PALOMAR GEM & MINERAL CLUB

VOLUME 61 - ISSUE #6
JUNE 2020

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Picnic Coordinator	Moni Waiblinger
Refreshments	Dawn Wright
Redwood Rep	Barbara Bury
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JUNE(Coronavirus) NL CONTENTS:

HAPPY BIRTHDAY to JUNE birthday people!!

From all of us to all of you:

Please stay safe, wear a mask!

WASH YOUR HANDS OFTEN!!!

NEXT MEETING: ?!?!

PGMC IS CONSIDERED "NON-ESSENTIAL" BY THE STATE OF CALIF. We are awaiting the next phase when hopefully we can restart Workshops and some club activities.

The board is preparing for the re-opening of the workshop by installing plexiglass shields at main workbench. Hand sanitizer, face shields will be available. Nobody sick will be admitted. Temps will be taken.

FINDING STARS IN QUARTZ

(submitted by Michele Shepard)

The drop of honey acts as a lens. It focuses the light from the stone to project the star onto the surface of the honey drop. Use honey because it flows slowly so the drop stays as a nice lens shape and the sugar in the honey raises the index of refraction to be closer to the quartz.

--- In LA-Rocks@yahoogroups.com, Scott Solar <scott.solar@...> wrote:
>
> Honey?
> On Apr 20, 2012 8:55 AM, "Calvin" <crabsucker@...> wrote:
>
> > **
> >
> >
> > 1) Sand a few places on your rose quartz. 220 grit is fine.
> > 2) Cool the stone in the refrigerator and put dabs of cooled honey on the
> > sanded places. The cooled honey does not flow as fast.
> > 3) On a clear day with no clouds, look for the stars on the drops of honey.
> > 4) Some drops of honey will only show a cats eye. Follow the ray to the
> > other side of the stone and look for other cats eyes. Eventually you will
> > find where separate cats eyes join and make a star.
> > 5) When you have the location of the star, grind that spot round and
> > polish it. Check the star and if it is not oriented good, then grind some
> > more.
> > 6) once it is oriented, cut the end off with a saw and finish the cab.
> >
> > --- In LA-Rocks@yahoogroups.com, "Shep" <freudonetoo@> wrote:
> > >
> > > Hi All,
> > > Collected some gemmy rose quartz a while back which I'm just getting
> > around to cabbing. I know some asterated quartz comes from this site but
> > how can I tell if my rose pieces are? And if they are, how would I orient
> > them for cabbing? I've never worked star rose quartz let alone star
> > anything so really have no idea how to work these pieces if they are,
> > indeed star roses.
> > > Thanks in advance,
> > > Shep

GOD, HOWARD HUGHES, AND I HELPED CLINT EASTWOOD MAKE A MOVIE

By: Gene Ciancanelli

In early 1971, I'm in a meeting with the officers of my employer Geothermal Resources International (GRI). They ask, **"What do you know about Mono Lake?"** (Gene) **"Not much. It's a saline lake just east of the Sierra Nevada Range."** (GRI) **"Did you know it's a caldera?"** (Gene) **"No I didn't know that. How do you know it's a caldera?"** (GRI) **"It's a round lake and calderas are round."** No one at GRI knows anything about calderas or geology. I introduced them to the word "caldera" and, at some point, I probably explained that most calderas are circular volcanic depressions, which, if young enough, could possess geothermal potential. While trying to keep a serious demeanor, I reply, **"Mono Lake might not be a caldera. It's a saline lake, with no outlet, and it's sitting in a relatively flat shallow depression. Such a lake will tend to have a circular shape."** (GRI) **"We're going to drill a geothermal well at Mono Lake. Be back here in two weeks and tell us everything you have learned about Mono Lake."** Off I go to do library research. Two weeks later, the follow-up meeting occurs. (Gene) **"Mono Lake is not a caldera. I can find no convincing reason to drill a geothermal well at the lake and do not understand why the company wants to drill here?"** Now the reason for their interest in this area is revealed. As preposterous as the next few sentences may sound, this is, as best I can recall, the exact conversation. (GRI) **"You may not realize it but Mono Lake is the largest geothermal reservoir in the world. Big Ed** (who is then, but not for long, GRI's Chairman of the Board) **had a dream where GOD told him we will find the world's largest geothermal reservoir if the company drills a well at Mono Lake."** I cannot think of a single thing to say. Completely dumbfounded, I look over to my boss JQ, who gives a slight wink and inwardly he is laughing like crazy at this latest fantasy. In JQ's mind, Mono Lake is just the latest example of his opinion that the crazier an idea is the more people want to believe it's true. Why listen to the firm's geologists when dreams can guide the company's exploration program. Thus, began the Mono Lake Project.

Mono Lake is surrounded by Federal government land, which is not yet open to geothermal leasing. However, the Los Angeles Department of Water and Power (LADWP) owns the lakebed below the water's surface and LADWP becomes a partner in the Mono Lake Project. GRI now has a lease on the land under Mono Lake. Southern California Edison Company and Getty Oil Company have a joint geothermal venture. They soon learn about GRI's Mono Lake Project. I coined a nickname for the Getty and Edison partnership as "GET-US-IN", because they are constantly leasing lands around GRI's projects. GET-US-IN makes a financial contribution to GRI and LADWP's Mono Lake well, to gain access to the well's data. Thus, the Mono Lake Project began with an oil company, two utility companies, and GRI all drilling exploration wells on an old man's dream. You would think it can't get crazier than this, but we're just getting started.

Although GRI is planning to drill a million-dollar hole in the ground, there is one problem, which they don't yet realize. The company is broke and soon seeks bankruptcy protection. GRI is now taken over by an airplane leasing company controlled by the flamboyant movie maker and airplane inventor Howard Hughes. The new management knows even less than their predecessors about the geothermal business. Howard Hughes's days as a flamboyant playboy are over. He is now reclusive old crazy paranoid Howard, sitting naked and alone in his penthouse with 4-inch fingernails and hair hanging down to his waist. The executives, who run the company, whisper the name "Mr. Hughes" as if he is a vengeful God looking down from Heaven. Now I'm working for Howard, except I call him Uncle Howie, which drives the company executives crazy.

