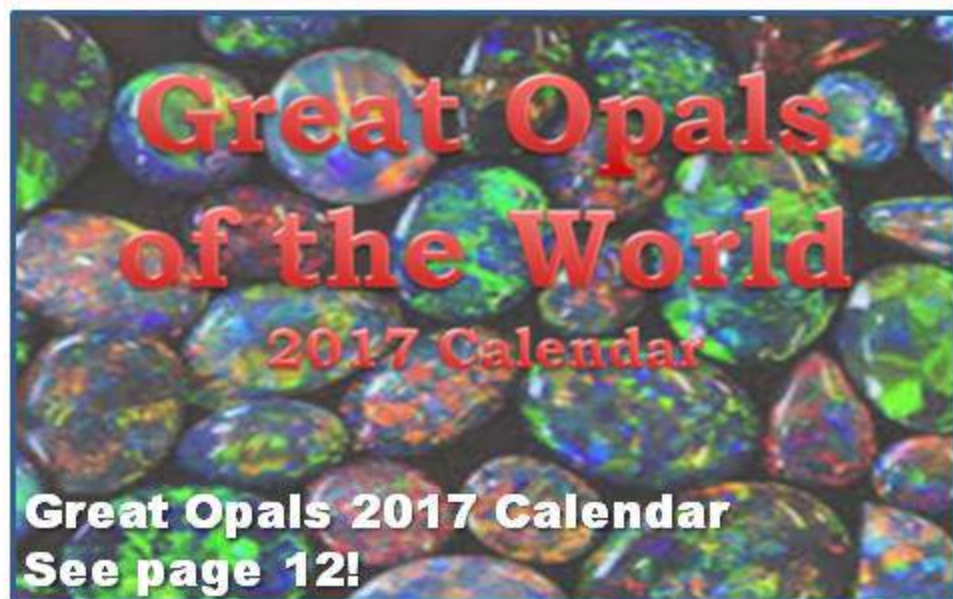


The **BULLETIN**

OF THE NEW YORK MINERALOGICAL CLUB, INC



Volume 130 No. 10
October 2016

**OPAL BANQUET
INFORMATION**

**GEMSTONE
ORIGINS**

VANADIUM

SILENT AUCTION

**SYNTHETIC
METEORITES**

**MEMBERSHIP
RENEWAL FORM**



October 19, 2016
*Opal Banquet
of the NYMC*

America's Oldest Gem & Mineral Club

Founded 1886



Incorporated 1937

Bulletin of the New York Mineralogical Club

Founded 1886 ♦ New York City, New York ♦ Incorporated 1937
America's Oldest Mineral & Gem Club

Volume 130, No. 10

October 2016

October 19th Event:
Annual Banquet with Silent Auction, Special Lecture, Gifts, Games, Awards & Surprises!
Preview of the evening's program:

Social Hour & Reception
6:00 p.m. – 7:00 p.m.

Silent Auction
6:00 p.m. – 7:00 p.m.

Dinner, Drinks & Dessert
7:00 p.m. - 8:30 p.m.

Some Entertainment & Fun & Games
"Opal Locality Game"



New York Mineralogical Club Meeting
8:30 p.m. - 11:00 p.m.

Banquet Dedications
Jerrine Anthony
Mel Belsky
Larry Conklin

Announcements & Awards
Silent Auction Results
2017 Membership Cards
NYMC Enthusiasm Awards
NYMC Certificates of Appreciation
Marco Polo Award
Bulletin Article Contest Awards
Special Opal Note Cards
Upcoming NYMC Events
Additional Announcements

Presentation of Gifts to Members
Including Special Door Prize

Lecture by
V. Gornitz, A. Schumate & M. Portnoy
"The Sparkle of Opal"

Thanks & Acknowledgments

Final Words & Adjournment

Three-Part Opal Lecture Featured at 2016 Banquet

By Mitch Portnoy

The 2016 Banquet of the New York Mineralogical Club will occur on Wednesday evening, October 19th at the Holiday Inn Midtown Manhattan.

The evening's theme is "The Sparkle of Opal".

With this theme in play at this gala event you will be treated to a lecture by three members of the club: (1) Vivien Gornitz will focus on the mineralogy and geology of opal, (2) Anna Schumate will explore some contemporary topics relating to opal and (3) I will give a brief overview of the art and folklore of opal usage in global cultures.

