sad looking jewelry back in with the shot and tumble for a few hours. It should come out shiny and pretty after all that. If not, repeat the procedure. It can take 2 or 3 runs with Coke to clean the barrel sufficiently.

**RMGM Promotions Presents
The Texas Mineral & Fossil Show
The Lone Star Convention &
Expo Center
Conroe, TX
July 17-19th, 2020**



**Friday - \$100 Hourly Dealer
Voucher giveaways**

**Sat. & Sun. - Mineral & Fossil
Giveaways Every Hour**

**Free Show - Free Parking
Free Rocks for Kids - Workshops
WWW.RMGMPROMOTIONS.COM**

Board of Directors Meeting Agenda

February 4, 2020

by Nancy English

X	President—Sigrid Stewart	X	Beading Maggie Manley
	1st Vice President—Mike Sommers	X	Day Light—Fred Brueckner
X	2nd Vice President—Beverly Mace	X	Gemstones & Faceting—Matt Phillips
X	Treasurer—Tatyana Kuhne	X	Lapidary & Metalsmithing—Phyllis George
	Secretary—Nancy English	X	Mineral—Steve Blyskal
	Archaeology—Nancy Engelhardt-Moore	X	Paleontology—Mike Dawkins

President Sigrid Stewart called the meeting to order at 7:42 p.m. A quorum was present. Non-voting members in attendance: Foster Kneeland, Member; Scott Singleton, Show Chair; Sarah Metsa, Publicity Chair for both HGMS and the HGMS Show

PRESIDENT’S COMMENTS

Approval of Minutes: Phyllis George moved that the January 7 Board minutes be approved. Mike Dawkins seconded the motion. The motion passed.

Treasurer Report: Tatyana Kuhne sent the Treasurer’s Report to members on February 3, 2020. Tatyana is unclear about how to handle PayPal’s charges for return of funds. The club is charged \$20.00 if someone petitions PayPal for a refund. We agreed that HGMS will cover these charges for now.

Tatyana asked for a class sign-up sheet—initialed by attendees—to be used in the future to help her balance payments with her financial records. She also raised a question about the Reimbursement Form for class supplies submitted by a teacher. The Board viewed the receipts submitted for reimbursement and authorized them.

Tatyana would like someone to work with her on the categories for the financials.

COMMITTEE REPORTS

BBG Editor: Phyllis George moved and Beverly Mace seconded that the Board authorize training by Lauren Blyskal for Sharon Thomas to improve the layout for the Backbender’s Gazette. The Board approved eight hours total training. Sharon also will receive advice on working with graphics from the head of the Graphics Department at LoneStar College where she teaches.

President Stewart suggested that perhaps the BBG might move toward being distributed in the electronic version only. Sharon noted the need to keep the print version out of respect for those who do not like to read their news via a computer.

Education Committee: The Board had a long discussion on the problems of registration, tracking students, students who cancel classes, or who agree to take different ones. Maggie Manley will also receive training on the HGMS Web site so that she can post classes.

HGMS Wire Wrap-In - Sunday, February 9 from 2 PM to 4 PM. This two-hour open session is a great place for wire wrappers of all skill levels to work on an existing project or to start a new one, especially with Valentine’s Day just around the corner! HGMS wire wrapping instructor Joy Lester will be on hand to offer advice and tips, and participants are encouraged to interact with fellow artisans. You may bring your own materials/project or, for a \$15 donation to HGMS, you can receive a cabochon and up to five (5) total feet of medium-tempered (half-hard) brass square and/or half-round wire (available in 21 or 22 gauge; additional wire is \$1 per foot). **Note: This is not a class. No instruction or tools**

will be provided. Please bring your own tools. All proceeds from the Wire Wrap-In will be donated to the Houston Gem & Mineral Society and put toward the purchase of new tools and equipment for future HGMS classes.

Tatyana Kuhne reported concerns about possible copyright violations for people using a copied pattern for beading. Sigrid said she believes it is only a violation if we publish that design, but promised to look into it.