In March, I fly from Klamath Falls, Oregon to the Los Angeles Airport's charter plane terminal for a fieldtrip. JQ, my boss, is waiting at the terminal. (JQ) **"The Hughes people want to visit the Mono Lake well site**

and they have arranged a charter flight." (Gene) **"It's March. That area will be under snow."** (JQ) **"I tried to explain that, but they want to see the area for themselves."** A big stretch limousine arrives with GRI's new officers including Fred Fishman (a.k.a. The Fish), the company's new chairman and Howard Hughes' friend. The Fish is GRI's new "sugar daddy" financial backer. These gentlemen are accompanied by their young "girlfriends". Among the rich, it seems to be the fashion for rich old men to have either a Trophy Wife or an older wife and a young girlfriend. The plane takes off for Bishop, California and the weather is turbulent flying over the Sierra Nevada Mountains. The pilot announces the plane has to fly higher and we will be using oxygen. JQ starts to light a cigarette and a girlfriend stops him saying, **"You can't smoke when we're on oxygen because of the fire danger."** (Gene) **"Boy you're right that's quick thinking."** (Girlfriend) **"I used to be a stewardess."** (Gene) **"What do you do now?"** There is a long pause as I'm looking at this blond in her mid-twenties. (Girlfriend) **"I'm retired."** (Gene) **"How can you be retired? You're younger than me."** JQ is sitting next to me and he now leans over and whispers in my ear, **"Cool it dummy. She's the president's mistress."** This mistress actually did OK for herself. She owns an apartment building in Los Angeles when the president finally replaces her. All I owned was a single-wide mobile home and empty pockets.

In Bishop, the group stops to have lunch at a local café. Inside, The Fish says, **"Oh look a lunch counter with stools. How quaint, let's eat at the counter."** The Fish is paying the bills and salaries and The Fish gets what he wants. The Fish sits at the counter as his entourage jockeys for position at his side. It looks like the Last Supper with JQ and I in the Judas' seats. The Fish orders a hamburger and in copycat sucking-up fashion everyone else orders a hamburger. The waitress gets to me and is about to add to the hamburger order. (Gene) **"What is today's special?"** (Waitress) **"There are two specials meatloaf and swordfish steak."** (Gene) **"I'll have the swordfish."** From the middle of the counter, one of the suck-up executives says, **"Gene we're all having hamburgers."** (Gene) **"That's fine, but today I didn't fly from Klamath Falls to San Francisco to Los Angles to Bishop to eat a hamburger. I need something more substantial."** Soon a highway patrolman enters and the cook asks, **"Bob did you just come down from the pass?"** (Patrolman) **"It's a real blizzard up there. We closed the highway until the storm passes and they can get the road cleared."** (The Fish) **"We're driving to Mono Lake."** (Patrolman) **"Not today. The road's closed."** After our expensive chartered luncheon flight, the limo crowd leaves JQ and me back at the Los Angeles charter terminal. JQ now tells me he has resigned and I'm the company's sole technical employee, which I will remain for the next three years. JQ advises that working for these folks will be a good learning experience and, in a few years, a better opportunity will come along.

Someone in the Hughes crowd learns about ground-noise. Ground-noise is the latest super-duper geophysical tool that is a "sure thing" for finding geothermal resources. No sooner is the word ground-noise coined and there are several geophysical consultant experts and geophysical consulting companies providing this must have service. As best I can recall, ground-noise is promoted as a micro-seismic technique that makes a long-term recording of micro-earthquake events associated with boiling water in the geothermal reservoir. The recordings are played back on a tape recorder as an audio signal. Self-appointed experts claim they can listen to these audiotapes (probably while smoking a certain type of weed) and hear the hot water boiling in geothermal reservoirs. The water in a geothermal reservoir has to be over 400° F to be an economic resource for electric power generation. The reservoir must be under pressure to constrain boiling in order to reach such a temperature. Therefore, commercial subsurface reservoirs are not boiling, but this doesn't seem to matter to anyone but me. As usual, each ground-noise survey company has their own special methods and tools that make their services and interpretations better than their competitors. Eventually, ground-noise will be discredited and the method and experts will fade away to later reappear somewhere else as experts in a new service or industry. These experts are today's equivalent of the 19th Century snake oil salesmen.

(left) I'm riding in a boat, owned by an ex-Nazi U-Boat captain, while enjoying an all-expense paid cruise to Pahoa Island in the center of Mono Lake. (right) The beach on Pahoa Island where the scenery isn't half bad.

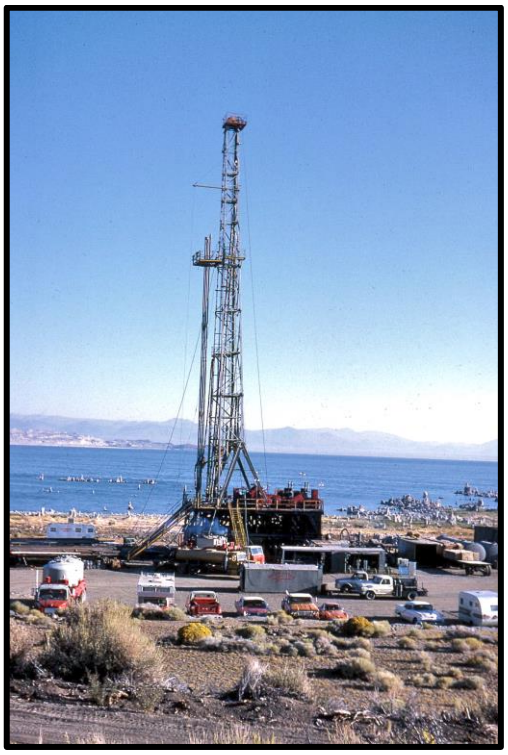
Without my knowledge or input, GRI hires consulting geophysicists to do a ground-noise survey at Mono Lake. The total cost for this one survey, that lasted only a few days, will exceed the firm's entire field geology exploration budget during the five years I'm employed by GRI. We do the survey, I say "we", because I'm assigned to help the geophysical field party, who prove to be nice fellows. Geophones and tape recorders are installed on two islands in Mono Lake. The only boats available belong to an aquarium fish food company harvesting the lake's brine shrimp. The company's owner, a retired World War II Nazi U-boat captain, is approached about renting a boat. He agrees to rent us a boat after long negotiations, which include several cases of German beer as an inducement. The field party can now sail to the islands to set up the geophysical instruments. The ground-noise survey is quickly completed and GRI receives the ground-noise report, which I don't recall other than, like most such reports, it told the company nothing except, **"we need to do more work"**. Most consulting firms write "We Need to Do More Work" reports. The more work consultants can generate, the more profit they make. GRI lacks money for another survey and that ends the firm's misadventure with ground-noise. In fact, during my five-year tenure at GRI, that is the only geophysical survey the company ever performed. The Mono Lake ground-noise survey's approval probably occurred because the firm's geologist had nothing to do with recommending the ground-noise survey.