The opal theme was chosen by the Club's Planning Committee in July 2015 because it seemed to be the only "great and powerful" gemstone that had never been focused upon at meeting or banquet.

Past banquet themes have included diamond (2011), tanzanite (2012), jade (2013), ruby (2014), and most recently, garnet (2015). The use of a gemstone theme and its most common color association helps tremendously in the overall party planning and design. (And for next year's banquet we are probably going to have an amethyst-related theme so I imagine you can guess what the major color theme will be!)

Once the theme was selected, Vivien, Anna and I were asked to collaborate in the creation of an opal lecture in the same way as we had done in 2013 with our jade lecture. Given the great success of that joint effort, we eagerly agreed!

The three of us have been working together on this talk for many months and we continue to polish it. I can promise you

that this opal presentation will be both an educational experience as well as an iridescent (and opalescent) feast for the eyes!

Here's a fun suggestion: wear clothing, accessories or jewelry that relate to opal!

If you want to add some opal to your personal collection, a section of the silent auction will contain opal-related books, specimens, jewelry, lapidary art, etc.

All attendees will be given a souvenir folder containing information and artwork about opal as well as an opal-themed 2017 NYMC wall calendar.

More party ideas and surprises will surely make this a fun evening for all! A reservation form is on page 12 of this bulletin

I hope to see many of you at this year's banquet!



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President's Message

By Mitch Portnoy



- ◆ I hope to see many of you at this year's banquet! A reservation form is on page 10 in this bulletin (and you can also renew your Club membership for 2017 on that form).
- ◆ And speaking of membership renewal, you can now use PayPal on the NYMC Website for that function!
- ◆ We thank Dr. Scerri for providing the idea for a new NYMC graphic using one of the newly named elements!

7 N Nitrogen	39 Y Yttrium	115 Mc Moscovium
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The much anticipated supplement to the Mineralogical Record entitled *Mineral Collections in the American Northeast* arrived on August 1, 2016. It features many of the collections of NYMC friends and members (both current and past) including:

Russell Behnke, John Betts, Steve Chamberlain, Robert Martinchek, Herb Obodda, Alla Priceman, Daniel Record, Carolyn Reynard, Daniel Trinchillo, and James Zigras.

Several "relevant" institutions are included in the supplement as well:

American Museum of Natural History, Franklin Mineral Museum, and the Sterling Hill Mining Museum.

Club Meeting Minutes for September 14, 2016

By Vivien Gornitz, *Secretary*

Attendance: 49

President Mitch Portnoy presided

Announcements:

- ◆ The monthly raffle was held.
- ◆ September 21st marks the beginning of the Club's 130th year of existence!
- ◆ A website update was given on the PayPal integration and a FAQ section.
- ◆ The club's directors have added a July meeting to the 2017 calendar.
- ◆ Renée Newman's and Dr. Eric Scerri's new books were presented.
- ◆ As is now standard for a meeting, the day's historical events were shown.
- ◆ A video (Periodic Table of NYC Trash) was played.

- ◆ The first Mohs' Hardness (1-2) game was played with prizes of minerals with those hardnesses.
- ◆ Details about the 2016 AFMS Bulletin Article Contest were given.
- ◆ Extensive 2016 Opal Banquet details were discussed.
- ◆ Upcoming Club events thru December 2017 were gone over quickly.

Special Lecture: Eric Rampello – "Mineral Collection Building Tips & Strategies"

Eric Rampello, a young and enthusiastic Club member, offered some helpful tips for novice and seasoned collectors alike. He started his collection with a less than perfect aquamarine crystal, which served as his "introductory rock"—a relatively inexpensive study piece that he examined carefully, getting to know its color, clarity, and crystalline features. Gaining experience, he realized that regardless of the reasons for collecting minerals, certain points should be kept in mind when adding to a collection.

The first is that of price. Especially when considering an expensive piece, one can always ask the dealer whether there is "wiggle room", i.e., is the price negotiable? If there is a "net price", the price is set—no bargaining. Maybe one has to settle for a commercial grade piece—one of average quality—but does the specimen have any interesting or unusual features? Some collectors like old labels, which may drive up the price especially if the piece came from a museum or belonged to a well-known collector.