HGMS Classes

Several new classes (listed below) have been posted on the HGMS Web site at <https://hgms.org/education/classes/>. Details of each class are posted there. Members who wish to participate must register and prepay through the Web site. Go to **Classes** and click on the appropriate class. Once posted, click the Pay tab and process your payment. If payment is accepted, you are registered for the class. If the class is full, the system will not accept a payment. If you have additional questions, please email classes@hgms.org.

- Beginning Silversmithing—February 4, 6, 11, 13 and 18 (This class is FULL)
- Beginning Wire-wrapped Pendant—Sunday February 16 from 1 PM to 4 PM
- Wax Carving & Casting—March 3, 5, 10, 12 and 17
- (New) Welding Basics for Women—Sunday March 22 from 9 AM to 2 PM (no previous experience needed)
- (New) Wax Carving & Casting—May 5, 7, 12, 14 and 19 (Tues and Thurs 7 PM to 10 PM) (no previous experience needed)

Scholarship Committee: Sigrid sent a Thank You letter to Douglas Dodds for his generous donation to the 2020 HGMS Scholarship Fund.

Web site Committee: Scott Singleton reported that the Web Site Committee met for the first time in months. (It functions as a publicity committee until it is time to work on the Show). Sharon Thomas and Maggie Manley also attended. Sharon asked for feedback on her plans for the BBG. Maggie voiced her concerns about class registrations.

Show Committee: Scott Singleton discussed the financials for the 2019 Show, and attributed the increase in walk-ins through the front door to the influence of social media. Phyllis George moved and Steve Blyskal seconded to approve the Show Budget for 2020. The motion passed.

Publicity: Sarah Metsa discussed some of her plans for increased publicity. HGMS now has an Instagram and a Pinterest site.

SECTION REPORTS

Archaeology Section: Thursday, 7:30 p.m., February 6, 2020—Instead of the normal meeting day and time, the Section will have a special event on Saturday, February 8 at 10 AM. Please join us for a guided tour of the HMNS Special Exhibit **Stonehenge: Ancient Mysteries and Modern Discoveries** led by Dr. Dirk Van Tuerenhout, HMNS Curator of Anthropology. You will learn about the fascinating people behind the stones dating back 5,000+ years and encounter 300 original artifacts. For more information and to make a reservation, please contact Nancy Engelhardt-Moore at Archaeology@HGMS.org. **SPACE IS LIMITED!** We hope you can join us.

Beading Section: Saturday, 1:30 p.m., February 15, 2020 Maggie Manley will teach how to fabricate little bead people. Kits are available for \$5.00 each for this 3.5" figure. You must register in advance by e-mailing Maggie at: classes@HGMS.org.

Day Light Section: Wednesday, 1:00 p.m., February 5, 2020. This class/demonstration is focused on etching with various acids or salts and either using the piece produced from the etching as an end product or as a die to be re-used. We also will cover using everyday objects to create texture and learn the proper use of the rolling mill. Participants also will learn how to use the metal shears, to anneal copper, and to transfer texture using dies by utilizing the mill. Copper will be provided to be textured which can be used as elements

in jewelry. If you would like to texture silver, feel free to bring your own silver sheet. The cost for those who want to participate in the session is \$5.00. Please email Nancy Searle (nancysearle21@gmail.com) to register for the session.

Gemstones and Faceting Section: Wednesday, 6:30, p.m., February 12, 2020, February will be a review of Gem Cut Studio, a C.A.D. (computer-aided design) Program for gem cutting, which will be led by John Lee.

Lapidary and Silversmithing Section: Monday, 7:30 p.m., February 17, 2020—Tony Lucci will build on silversmithing skills introduced at the last meeting.

Mineral Section: Wednesday, 7:30 p.m., February 19, 2020 Tucson News—Watch a DVD of the 2019 Tucson Show.

Paleo Section: Tuesday, 7:30 p.m., February 18, 2020 Paleo Book sales – Neal Immega took over the book sales in 2005, and this year he reached \$20,000 in cumulative sales. Neal will show Mazon Creek fossils, plus a giveaway of opened and unopened nodules.

Youth Section: Saturday, 10:00 a.m. to Noon, February 15, March 7, March 21, 2020 making cabochons.