Setting up a ground noise station on Pahoa Island.

The LADWP leases are below the water line and it is necessary to negotiate a Federal land drill-site lease on the lake's shore. The well will be directionally drilled out from the lakeshore site and the well will bottom beneath the lake. A University of California Berkeley professor suggests the companies hire him as their "environmental consultant". Otherwise, they just might encounter environmental opposition to the drilling project. This is the Hippy Era at Berkeley and this professor is dressed in hippy garb and exudes hippy hygiene. This doesn't endear him to the conservative corporate executives, who are loath to hire such a person to represent their firms. Having resisted his blatant blackmail attempt, the hippy professor begins an environmental campaign against the Mono Lake well. Press releases are issued that state a Berkeley professor is warning of the dangers associated with drilling a geothermal well at Mono Lake. Newspaper articles warn the well will deplete heat from the earth's core and destroy the earth's magnetic belt, which will allow cosmic radiation to destroy life on earth. If he were right, then active volcanos would have long ago depleted the heat from the earth's core. This argument does not seem to bother the learned experts supporting the shakedown professor. The professor organizes the local high school students to oppose geothermal development. He soon has prominent environmental groups and leftist activists involved (kind of reminiscent of today's climate change hysteria). Hearings are held to determine if a drilling permit should be issued. One rabid environmentalist lady stands up and states she doesn't use any products produced from the earth or that use energy that damages the earth. At the hearing, I inquire where she got the aluminum belt buckle and Levi jeans she is wearing and did she walk to Mono County from San Francisco. This produces loud shouting and screaming from her and her cohorts, but no answer. The politicians, as usual, are bending to the vocal opposition. The project remains in trouble until the high school graduation. The hippy professor is the commencement speaker and, to their parent's dismay, many local students are now adopting his hippy dress and drug addicted lifestyle. For the first time, drugs are being openly sold in Mono County. The professor's commencement speech urges the students to abandon their parents outmoded values and lifestyle and adopt the hippy culture of drugs, no career, and disrespect for traditional society. The parents and county officials are in the audience watching the Berkley Professor's attempt to destroy their children's lives. The professor is advised, in a

way he can't refuse, to leave the county and never return. Two days later, the County Commissioners approve the drilling permit with one negative vote. The man casting the negative vote soon approaches GRI for a job, but none is offered.

A very expensive road is constructed to the lake's south shore, where a large drilling pad is constructed. Both the road and well pad require trucking in a large quantity of gravel to form a solid base over the deep loose sand surrounding the lake. GRI doesn't pay the local contractor, who built the road and well pad. I try to convince GRI that not paying local contractors jeopardizes their ability to do future business in the area. Furthermore, if the well is a dry hole, then the road gravel will have to be removed and the entire site restored to pre-drilling conditions. This will require GRI to re-hire the local contractor for site restoration services. Eventually, I manage to get the local contractor paid, but I'm told it is company policy not to pay bills until a lawsuit is filed. That is the last time Gene will hire anyone to perform work for the company.



The 1971, Mono Lake exploration geothermal well is certainly the most beautiful drill location that I ever supervised.

In September drilling is underway. One day, a limousine drives up with the company's officers, a French photographer, and a bevy of bikini clad models. Work at the rig stops the very moment the models exit the limo. Each girl is wearing a brand-new shiny hardhat. The photographer has the girls and officers posing all over the rig. Tex, the tool pusher, is angry, because the rig hands have their eyes on the bikini girls and not on their work. In an angry voice, Tex keeps shouting, **"Somebody is going to get killed around here."** The officers, models, and rig hands ignore Tex. Soon, a Los Angeles catering truck arrives, erects tables under a shade awning, and sets out a lavish food and wine buffet for the officers and girls. Having never worked an honest day in their lives, these idiots don't have enough sense to invite the drilling hands to join the party. They're not going to dine with scum like us. The crew and I sit on the rig floor eating our sandwiches and looking down at GRI's party. If you want to give the crew the impression that you're better than they are, you can't do a better job than to flaunt a catered party, and not invite them. After the "beautiful people" finish lunch, they call the geologist scum (me), over to drive the Frenchman around to photograph the drilling rig and surrounding countryside. The Frenchman does

not speak a word of English and I speak no French. Never-the-less, in true French fashion, he succeeds in making me dislike him.

Sunny is the most popular roughneck on the crew. Here she is about to connect another section of pipe to the drill string.

During drilling operations, The Fish and his young wife came to visit the project and observe the drilling. Mr. and Mrs. Fish live in an east coast mansion with a large staff of servants. The Fish is from a very wealthy old money family. The Fish was born during the Depression and at birth an 80-million-dollar trust fund was established for him. I suppose in today's money that would be over a billion dollars. He later inherited the larger family fortune. The Fish invited Betty and I to dinner. During the meal, we could not fail to notice the wife's diamond ring, which was an oval shaped stone about 1 inch long and ½ inch wide. It more-or-less covered most of her finger. The conversation got around to children and we learned they had very young kids. Mrs. Fish said she missed her children, which were back east with their nanny. She said that she probably should not have come on the trip, because she had just hired a new upstairs maid and the maid was not yet fully trained. Then she said to Betty, **"Don't you just hate to train new staff? It's such hard work and takes so much time."** Betty agreed with her, because at that point Betty had spent almost 10 years training me to be her assistant managing our 10 by 60-foot mobile home trailer park mansion. Although clueless about how we "little people" live, Mrs. Fish seemed like a nice person, but sadly shortly afterward she died from cancer leaving her little children without their mother.