Size is another consideration, especially for New York City apartments. Eric favors easily-stored thumbnails or "miniatures", actually hand size specimens. Larger cabinet and decorator size specimens may enhance your home but escalate in price dramatically. Some examples of thumbnails from Eric's collection include a bi-color Mt. Apatite tourmaline and a malachite on cuprite from Namibia. Also from Namibia is hyalite opal on aquamarine and schorl.

Condition is another thing to look for. Check for signs of damage. A "ding"—chip or scratch—may be acceptable if it's small and inconspicuous when displayed. Avoid dings near a crystal termination. Natural etch marks or depressions left by the imprint of another crystal, no longer present, don't really count as damage, but should not detract from the overall appearance of the piece.

Quality, color, and rarity are factors to consider when buying gemmy crystals. The portion of a crystal that is transparent, inclusion-free, with good color counts as "facet grade." "Cutting rough" can be fashioned into lesser-quality faceted gemstones or cabochons. "Specimen grade" features attractive crystals, not quite gemmy enough for jewelry, but yet great as minerals to be added to your collection. Look for attractive color, preferably a saturated hue, with some transparency, and good crystal formation. Also aim for rarity—in location, crystal habit, unusual features such as twinning,

phantoms, or growth peculiarities. Good examples from classic localities also enhance a collection, such as a bright pinkish-red rhodochrosite from the Sweet Home Mine, Colorado. Some of Eric's rarities include a trapiche tourmaline from Zambia, a "sixling" cyclic twin from Brazil, tri-colored scepter tourmaline from Nepal, and sphero-cobaltite (formerly called cobaltian calcite) from the Congo.

The presentation ended with Eric's parting words: "Keep collecting and rock on!"

Welcome New Members!

Richard & Paulette Wasserman NYC, NY

Members in the News

- ◆ **Naomi Sarna** was the winner of three 2016 AGTA Spectrum Awards:

Business/Day Wear - Gem Diva Award
18K palladium white gold "Confetti Heart" ring featuring multicolored diamonds, sapphires, rubies and amethysts.



Carving - 1st Place

Hand-Carved Ametrine (297 ctw)

Carving - Honorable Mention

- ◆ **Otis Kidwell Burger** had an article featured on the Villager.com entitled *My life and the changing Village: Part II*.
- ◆ **Vivien Gornitz** was a speaker at the North American Symposium on Climate Change Adaptation held August 16-18, 2016 at Columbia University.
- ◆ **Anne Pizzorusso**, our November lecturer, was a featured speaker at the European Mineralogical Conference held in Rimini, Italy in September 2016.

The 2016 Rodman Paul Award was presented to the Hauck Family (Elna & **Dick Hauck**, Elizabeth & Bob Hauck) of Franklin, New Jersey during the July Mining History Association meeting.

In November: Mohs Game



The World of Minerals

The *World of Minerals* is a monthly column written by Dr. Vivien Gornitz on timely and interesting topics related to geology, gemology, mineralogy, mineral history, etc.