OLD BUSINESS

Building Issues:

Tony Lucci has already begun repairing the sagging ceiling tiles in the classroom.

New batteries are needed for the solar light under the parking lot door hood

The filters in the shop have not yet been changed.

Sigrid will talk to an electrician about installing exhaust fans in the restrooms and in the Metalsmithing Lab.

Tony Lucci reported material washing out from the roof drains. President Stewart said the roofers told her to expect debris to wash down from the roof repair.

A tech specialist from Lee Thompson Air Conditioning told President Stewart to put vents in the doors of the libraries to facilitate circulation.

Time to look at a new air conditioner for the shop area.

Perhaps replace the carpeting, and the hot water heater.

NEW BUSINESS

Shop News: Silversmithing Workshop - Saturday February 8 from 1 PM to 5 PM

This is not an instructional class. It is an open shop opportunity for members with silversmithing experience to work on their projects in the shop.

Bring your own projects, tools, and supplies. The Shop has limited tools for members to use in the classroom. Usual \$2.00 per hour fees apply. Mary Ann Mitscherling, HGMS Shop Supervisor

ALAA - American Lands Access Assn. Shirley Leeson contacted Phyllis George to ask her to gain the support of HGMS to rejoin the ALAA. "We truly need you all now, more than ever. I finally have the ear of a congressman from Arizona who came to our meeting there last week, and he said he'd help us." Phyllis asked for the price of the membership rate for a club and how many years can one pay for at a time. The Board decided that when we have that information, we will (if possible) pay for five years of membership.

Dunn SW requests that we dispose of cigarettes in a container designed to extinguish them and prevent fires.

The next Board of Directors meeting will be Tuesday, 7:30 p.m. March 3, 2020.

The next General Meeting will be Tuesday, 7:30 p.m. February 25, 2020. Maggie Manley will present the History of Beading.

Adjourn: Tatyana Kuhne moved to adjourn. Matt Phillips seconded the motion, and it passed. The meeting adjourned at 9:45 pm.

General Meeting Agenda

January 28, 2020

by Nancy English

President Sigrid Stewart called the meeting to order at 7:30. She welcomed thirty-five attendees. Fran and Ed Marintsch renewed their memberships after a few years of absence. Katherine Grazer is a new member. She has volunteered for the HMNS booth at the HGMS Annual Shows. James Agbasiele came as a guest with intentions to join. He brought a number of rough gemstones from Africa: aquamarine, tourmaline, amethyst, some garnets, and sapphire samples. During the break, he sold many of them to attending members.

President's Comments

Silent Auction was not available this month. It will return at the February 25 meeting.

Great Holiday Party: President Stewart thanked all the volunteers for setting up and taking down the tables at the Unitarian Fellowship Hall for the HGMS Holiday Party. She gave more Thank-Yous for the outstanding potluck food, decorations, donations for the auction, and friendly conversation.

Approval of Minutes: Phyllis George moved to approve the minutes of the November 29, 2020 General meeting as posted in the December 2020 BBG. Ray Kizer seconded the motion, and it passed.

Section/Committee Reports

In the interest of time, President Stewart asked members to look for reports of future Section meetings and presentations in the BBG, on the Web site <https://hgms.org>, or by reading the weekly e-blast from Jim Kendall. If you are a member and not on Jim Kendall's e mail list, please contact him at kendallja@att.net.

President Stewart invited other Section Chairs and Standing Committee Chairs to make any additional announcements.

BBG Editor: Our new editor, Sharon Thomas, asked everyone to send her pictures and videos of their projects so she can put them in the electronic or the hard copy version of the BBG (or in both).

Old Business

President Stewart asked members to look for the progress of Old Business items in the Board of Directors' Meeting Minutes in the latest BBG.

Classes: More classes are scheduled for February and March.

- Beginning Silversmithing—February 4, 6, 11, 13 and 18 (This class is FULL)
- Well done
- Beginning Wire-wrapped Pendant—Sunday February 16 from 1 PM to 4 PM
- Wax Carving & Casting—March 3, 5, 10, 12 and 17

Building Issues: The **Roof Repair** is finished. It is time to start planning for the **Shop air conditioner**. The **carpet** in the main hall is showing wear. President Stewart said the BOD will look for the appropriate replacement.