Previously, at a pre-drilling meeting, the parties asked for my geologic assessment regarding what would be encountered in the well. (Gene) **"The well will drill through about 4,000 feet of lake sediments and interbedded volcanic rocks. The bit will penetrate the basement granitic rocks at about 4,000 feet and the hole will begin to drill much slower. The bottom-hole temperature will not be hot enough to make a cup of tea."** In September, the hole drills through lake sediments and interbedded volcanic rocks down to 4,008 feet, where it enters the basement granite at a temperature of 98º F. The hole continues drilling in granite with drilling costs mounting and no increase in temperature. GRI's management "experts" are now in panic mode. At an emergency meeting, my suggestion to sacrifice a live chicken to gain God's favor receives angry stares. Perhaps, I should have suggested sacrificing a

lamb. GRI calls upon the world's foremost drilling and reservoir experts at DeGolyer and McNaughton in Dallas for their guidance. DeGolyer and McNaughton respond, **"What does Gene advise?"** (GRI) **"He has been against this project from the start. He wants to abandon the hole. He says there is nothing here."** (DeGolyer and McNaughton) **"You ought to start listening to your geologist. He is giving you some good advice."** GRI and LADWP finally abandon the Mono Lake well, but this will not deter the boys at GET-US-IN. They immediately move the rig to Mono Lake's north shore to drill another well. GET-US-IN asks me, **"Well mister smart guy, what do you predict we are going to find?"** (Gene) **"You are going to drill a deeper hole and get the same dry hole results, but you will spend a lot more money."** They drilled deeper, found nothing, and spent more. You just can't fix stupid.

The Tufa towers at Mono Lake. which is now a Federal Geology Park.

The dry hole was all my fault because, "I displeased God". In my defense, I tried to convince them the Devil was in charge of heat below the ground. Now, it will be very expensive to restore the site back to its natural state. Spectacular tufa tower rock formations are exposed along the lake's shore and the drill pad road now provides access for people to view the tufa towers. We suggest to the County Commissioners that rather than remove the road, GRI is willing to install picnic tables, trash bins, etc. to convert the site to a park. The County Commissioners welcome this idea and for less than $10,000, GRI eliminates the site restoration cost. The tufa towers park proves popular and today the drill site has grown into the Federal Bureau of Reclamation's first ever geology park with rangers, bathrooms, nature walks, and educational exhibits.

A year later, Betty and I stop by to check the park and make sure everything is in good shape and there are no problems to be fixed. To our surprise, trailers, trucks, and equipment are parked on the park's parking lot, which is the former drilling pad. No one is around, but the signs identify this as a movie company encampment. Alongside the lakeshore, there is a newly constructed town of wooden buildings, which we discover are false front buildings depicting an old west town. The following year, we're in the theater watching the new Clint Eastwood movie "High Plains Drifter, which was filmed at the drill site. In the gunfight scenes, I recognize every rock outcrop that Clint and his adversaries are hiding behind. Meanwhile, Howard is still sitting alone naked, unwashed, and unkempt in his penthouse, while I'm now working for a Canadian company.

God appeared in an old man's dream and told him to drill a well at Mono Lake. Crazy Howard Hughes financed this dream. Environmentalists warned this well would lead to the Earth's apocalyptical destruction, which is the usual outcome for all environmental warnings. A geologist reluctantly supervised this foolish project with a hard-working drilling crew. The subsequent dry hole became the staging area for a Clint Eastwood cowboy epic and later a Federal geology park. Clint Eastwood never knew he made a film with the help of God, Howard Hughes, and

Gene. At least we “little people” got a movie and a park out of what otherwise was a waste of my time, Howard’s money, and God’s forbearance.

GLACIER AND ICEBERG CALVING

By: Gene Ciancanelli

When you’re stuck at home with cabin fever, you can pass the time looking at some very exciting and interesting videos of spectacular glacial and iceberg calving in Greenland and Alaska. Climate change has speed up the calving process and some very spectacular videos have recently become available showing this process. While a video can never equal being there in person, there is the advantage that you’re not spending $10,000 to $20,000. Betty said it is also warmer and more comfortable watching at home compared to freezing for hours on a boat. I think otherwise because we have seen calving glaciers and some other neat things like a seal giving birth on an ice flow, whales, sea otters feeding and floating on their backs holding their young, bears, dolphins, eagles catching fish, and other wildlife, which are missing from these videos. It is difficult to understand the scale of these walls of calving ice and icebergs. They are hundreds of feet high. Sit back and enjoy the excitement of beautiful blue ice crashing into the sea and icebergs bobbing up and down. Copy and paste these links onto your browser and you will get hooked on watching the beauty and excitement of calving, because you’re not going anywhere.

https://www.youtube.com/watch?v=yQqbg0yItqY

https://www.youtube.com/watch?v=OxqFAwLeLNs

https://www.youtube.com/watch?v=gpseIhAapt0

https://www.youtube.com/watch?v=hC3VTgIPoGU

https://www.youtube.com/watch?v=RL3EjH9-WSs

https://www.youtube.com/watch?v=XhpNFYroo8k

https://www.youtube.com/watch?v=Arfq2PF7n2E

https://www.youtube.com/watch?v=AjTndSBHwjY

https://www.youtube.com/watch?v=v40w_LmrIK0

https://www.youtube.com/watch?v=qDIxSTqDeRs

Why does June have 3 birthstones?

The main reason why some months have multiple birthstones is because various ancient stones have become too rare, so it is less likely for them to be available on the market and to satisfy consumer needs. June's three birthstones are pearl, moonstone, and alexandrite – the only other month with three birthstones is December, with turquoise, zircon, and tanzanite.

Birthstones by Month

(for more info click on each birthstone)

January	**February**
Garnet	*Amethyst*
March	**April**
Aquamarine	*Diamond*
May	**June**
Emerald	*Pearl, Alexandrite, Moonstone*
July	**August**
Ruby	*Peridot, Spinel*
September	**October**
Sapphire	*Tourmaline, Opal*

November	December
Citrine, Topaz	*Zircon, Tanzanite, Turquoise*

Birthstones By Mohs Scale of Hardness Ranking

The Mohs Hardness Scale was developed in 1812 by Friedrich Mohs. He was a German mineralogist. In the scale, hardness defines the **mineral's resistance to being scratched**. A hardness grade of "10" signifies that a mineral is very scratch-resistant. Meanwhile, a "1" grade suggests the mineral is very prone to scratches.