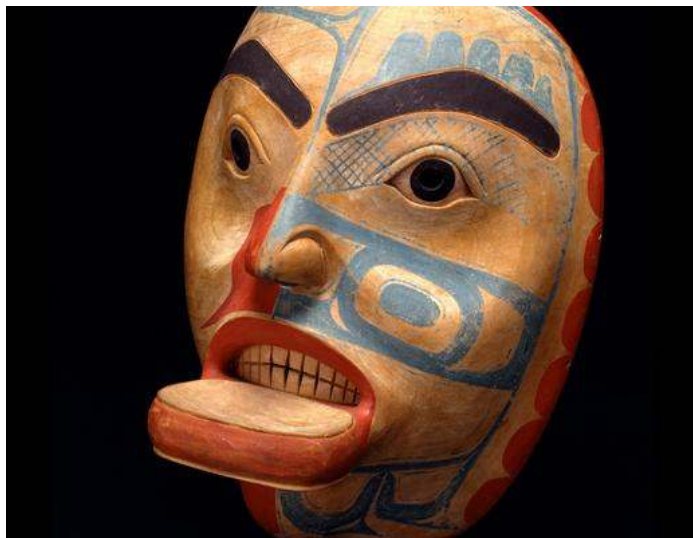


Unusual Mineral Pigments in Native Northwest Coast Art

The art of the Northwest Coast Indians is world-famous for its towering totem poles, brightly colored carved masks, house posts, boxes, and other objects, generally made from cedar wood. The art conforms to a highly stylized, formal system characterized by “formlines” that outline blocks or segments of the overall design. This tradition goes back several thousand years, although it has evolved over time, and is still in use by contemporary Native artists. The use of color also follows strict conventions. The primary formlines are usually outlined by black lines that can vary in thickness. Secondary fields are outlined in red, as are design elements within the primary blocks. Designs in the remaining spaces are either left unpainted, exposing the original wood background, or are painted either blue or green.



While the nature of the black and red pigments is known (generally charcoal for the black, red ochre for the red), the composition of the blue and green colors has not been conclusively identified until recently. Until now, the blue and green pigments were thought to be some copper derivatives, but analysis with a scanning electron microscope showed that the green pigment is the mineral celadonite, $K(Mg,Fe^{2+})Fe^{3+}(Si_4O_{10})(OH)_2$, while the blue one is vivianite, an iron phosphate hydrate. A study of many objects with blue-green pigments revealed that they were vivianite, primarily found on Tlingit shaman's paraphernalia, ceremonial, carved helmets, or ritual pieces. Blue was also reserved for tribal nobility. Among the Haida, blue could be used for any kind of artefacts. Haida and Tlingit are two northern Northwest Coast native groups that live in British Columbia and southern Alaska, respectively).



Vivianite, an iron phosphate hydrate, undergoes a color change from colorless, when pure and fresh, but rapidly oxidizes to a darker green-blue, when exposed to light. (The iron originally, ferrous iron, Fe^{2+} , oxidizes to a mix of ferrous and ferric iron, Fe^{3+} , and alters to a slightly different degree of hydration). Pigments were simply mixed with water and an organic binder, and proved to be quite durable. Shamans probably favored vivianite because of its changeable nature. This would fit in neatly with their concepts of transformation (or their presumed ability, when in trance, or as they would put it—in the spirit world—to transform from human to animal, or from one beast to another). Both minerals were used as pigments by the southern Northwest Coast peoples, who were less strict about their art conventions.

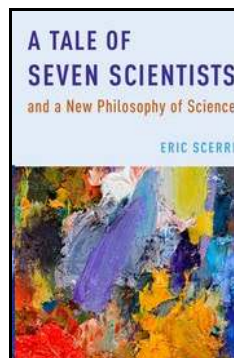
Further Reading

Ancheta, M., 2016. Coloring the Native Northwest Coast. *National Museum of the American Indian Magazine*, Spring 2016, p. 14-19.

<http://www.mindat.org> Vivianite, see also link to Alfredo Petrov.

Now Available!

A Tale of Seven Scientists and a New Philosophy of Science By Dr. Eric Scerri



- ◆ Presents a completely original philosophy of science in the grand tradition
- ◆ Scerri proposes an evolutionary as well as organic view of the development of science
- ◆ Brings to light several lesser-known figures in 20th century science
- ◆ Illustrates how even incorrect theories can lead to scientific progress

Determining Gemstone Country of Origin

By Anna Schumate

At a recent meeting of the Manhattan Chapter of the GIA Alumni Association, GIA researchers Riccardo Befi and Akhil Sehgal presented an overview of the processes involved in country of origin determination for ruby, sapphire, emerald, spinel, tourmaline and other important gemstones.



The first adventurous step in this process involves a field trip to collect samples of the gem at its source, most often a remote mine site in a difficult terrain. Hiking through jungles, rock climbing and wading through slippery, rocky streams carrying equipment demands physical stamina. Field work involves more than a little bit of danger in entering mines with varying states of technology. Some of these sites are quite primitive.

Planning an expedition involves:

- ◆ Researching the literature on the chosen location along with maps and geological and climate information
- ◆ Selecting the best season for the local climate. Inhospitable weather like monsoon floods can prevent access to sites.
- ◆ Selecting team members with the “right stuff.” Compatibility is a must!
- ◆ Arranging for transportation, lodging and food,
- ◆ Hiring local guides and drivers.
- ◆ Assembling and transporting all equipment needed for field gemology, GPS, maps and other equipment
- ◆ Obtaining permits and insuring cooperation from local government and mining officials. Sharing information and results with local people earns trust and eases this cooperative effort.