New Business

The Clear Lake Gem & Mineral Society Annual Show is Saturday, February 22, 10:00 to 6:00 and Sunday February 23, 10:00 to 5:00. CLGMS has asked for help with demonstration tables. The HGMS 2020 Show quarter page ad will be ready for CLGMS Show. We will need volunteers for both days to man the HGMS tables. Volunteers will promote the HGMS 2020 Annual Show and the HGMS in general.

Silversmithing Workshop—Saturdays 1:00 to 5:00

This is not an instructional class. It is an open shop opportunity for members with silversmithing experience to work on their projects in the shop. Bring your own projects, tools, and supplies. The Shop has limited tools for members to use in the classroom. Usual \$2.00

per hour fees apply. HGMS Shop Supervisor, Mary Ann Mitscherling, and Theresa Phillips will be available for supervision.

The next Board of Directors meeting will be Tuesday, February 4, 2020, 7:30 p.m.

The next General Meeting will be Tuesday, February 25, 2020 7:30 p.m. Maggie Manley will present the **History of Beading**.

Show-n-Tell: Jack Opatrany brought Opals with lovely fire. **Chris Peak** showed petrified snakewood. **James Agbasiele** displayed Ethiopian opals, tourmaline, and aquamarine rough.

Drawing: Ken Bruneau won the **agate slab**.

Refreshments: Maggie Manley brought the refreshments for tonight. President Stewart reminded everyone to **FEED THE KITTY**.

Next month's refreshments will be brought by Neal Immega. President Stewart explained that the refreshments will be reimbursed up to \$25.00.

Adjourn: Neal Immega moved to adjourn the meeting. John Mitscherling seconded the motion, and it passed. The meeting adjourned at 8:00 p.m.

After a 15-minute refreshment break, **Vice President Sommers introduced Dr. Neal Immega and his Program: Copper Agates of Michigan**—Continuing Neal's theme of Weird Stuff, he presented Copper in Agate from Michigan. Neal displayed Mike Sommers' and Ray Kizer's copper agates. Steve Blyskal also brought his specimen of copper in agate. As a special treat, Paul Brandes attended; he has done scientific work on the Michigan area site. Another treat, Chris Peek (HGMS member who migrated to Maine), brought Indonesian copper agates for sale.

Board of Directors Meeting Minutes

March 3, 2020

by Nancy English

X	President—Sigrid Stewart	X	Beading Maggie Manley
X	1st Vice President—Mike Sommers	X	Day Light—Fred Brueckner
X	2nd Vice President—Beverly Mace		Gemstones & Faceting—Matt Phillips
	Treasurer—Tatyana Kuhne	X	Lapidary & Metalsmithing—Phyllis George
X	Secretary—Nancy English	X	Mineral—Steve Blyskal
X	Archaeology—Nancy Engelhardt-Moore	X	Paleontology—Mike Dawkins

President Sigrid Stewart called the meeting to order at 7:37 p.m. A quorum was present. Two non-voting members were in attendance: Scott Singleton—Show Chairman, and Foster Kneeland—member.

PRESIDENT'S COMMENTS

We will need to monitor the coronavirus (COVID-19) situation. If there are active cases in Houston at the time of the next General Meeting, we may want to cancel.

Approval of Minutes: The Board will approve the minutes of the February 4, 2020 BOD meeting at the April 7 BOD meeting.

Treasurer Report: Tatyana Kuhne sent the treasurer's report to members March 1, 2020.

COMMITTEE REPORTS

BBG Editor: Sigrid Stewart asked, "Will the new BBG accept letters to the editor?"

There was lots of discussion on that petrified wood article. Nothing stirs up interest like controversy." Nancy agreed to ask Sharon Thomas if that would be possible. Nancy also

suggested that a picture of Pyrite Pete, the HGMS BBG mascot, be used on the cover of the new BBGs. (3/14/2020: Phyllis George emailed the image to Sharon Thomas.)