A mineral gets scratches when an external object breaks its chemical bonds. The test is usually conducted by checking whether one sample of a mineral is able to visibly scratch another. The scale is ordinal. Thus, even though a **diamond is four times harder than a topaz**, their scores are 10 and 9, respectively. Despite being more than 200 years old, the scale is still widely used by geologists today.

Mineral	Grade
1. Diamond	*10*
2. Ruby, Sapphire	*9*
3. Alexandrite	*8.5*
4. Topaz	*8*
5. Aquamarine, Emerald, and Spinel	*7.5-8*
6. Zircon	*7.5*

7. Tourmaline	*7-7.5*
8. Amethyst, Citrine	*7*
9. Garnet	*6.5-7.5*
10. Peridot	*6.5-7*
11. Moonstone, Tanzanite	*6-6.5*
12. Opal	*5.5-6.5*
13. Turquoise	*5-6*
14. Pearl	*2.5-4.5*

Birthstone Meanings

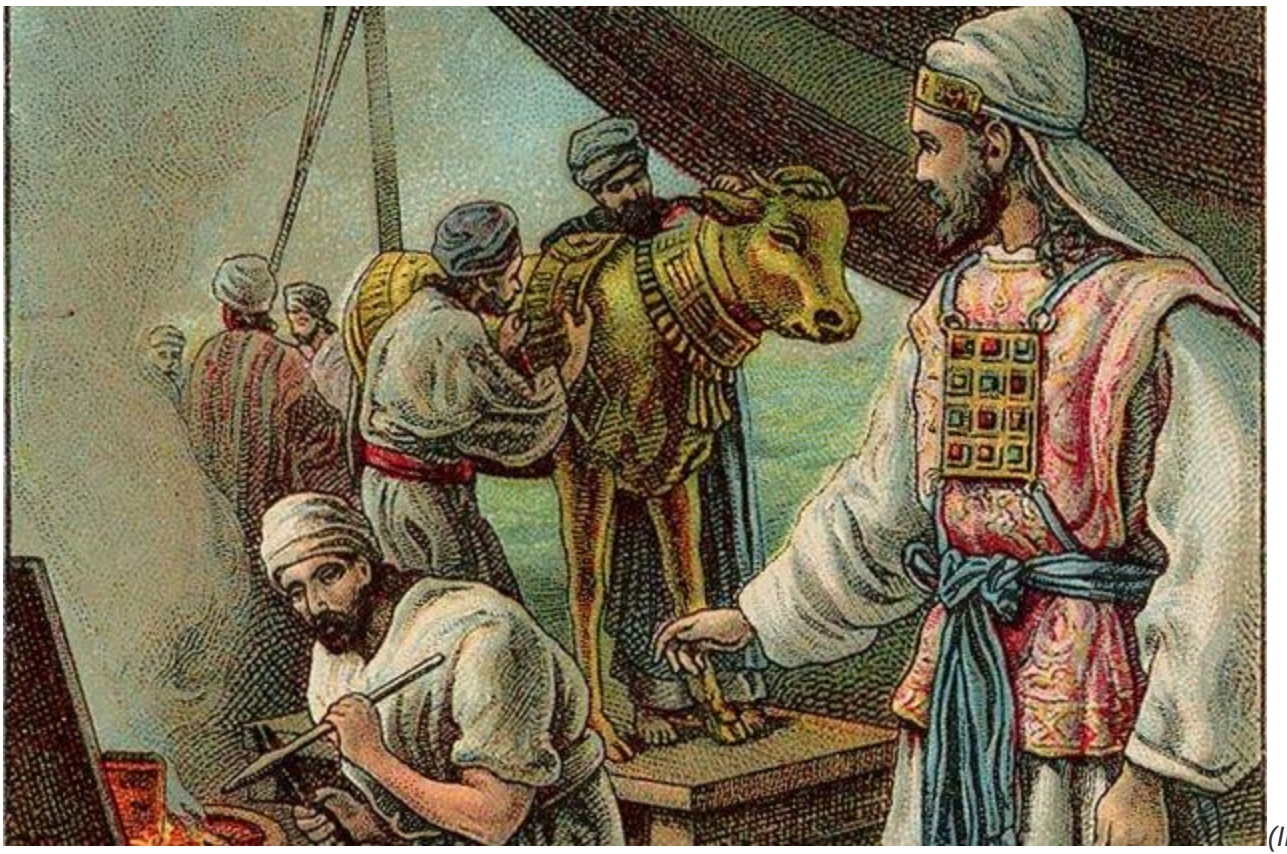
Throughout their history, birthstones have been associated with folklore. They detail **various symbolic powers and qualities**, just like zodiac signs. The belief is that by wearing your birthstone, you connect to the qualities it represents. Nowadays, many do not believe the mythical healing powers of the birthstones. But, their symbolic meaning is still valued. More generally, birthstones are considered to be a **token of good fortune** for those born in the month.

Fact: Though there are over 200 naturally occurring gemstones, only 19 of them are officially listed as birthstones.

Click to tweet

Where do Birthstones Come From?

Birthstones have been significant since ancient times. Also, their history is fascinating. To get started, we cover one extremely common question that many people have. How did the idea of birthstones first originate?



(Image Courtesy of Listverse)

The idea of birthstones has its **roots in Biblical times**. As written in the Bible, in the book of Exodus, Moses describes the ceremonial priest's garment. It was to be made for his older brother Aaron, a high priest. He gives directions to adorn the breastplate with twelve different gemstones. Thus, each symbolizing one of the twelve tribes of Israel.

"And the stones shall be with the names of the children of Israel, twelve, according to their names, like the engravings of a signet; every one with his name shall they be according to the twelve tribes." Exodus 28:21

Titus Flavius Josephus was a first-century Romano-Jewish historian. He was the first to make a connection between the twelve gemstones and the twelve zodiac signs. Later, the twelve months of the Roman calendar. For centuries, the standard practice was to have all twelve gemstones and wear them each month. Then, custom changed. Instead, only the gemstone of the month you were born had to be worn throughout the year.

Birthstones – Different Now

As to which specific gemstones were initially used as part of the twelve remains a highly debated topic. Not only are there are differences in information in various versions of the Bible, but it's also very difficult to interpret. This is mostlydue to the fact that there was **very little understanding of minerals during Biblical times**. Thus, the descriptions were often inaccurate.