Dr. Edward J. Gübelin (1913-2005)

When the samples are collected and everyone is safely back in the laboratory, the specimens need careful preparation. “Windows” are polished in 2 places on the gem crystals, after carefully orienting them, so that each one will be viewed in the

same crystallographic direction. These specimens and the data collected from their study are added to the extensive GIA collection and database. Incidentally, the GIA obtained the Gübelin collection of more than 2,000 gems along with slides and reference files after his death. In addition to reference and comparison with this immense database, an array of laboratory instrumentation measures the optical and chemical properties of these samples and also the gems that clients submit for country of origin reports.

Identification of inclusions and measuring trace element chemistry are the two most important parts of determining country of origin. After microscopic examination and photomicrography, various advanced instruments play their part in analyzing optical and chemical properties.

The following instruments test optical properties:

- ◆ A **visible spectrophotometer** shines a narrow beam of light through the gem by scanning through a series of wavelengths, beginning at the blue end of the spectrum through to the red end. Wavelengths not absorbed by the sample are transmitted to the instrument’s detector. The transmitted light is seen by our eyes as the gem’s hue. The results of this analysis are shown as a graph that shows the relative transmission (or absorption) of light versus wavelength. Researchers use the information to determine the chromophore or cause of the color.



Sample Visible Spectrophotometer

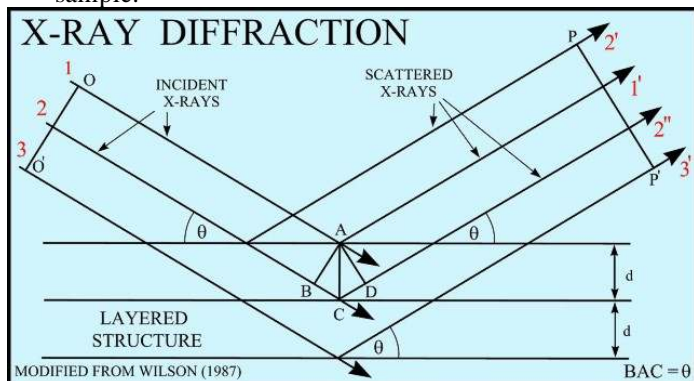
- ◆ The **infrared spectrometer** measures the invisible light spectrum, known as infrared. Infrared spectra can help the researcher determine if a gem has been treated, or whether it is a type I or type II diamond. This instrument generates radiation at wavelengths beyond the red end of the spectrum where “light” is invisible to the eye but can be felt as heat. These wavelengths can be absorbed, transmitted or reflected by the sample being analyzed. Materials such as resin, oil, plastic and other substances used for the treatment of colored gemstones have distinct features in their infrared spectra and can be detected by the spectrometer.
- ◆ An **infrared microscope** makes it possible for a researcher to create a map of how the infrared spectra change across the surface area of the gem.
- ◆ The **Raman Spectrometer** uses a laser to illuminate the sample and record its Raman spectrum that can help researchers identify a gem or mineral specimen. The results, which consist of sharp peaks on a graph, are examined and compared to known spectrum library of different kinds of gem materials. The instrument can also be used to record emission spectra of samples using a technique called

photoluminescence (or PL) spectroscopy (in which the light from the laser causes the sample to emit energy at specific wavelengths to create a luminescence spectrum).



Sample Raman Spectrometer

- ♦ **X-ray diffraction** makes it possible to examine the gemstone at the atomic level. Researchers use this information to determine its chemical structure and identify the material. The x-ray diffractor system analyzes the crystal structure of a sample by illuminating a powdered sample with a beam of X-rays. The X-ray beam is diffracted, or bent, at specific angles depending upon the atomic structure of the crystal. Researchers compare the results with a standard database of specific angle patterns from known materials. This method destroys a small sample of the gem, but can provide a positive means of identifying the material. Chemical analysis determines the elements that comprise the gem and if it is natural, synthetic or has been treated.
- ♦ **X-ray fluorescence (XRF)** identifies the chemical elements in a gem. By illuminating the sample with energy from an X-ray source, this system records the emission of X-rays of particular energies characteristic of the chemical elements present in the gem. The instrument performs a rapid, nondestructive, qualitative chemical analysis of samples that have a large, flat polished facet. This technique can quickly tell the researcher what chemical elements are present in the sample.