Education Committee: Maggie Manley will receive training on the HGMS Web site so that she can post classes.

*Joy Lester has three classes scheduled. Joy's March and May classes have been cancelled due to the COVID 19 Virus. The June class is still on the schedule.

Wire-Wrapped Bird Nest Ring Saturday, March 28th, 2020 - 1:00 PM to 3:00 PM

\$25.00 (Includes all materials & tools)

Beginning Wire-Wrap a Cabochon Pendant: Sunday, May 17, 2020 - 1:00 PM to 4:00 PM. Includes all materials and tools. No previous experience needed. \$45.00

Beginning Wire-Wrap a Cabochon Pendant: Sunday, June 14, 2020 1:00 PM to 4:00 PM Includes all materials and tools. No previous experience needed. \$45.00

Tony Lucci has three courses of classes scheduled.

Wax Carving & Casting—March 3, 5, 10, 12, 17: Tuesdays and Thursdays 7:00 to 10:00 p.m.

(New) Welding Basics for Women—Sunday, March 22 from 9:00 a.m. to 2:00 p.m.

Wax Carving & Casting—May 5, 7, 12, 14, 19 Tuesdays and Thursdays 7:00 to 10:00 p.m.

Scholarship Committee: Mike Sommers

1. Mike has reached out to last year's winner to ask for any updates/news on her progress, interests, field trips, etc. related to her education. If he receives a response, he will put it into our newsletter.
2. Mike spoke to several people at the CLGMS about their scholarship program. They don't do anything markedly different than we are doing in terms of process, but they do more posting on social media. They had ten applicants last year. CLGMS awards three \$2,000 scholarships a year. They have an award presentation, posing winners with a giant check for photos.
3. Mike Sommers spoke with Pat Harris, Associate Professor at Sam Houston State. Pat will encourage a couple of his promising students to apply this year. Pat Harris thinks that students from state or community colleges who transfer to 4-year colleges are demotivated to apply. More "well known" colleges and universities get preference with similar or lesser grades because students attend a "tougher" school. His term for that was "grade inflation." Meaning a B grade at, e.g., Texas Tech was worth more than a B or maybe even an A at Sam Houston.
4. Mike reviewed our application on the HGMS Web site, and he believes it does not need any further modification. He will begin sending out emails to the college contacts this month—two months earlier than during the past two years, and a month earlier than in 2017. To do so, he needs a PDF of the current HGMS Show flyer. He would also like photographs to make a four-picture montage to post on social media along with the scholarship notice (that possibly could be used to dress up the HGMS Web page). The montage should have pictures representing something Texas geology-related—a Texas fossil specimen, a Texas mineral specimen, and a Texas lapidary piece like plume or another West Texas agate.

5. Mike will speak to Sarah Metsa about putting an HGMS Scholarship ad on the HGMS Instagram page.

Trade Show Committee: Following discussions at the Clear Lake Show with some members of the HGMS Trade Show Committee, Scott Singleton decided the Trade Show Committee should get together for a meeting. A date for the meeting will be arranged next week.

Web Site Committee: The Web Site Committee met Saturday, March 7, so no updates will be available until the April Board meeting. The Committee will be updating the dealer

dates, designing Instagram ads, and updating scholarship forms.

SECTION REPORTS

Archaeology Section: Thursday, 7:30 p.m., March 5, 2020. “The Invention of Rope and the Roots of Western Civilization,” presented by Christopher Kilgore. Chris will demonstrate horsehair rope making, a nearly extinct craft he learned from retired cowhand and author, the late Bill Brett. Curious about the origin of the process, he traced its beginnings to the Cro-Magnon culture of Ice Age Europe some 17,000 years ago. Based on his analysis of cave paintings and ancient engravings, Chris came to believe that the invention of rope likely served as the major catalyst of the Paleolithic Cultural Explosion, a seemingly spontaneous flourishing of art, technology, and material culture. As such, rope manufacturing may have been the single most important technological innovation within the last million years. Attendees will receive a piece of handmade horsehair cordage as a souvenir. Please join us!