Many combinations of birthstones were used until 1912. Later, the American National Jewelers' Association, put together the **first official list**. Though this list has little connection to the original set of gemstones described in the Bible, it is regarded as the most authoritative source.

Since 1912, there have been a few updates to the list. Specifically, about **June birthstones**. In the original list, pearl and moonstone were listed as the only birthstones for the month of June. In 1952, nearly a century after first being discovered, alexandrite was also added to the list. Thus, those born in June have three stunning gemstones to choose from. We will take a closer look at each of them in the next section.

6. June Birthstones – Pearl, Alexandrite, and Moonstone

June has three birthstones, all of which are beautiful in their own way. They also offer their own symbolic meaning. Pearls and moonstones have a long history linked to them, while Alexandrite is a more recently discovered gem. In fact, it has begun to get more attention in the past couple of decades.

Each gemstone comes from various locations across the globe. Pearls can come from waters in China, Japan, Australia, the Philippines, and French Polynesia. Alexandrite, on the other hand, has always been exclusive to the mountains of Russia. However, a large deposit got discovered in Brazil. The United States, Brazil, and India are some of the largest exporters of moonstones.

JEWELRY GUIDE: FRESHWATER PEARLS

Out of the five pearl types, freshwater pearls are arguably the **most popular today**, primarily because of their affordability. People also love that they're available in a **variety of incredible colors**, which each offer something different stylistically. For example:

- White pearls feature a traditional and elegant appeal.
- Pink pearls have a feminine and chic aesthetic.
- Multi-colored pearls offer a unique and modern look.

Layer different colored freshwater pearl jewelry to create a dazzling look that can add style and sophistication to any outfit.

The color of pearls depends on the color of the outer shell of the mollusk. Alexandrite features a color-changing property (that we will cover later on). It's a result of **chromium traces in the mineral**. Moonstone consists of **orthoclase, and albite**. They are stacked in alternating layers. This causes the adularescence which gives the gem its unique appearance. We describe each of these three June birthstones in-depth in the next section.

FACT: In 2012, scientists discovered a pearl in the United Arab Emirates that is believed to have originated between 5547 and 5235 BC, making it the oldest pearl ever found at nearly 7,500 years old.

Pearls

Pearls are undoubtedly **one of the earth's most unique gemstones**. They are **the only gemstones to come from a living creature**. These include mollusks such as oysters. Also, clams that come from specific oceans and rivers located in different parts of the world. Today, pearls are one of the most popular gemstones.

(Image Courtesy of Smithsonian Magazine)

The Meaning of Pearls

There are various interpretations as far as what the meaning of pearls is. That's mainly because so **many different cultures treasured and embraced the gem**. Historically, pearls **were associated with water** because of where they originate from. But, **also with the moon because of their look**. In ancient Chinese culture, people believed that **pearls brought wisdom**. Today, pearls are most commonly believed to **symbolize purity, integrity, and love**. This belief comes from the ancient Greeks. They thought that pearls were **Aphrodite's hardened tears of joy**. She is the ancient **Greek goddess of love and beauty**.

GIFT GUIDE:
TIN CUP PEARL JEWELRY

As the primary birthstone for the month of June, pearl jewelry makes a great gift for anyone born in the month. Featuring unique designs that are strung with gold, **tin cup pearl jewelry** is one of our favorite gift choices. Not only are the tin cup designs delightful and fun, but by incorporating the pearl birthstones, the gift is also extremely thoughtful.

The History of Pearls

People have treasured pearls since ancient times. In both ancient Egypt and Rome, **royalty adorned themselves with the dazzling gemstone**. Due to the **extreme rarity and high value, they were symbols of power, class, and prestige**. Though pearls continue to maintain very high levels of popularity today, they're not the exorbitantly priced gems they once were.

Natural and Cultured Pearls

For thousands of years, **all pearls were natural**. That means that they developed in nature entirely on their own. Divers would risk their lives to dive deep into waters and collect mollusks. That's despite the slim chances of actually finding a pearl. Given their extreme rarity, **natural pearls were and still continue to be expensive**. Nearly all natural pearls available on the market today are vintage pieces. This is primarily due to one development which changed the pearl industry forever.

In 1893, **Kokichi Mikimoto developed the world's first cultured, or farmed, pearl**. These cultured pearls featured the same qualities as natural pearls. Also, they had more spherical shapes that people preferred. In the years that followed, **the supply of pearls increased dramatically**. That lowered the price of the gems making them accessible by many more people. Cultured pearls were also a much more sustainable option than natural pearls. That's because the population of wild mollusks was severely depleted by that point due to overharvesting. **Today, nearly all pearls available for purchase today are cultured.**

Kokichi Mikimoto: My dream is to adorn the necks of all women around the world with pearls.

Click to tweet

How are Pearls Made?

In nature, pearls develop when **a tiny particle gets trapped inside a mollusk** completely by chance. To defend itself from this irritant, **the mollusk begins to produce and coat the particle with nacre**. It's a composite made largely from **aragonite that gives pearls their luster**. In essence, this particle acts as the nucleus of the pearl. As the mollusk continues to coat the particle with nacre, a pearl slowly begins to form. **It can take up to four years for a pearl to fully develop.**

For cultured pearls, there is one significant difference in this development. It is how the particle is first introduced. Instead of this process happening randomly, **pearl farmers deliberately insert it**. From there, the process is exactly the same as for the natural pearl.

Shapes, Colors, and Luster

Pearls come in a variety of exquisite colors that are all unique in their own way. Although **white is most commonly associated with the gemstone**, they are also available in other colors. That includes **black, pink, and even a golden hue**. And while perfectly round pearls are most popular, the gemstones also feature different shapes. Some of these are **baroque, semi-baroque, and drop-shaped**. Although baroque and semi-baroque shapes are slightly irregular, they give the gemstone a one-of-a-kind aesthetic. And more people are coming to appreciate them.

While color and shape are both important qualities of a pearl, many would say that a **pearl's luster is its defining characteristic**. As mentioned before, this luster comes from the quality of the nacre that a mollusk uses to create the pearl. The **luster is the reason why the gemstone reflects the light** in such a way as though if it's glowing from the inside.

The color, shape, and luster-quality of a pearl all depend on the type of pearl, which we discuss in the next section.