- ♦ **Laser-Ablation, Inductively Coupled Plasma, Mass Spectrometer (LAICPMS)**

This sophisticated instrument determines how much of each element is present in the sample. A beam of light from a laser is focused on the surface of a sample and it ablates, or removes, tiny particles from the surface. These particles are

moved by a flowing gas into a high-temperature laser torch where they are broken down so that the individual atoms that can be identified by the detector. This makes it possible for the researcher to make a quantitative chemical analysis of the naturally occurring elements, even down to low concentrations in the sample. A very small part of the sample, usually smaller in diameter than that of a human hair, is destroyed in the process.



Sample Mass Spectrometer with Laser Ablation (**LAICPMS**)

Finally, *imaging* adds to the database of gemological research.

- ♦ **Photomicrography**, offers researchers a way to capture close-up images of features or inclusions within the gem. Researchers use this information to determine the circumstances around how the gem formed and, for some gems, where it originated. A binocular *photomicroscope* is used to capture photographic images of the features, or inclusions, in a gem.



A binocular photomicroscope is used to capture photographic images of the features, or inclusions, in a gem. Researchers use this information to help identify a gem's origin.

Although the laboratory cannot always give a definitive country of origin for some gem specimens, this ever-increasing body of knowledge has made identifying the country of origin for the majority of the world's most important gem stones a valued service to the gem and jewelry industry.

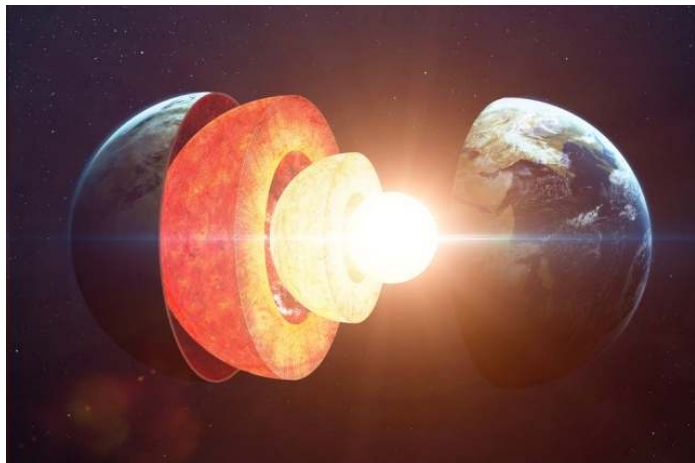
References

- Presentation by GIA researchers Riccardo Befi and Akhil Sehgal, April 19, 2016.
- Mogok Expedition Series Part 1: The Valley of Rubies, Andrew Lucas and Vincent Pardieu, www.GIA.edu, March 20, 2014.
- Mogok Expedition Series Part 3: The Market and the Stones, Andrew Lucas and Vincent Pardieu, www.GIA.edu, May 20, 2014.
- Scientific Instruments Help Researchers Tell Gem Stories, www.GIA.edu 2016.

Earth's Core Is Two Years Younger than its Crust Thanks to Relativity

By Alfredo Carpineti

Relativity is one of those fascinating branches of physics whose consequences might seem a bit illogical when compared to everyday life, like the twin paradox. Now, another quirk of relativity has been revealed: due to gravity, Earth's core is younger than the crust.



Ulrik Uggerhøj from Aarhus University in Denmark and his colleagues used both a very simple approach and then a more sophisticated one to work out the effect the accumulated action of gravity has on the different layers of our planet. They found, in the more accurate model, that the crust is about 2.49 years older than the core, reported New Scientist.

According to the principles of general relativity, the stronger the gravity field is, the slower time will move. If we had two clocks, one near the center of the Earth and one on the surface, the first one will appear to tick more slowly than the second one. This research shows that the core clock loses 0.3 nanoseconds for each second it passes.

Uggerhøj decided to investigate the difference while writing an undergraduate book on physics. He wanted to include a quote by Richard Feynman about the effects of gravity, on how the "the center of the earth should be a day or two younger than the surface." This number has often been quoted, even by Uggerhøj, but in writing the book he wanted to also include a calculation, and that's when he noticed the discrepancy.