Beading Section: Saturday, 1:30 p.m., March 21, 2020. Kim Fuselier will provide instruction on creating a leather wrap bracelet using super duo beads with a button closure. Kim will send out further instruction and a material list to those registered to the Beading Group. Feel free to attend this group, as all are welcome. To be added to the e-mail notification list, contact classes@HGMS.org. The date is March 21 from 1:30 PM to 3:30 PM at the HGMS clubhouse.

Day Light Section: Wednesday, 1:00 p.m., March 4, 2020. Gretchen Cockerill will be teaching us how to make some beautiful yard art involving teacups.

Gemstones and Faceting Section: Wednesday, 6:30 p.m., March 11, 2020. The March meeting will be an overview of the gem identification tools and techniques we studied over the last year. We will follow this up with a future Saturday meeting of a gem identification practical session.

Lapidary and Silversmithing Section: Monday, 7:30 p.m., March 16, 2020. Repairing cracks in cabochons using epoxy and the vacuum chamber.

Mineral Section: Wednesday, 7:30 p.m., March 18, 2020. Garnets! The garnet group in general, with many examples. The how and why garnets are different.

Paleo Section: Tuesday, 7:30 p.m., March 17, 2020. Turtles—Neal has gallons of Pleistocene turtle shell pieces, and we will see if we can assemble a complete shell. George Wolf collected the turtle shell in Florida. Please bring any modern turtle shell you have found for us to use as an example.

Youth Section: Saturday, 10:00 a.m. to Noon, March 7 and 21, 2020. Making cabochons. A suggestion was made to start a Planetary Section. Discussion was postponed.

OLD BUSINESS

Clear Lake Gem & Mineral Society Annual Show: Nancy English thanked the HGMS Volunteers who manned the HGMS Information Table at the CLGMS Show. These dedicated members promoted the HGMS Annual November Show and the Club Sections, classes and Club shops. Clyde McMeans and Scott Singleton set up and took down the displays. Clyde, Scott, and Joel Ramirez worked all weekend. Other shifts were covered by Beverly Mace, Sandy Cline, and Douglas Dodds.

Building Issues: Results of last month's list

1. Tony Lucci has repaired the sagging ceiling tiles in the classroom.
2. New batteries are needed for the solar light under the parking lot door hood. Would anyone like to take ownership of this? If not, Sigrid will have someone look at it.
3. The filters in the shop have not yet been changed.
4. Sigrid has chosen someone to install exhaust fans in the restrooms and in the Metalsmithing Lab. He will come look at the job site this week.
5. A tech specialist from Lee Thompson Air Conditioning told President Stewart that

we need to put larger vents into the doors of the libraries to facilitate circulation. Kris Dingfield may take care of this. If the doors come off to put in the vents, maybe we can re-stain them, too.

6. Time to look at a new air conditioner for the shop area.

7. We should replace the carpeting and the hot water heater.

8. A flowerpot with sand in it will satisfy the need for an outdoor cigarette disposal requested by Dunn Southwest.

Shop News:

1. Neal Immega fixed the rattling noises in the Highland Park 24" Saw on the back wall of the shop. He replaced the key on the pulley that fitted onto the shaft that drives the saw blade. And he replaced the cover on the capacitor.

2. Safety Tip: It is okay to rearrange the magnetic lights for the grinding machines. Be careful not to drape the wires over the grinding machines.

3. Steel Shot Tumbler: When members finishing fishing their work out of the shot tumbler do not pour the green liquid down the drain.

NEW BUSINESS

Donor Company letter: Sigrid was contacted by Dan, co-founder of ALMA. ALMA is a new, quickly growing donation platform. They have simple profiles for all nonprofits in the U.S., based on information from the IRS, Guidestar, and social media. The Board agreed not to **accept their offer.**

List of Experts: Clyde McMeans suggested that a list of people willing to provide information, answer questions, and help with projects would be helpful to those of us who interact with the public and members. Often those staffing our HGMS tables/booth are asked for references. Usually it is for contact information of someone to cut and polish material or to complete a beading- or lapidary-type project. If it is a rock, mineral, gem, fossil, or artifact ID question, then someone is always around to answer those questions. At this last CLGMS show, Clyde witnessed Scott Singleton doing complete Geology 101s for several folks who came by with a simple "what's this?" rock or photograph in hand. And it is always an entertaining diversion to light up some lady's big engagement/wedding ring rock with a UV light. Some diamonds fluoresce blue!