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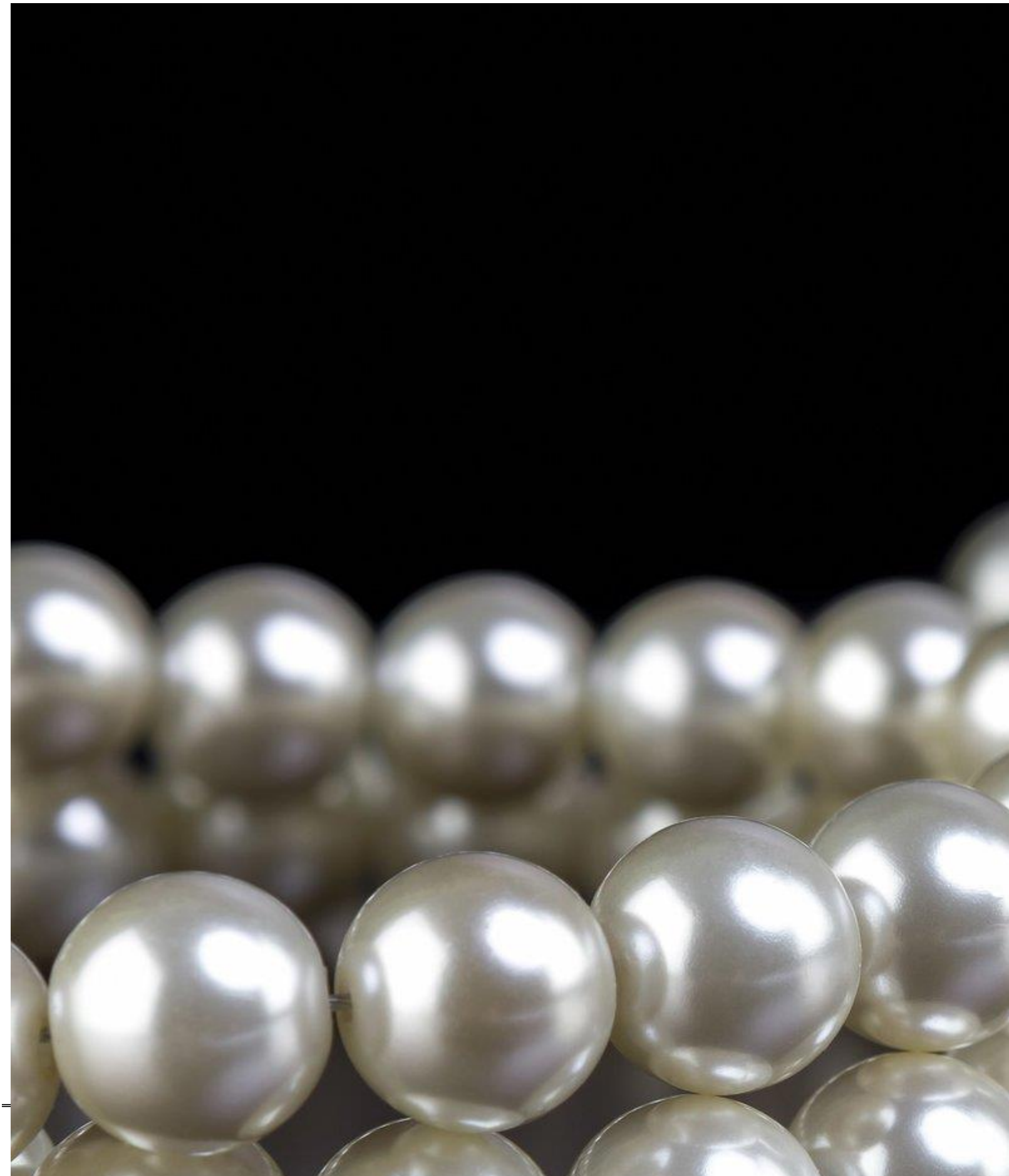


(Image Courtesy of Quiet Curator)

Types of Pearls

There are four pearl types: **Freshwater, Akoya, Handama, Tahitian, and South Sea**. Each features distinct characteristics that vary in the qualities we discussed above. Also, in size and value. Additionally, they all come from different geographic locations.

Freshwater Pearls: Found in **lakes and rivers in China**. Freshwater pearls are one of the most popular types of pearls. This is because of their reasonable price-points. Despite their affordability, they maintain a **high level of quality**. Especially in recent years with advances in Freshwater pearl cultivation. From **white to pink, cream, and lavender**, Freshwater pearls come in a wide variety of stunning colors.

Akoya Pearls: Japanese Akoya pearls were **one of the first types of pearls to get cultivated**. They have since become a distinguished pearl type revered around the world. Not only do they feature **perfectly spherical shapes**, but also v**ery high luster**. A white Akoya pearl necklace is considered one of the most classic and timeless pieces of jewelry that money can buy.

Tahitian Pearls: Despite their name, Tahitian pearls don't only come from Tahiti. Instead, you can find them on the coast of many islands that make up **French Polynesia**. These pearls are unlike any other. And this is primarily due to their breathtaking colors. **Most notable is their irresistible black hue**. But, others include a **peacock green, silver blue, and eggplant**.

South Sea Pearls: There are two variations of South Sea pearls: **white and golden**. White South Sea pearls are found on the coast of **Australia**. Meanwhile, Golden South Sea pearls come from the **Philippines**. Both feature pearls that are **larger than any of the other types**. They're perfect for someone looking for a set of bold, lavish pearls.

JEWELRY SPOTLIGHT:
PEARL NECKLACES

What is the perfect piece of jewelry? They need to be able to take any outfit to the next level, and work with a variety of different colors and styles. Pearl necklaces do just that. As one of the most iconic pieces of jewelry, they provide the perfect touch of class, refinement, and shine. There's no doubt **a pearl necklace is something every woman should have in their jewelry box.**

Moonstone

Moonstone, an **incredibly luminous gemstone**. It's the second birthstone for the month of June. Though they are not quite as popular as pearls, many would argue that they're just as beautiful.

The History of Moonstone

Moonstones come from the **feldspar mineral group**, which makes up a good portion of the earth's crust. As a result, there are many different geographical locations where they're found. That includes the **United States, Brazil, India, and Armenia**, to name a few. They've been adorned by people for thousands of years. The stone has been prevalent in ancient Roman, Greek, and Hindu cultures. These gems were especially particular during the **Art Nouveau era between 1890 and 1910**. Jewelers in this period made frequent use of the gemstone to decorate jewelry.