The researchers started with a model in which Earth is a perfect sphere with the same density everywhere. The formulas used, although borrowed from general relativity, are simple enough to be followed by most high school students. They can be seen in the team's paper on arXiv. The simplest scenario indicates that the center is 1.58 years younger the surface.

To produce a more precise estimate for the crust-core age difference, the team used a more realistic density distribution. The Earth becomes denser towards the center but not linearly, so geologists have different models to describe the interior of our planet.

In their paper the team used the Preliminary Reference Earth Model, a one-dimensional model used to work out where the different layers separate. The realistic model needs a more complex mathematical calculation, but the answer was still easily obtained. The team stated that this is a purely physical calculation and only take into account the elapsed time from Earth's formation.

The researchers applied these calculations to the Sun as well. They worked out, based on a realistic model called Model S, that the core of the Sun is 39,000 years younger than its surface.

This work also highlights the need to always double check calculations. Uggerhøj states how many physicists, including himself, have just assumed the calculations were correct but somebody, either Feynman or the transcriber, must have switched years for days.

The authors believe this is very important from an educational point of view. In the paper, they write: "Realising that even geniuses make mistakes may make the scientist more inclined towards critically examining any postulate on his/her own."

Source: IFLScience.com from April 27, 2016

San Andreas Fault Is "Locked, Loaded And Ready To Go," Says Leading Seismologist

By Robin Andrews



An aerial view of a segment of the San Andreas fault. Carol M Highsmith/Buyenlarge/Getty Images

Southern California's section of the immense San Andreas Fault is building towards a catastrophic rupture. At the opening of the National Earthquake Conference in Long Beach, Thomas Jordan, director of the Southern California Earthquake Center (SCEC), said that "the springs on the San Andreas system have been wound very, very tight. And the southern San Andreas fault, in particular, looks like it's locked, loaded and ready to go."

Based on the movement of the tectonic plates in the region, earthquakes should be relieving roughly 4.9 meters (16 feet) of stress every century. As reported by the Los Angeles Times, the San Andreas fault hasn't been doing this at all, meaning that over a 100 years' worth of stress is waiting to be unleashed.

The last time the southern section of the fault ruptured was in 1857, when a stretch of 360 kilometers (225 miles) fractured at the surface, causing a magnitude 7.9 earthquake that lasted for three entire minutes. Although there are constant, small tremors, major stretches of it have refused to budge. One section, near the Salton Sea, hasn't experienced a huge event since the late 17th century.

A magnitude 7.8 quake in 1906 killed 3,000 people in San Francisco, and was one of the most powerful of the 20th century. Although this released a lot of stress, this was in the northern section of the fault line, and the southern section hasn't experienced anything like this since.

Luckily, San Andreas doesn't lie directly beneath Los Angeles; however, this city of 3.9 million people is only 48 kilometers (30 miles) away from it, and it will certainly be affected by the next "Big One." Unfortunately, pinning down when the next cataclysmic earthquake will happen is, as always, proving difficult.

As far as we know, there are no precursors or warning signs to quakes; the best scientists can do is to say where they will happen, and if a large amount of time has passed since the last tremor, it's likely that the next will be particularly powerful. The longer nothing happens, the worse it will be when it does.

In any case, it's not just the San Andreas fault that seismologists are concerned about: Fault systems are complex and interconnected, and what happens to one fault affects the others attached to it.

For example, beneath California lies the San Jacinto fault. Although comparatively small, there's compelling evidence that in the past its rupture has triggered its larger companion to also jut forwards. These "double-fault" quakes are not necessarily more powerful than single ruptures, but they do show how small earthquakes can trigger larger ones.

If one kickstarted San Andreas into causing a magnitude 7.5 earthquake, it would unleash 1,000 Hiroshima atomic bombs' worth of energy in the blink of an eye. Frighteningly, things could be even worse: The SCEC ran a supercomputer simulation in 2010 to simulate a magnitude 8.0 quake on the region, and it revealed that the entire Los Angeles basin would be hit extremely hard, with major casualties and hundreds of billions of dollars of damage a near certainty.

Jordan concluded that the best course of action is to batten down the hatches: If California's infrastructure isn't reinforced and designed to resist a magnitude 8.0 tremor, then thousands of people will die, and the city may not be suitable to live in for many months afterwards.