Steve Blyskal also does a lot of geological education.

A list should be made of the HGMS members available to do projects—perhaps for a fee. Nancy English currently just forwards these show requests to Neal, and he does the rest. RMGM Texas Mineral and Show April 24, 25, 26 in Conroe: Nancy English volunteered to contact the event producer and work out a way to get the names this year. This Show has been postponed due to the COVID 19 Virus.

The next Board of Directors meeting will be Tuesday, 7:30 p.m. April 7, 2020.

The next General Meeting will be Tuesday, 7:30 p.m., March 24, 2020. Mike Sommers will speak on "Pyrite." Many examples will be shown!

Adjourn: Nancy English moved to adjourn. Phyllis George seconded the motion, and it passed. The meeting adjourned at 9:40 p.m.



WHILE WE'RE AT HOME, HERE'S SOME GREAT WEBSITES!

Archaeology

Maya <https://www.sciencemag.org/news/2020/02/astounding-new-finds-suggest-ancient-empire-may-be-hiding-plain-sight>

Dinosaurs

American Museum of Natural Science – Titanosaur <https://www.amnh.org/exhibitions/permanent/orientation-center/the-titanosaur>

Dino DNA ? <https://newatlas.com/science/dinosaur-dna-proteins-fossils/>

Everything Dino – Teaching aides <https://blog.everythingdinosaur.co.uk/blog/archives/category/dinosaur-and-prehistoric-animal-news-stories>

Giant Fossil armadillos <https://www.dailymail.co.uk/sciencetech/article-8038783/Shells-20-000-year-old-armadillos-size-Volkswagen-Beetles-Argentina.html>

Fossils

Fossil Amber <https://www.nytimes.com/2020/03/11/science/amber-myanmar-paleontologists.html>

Fossil Plant Gum <https://www.sciencedaily.com/releases/2020/02/200225075111.htm>

Gems

10 of the World's Rarest Gemstones <https://www.mentalfloss.com/article/86772/10-worlds-rarest-gemstones>

Russian Yellow Diamond <https://www.dia-designs.com/alrosa-unearths-a-colorful-surprise-at-its-new-diamond-mine-in-yakutia-russia/>

Minerals

Mineral Never Before Seen in Nature <https://www.sciencealert.com/mineral-never-seen-in-nature-found-buried-in-heart-of-mysterious-meteorite>

New Mineral Discovery Techniques <https://www.wired.com/story/geologists-discover-specks-new-minerals-earths-extremes/>

Mineral from South African Diamond <https://www.livescience.com/new-mineral-discovered-in-diamond.html>

National Geographic <https://www.nationalgeographic.com/science/earth/inside-the-earth/minerals-gems/>

Chrysoberyl <https://www.geologyin.com/2020/03/chrysoberyl-one-of-worlds-most-exotic.html>

Museums

University of Delaware <https://library.udel.edu/special/collections/mineralogical-museum/>

Recommended Websites

Science Daily Paleontology News https://www.sciencedaily.com/news/fossils_ruins/paleontology/

Science Daily – Dinosaurs https://www.sciencedaily.com/news/fossils_ruins/dinosaurs/

Science Daily – Geology https://www.sciencedaily.com/news/earth_climate/geology/

New York Times – Fossils <https://www.nytimes.com/topic/subject/fossils>

Phys.org – Archaeology and Fossils <https://phys.org/science-news/archaeology-fossils/>

Archaeology News <https://www.archaeology.org/news>

Videos

Nathan Gandara https://www.youtube.com/results?search_query=Nathan+Gandara

West Texas Plume Agate <https://www.youtube.com/watch?v=vFzUtByLxs8>

Llanite <https://www.youtube.com/watch?v=bFfgt35tn4>

Texas Topaz <https://www.youtube.com/watch?v=5ZSyuvPfU3g>

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The Backbender's Gazette



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