(Image Courtesy of Crystal Cave)

The Adularescence of Moonstones

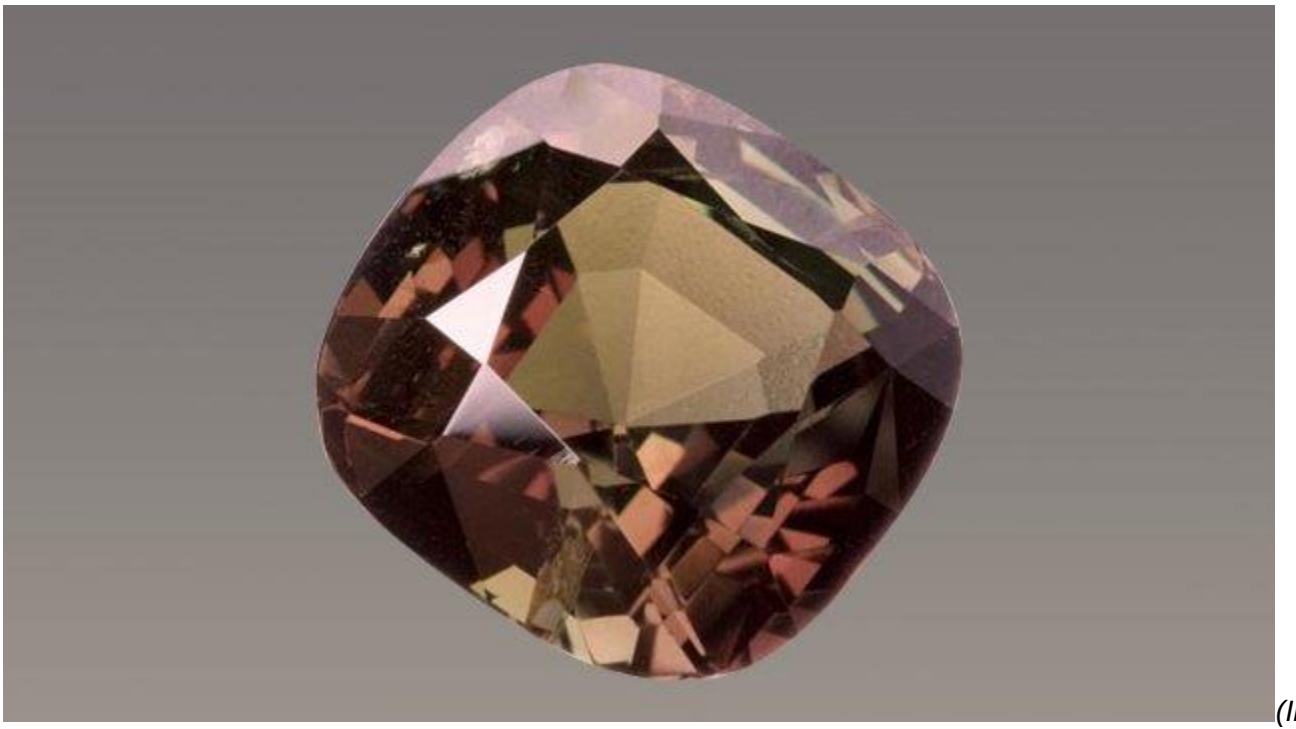
The most striking quality of moonstones is their adularescence, or schiller, as it's often referred to as. As light strikes a moonstone, the internal structure of the gem makes the light scatter. It gives the **same visual effect as when clouds are lit up by the moon**. This is where the name of the moonstone originates from. In fact, in many ancient cultures, the gemstone was thought to had been created from moonbeams.

The Meaning of Moonstone

The serene beauty of this gemstone is where its meaning comes from. Especially the **soothing aesthetic of the moon**. Historically, the gem has been a **talisman for the soul and spirit**. Moonstones have a

feminine energy that **brings inner-peace, tranquility, and balance**. The captivating appearance of the gem is indicative of this symbolism. Thus, making it easy to understand and embrace its meaning.

Alexandrite



(Image Courtesy of GIA)

The third of the June birthstones was **discovered in 1830 by Finnish mineralogist Nils Gustaf Nordenskiöld**. He initially believed that the gemstone was emerald. However, two distinguishing factors made him realize that he had found a new gem. One was that this stone was a lot harder than emeralds. Next was the way the stone **changed color under light.**

It was originally named diaphanite by Nordenskiöld. But, it didn't last long. The stone came from Russia's Ural Mountains—the only place in the world it was found at the time. With sole access to this gemstone, Russia's royalty stepped in and named the newly discovered gem **Alexandrite**. It's after the country's future leader, **Tsar Alexander II**.

When Alexandrite **was added to the list of June birthstones in 1952**, Russia was still the only place of source. And by that point, the supply was extremely depleted. It wasn't until thirty years later when other deposits of Alexandrite were found in I**ndia, Burma, and Brazil**. Despite this new supply, Alexandrite is still considered **extremely rare**. Thus, it is one of the world's most expensive gemstones.

The Gemstone's Unique Ability to Change Colors

It shifts colors under different sources of light—what is sometimes called the **"Alexandrite effect."** When viewed in daylight, the color varies from a bluish-green to a yellow-green. Under incandescent light, the color ranges from a pink hue to a crimson red. As the saying goes, **"emerald by day, ruby by night."**

The scientific explanation for this color-change is as follows. Under different lighting conditions, **the gemstone absorbs specific wavelengths of the spectrum and reflects others**. This is due to traces of chromium found in the gemstone. It results in strong absorption of yellow and green. In daylight where there is plenty of green light, the gemstone reflects this light back out. However, in artificial light, there isn't a large source of green light. As a result, the gem instead reflects the red rays that the light source contains.

The Meaning of Alexandrite

Since Alexandrite doesn't have an ancient history as the case with the other two June birthstones, there isn't as much lore tied to it. That said, since its discovery, people have come to associate the stone with a few meanings. As a birthstone, **the gem inspires creativity and the imagination**. It is also **symbolic of hope and optimism**. Thus, reminding us that each type of light brings a new beauty to life that should never be taken for granted.