Source: IFLScience.com from May 5, 2016

Vanadium: The "Beautiful Metal" That Stores Energy

By Helena I. Gomes & Helen Abigail Baxter

An unheralded metal could become a crucial part of the renewables revolution. Vanadium is used in new batteries which can store large amounts of energy almost indefinitely, perfect for remote wind or solar farms. And what's more there is loads of the stuff simply lying around in industrial dumps.

Don't let the dumpster diving put you off – never mind gold or silver, vanadium may just be the most beautiful metal of all. It's the 22nd most abundant element in the Earth's crust, though it's rarely found naturally in its metallic form. Instead, vanadium can be found in more than 100 different minerals.

Once extracted and dissolved in water, various forms of vanadium turn into bright, bold colours. It's even named after "Vanadis", the old Norse name for the Scandinavian goddess of beauty, Freyja.

Vanadium is not only beautiful, but also strong. Adding small percentages of it creates exceptionally light, tough and more resilient steel alloys. Henry Ford was the first to use it on an industrial scale, in the 1908 Model T car chassis, and today the vast majority of vanadium is used in structural steel, mainly to build bridges and buildings.

Vanadium Flow Batteries

The unique properties of vanadium make it ideal for a new type of batteries that may revolutionise energy systems in the near future – redox flow batteries.



Vanadinite from Morocco

Batteries store energy and generate electricity by a reaction between two different materials – typically solid zinc and manganese. In flow batteries, these materials are liquid and have different electric charges. Both are pumped into a "cell" where the electric current is generated. A tiny membrane separates the two liquids, so they are able to react but don't come into direct contact.

Vanadium is used in these batteries as it can convert back and forth from its various different states, which can carry different positive charges. As only one material is used, the risk of cross contamination is eliminated. The liquids have an indefinite life, so the replacement costs are low and there are no waste disposal problems. Also, the battery is extended to a potentially infinite lifetime.

In flow batteries, the energy production and capacity are independent. Energy is stored in tanks, whereas the capacity depends only on the amount of liquid stored. This provides a great design flexibility that other batteries do not allow. They are also safer, as the two liquids don't mix causing a sudden release of energy. Even President Obama is impressed.



Colors of vanadium. Steffen Kristensen

The New Energy Reservoir

Vanadium flow batteries are too big and heavy to replace the lithium batteries found in your phone, however. These batteries are instead used for large stationary long-term energy storage, or to supply remote areas, or provide backup power. They're the basis for a more efficient, reliable, and cleaner electrical energy market.

Energy storage is one of the main factors limiting the spread of renewables. When solar and wind power is produced at the wrong time of day we need to store it to use it during the evening demand peaks. Studies have shown that vanadium batteries can be a sustainable solution.

When we can create huge stores of energy to access as required, we will be liberated from the need to maintain rapidly-accessible energy generation such as coal or gas. Vanadium batteries can be a reservoir of energy much in the same way as we use actual reservoirs to store rainwater for later use.

The ability to store electricity would reduce reliance on gas and coal. In turn this would increase fuel security and cut CO₂ emissions, helping to meet agreed emissions targets. No wonder then that the EU considers vanadium a critical metal for strategic energy technologies.

The Hunt for Vanadium

The metal is mined, and supplies are currently dominated by China, South Africa, Russia and the US. Vanadium has a medium risk of supply shortage and a high political risk.

However, as vanadium can be a byproduct of other sorts of mining, about 70% of the vanadium above ground is unused, left in industrial wastes such as mine tailings, debris or steel slags. In fact, a study I published with colleagues last year estimated that 43% of the annual global production of vanadium could be recovered from alkaline wastes, such as steel slag, red mud, fly ashes from coal energy production, and construction and demolition waste.

But there isn't yet a firmly established technology to recover this vanadium. Certain bacteria and fungi can extract more vanadium from industrial wastes, and various solutions for turning this into useful metal are under development. But we still need to come up with a better way to reach potential sources of this beautiful metal.

Source: IFLScience.com from May 17, 2016

Scientists Discover New Form of Light

DUBLIN, Ireland, May 17 (UPI) – Researchers in Ireland have discovered a new form of light. Their discovery is expected to reshape scientists' understanding of light's basic nature.

Angular momentum describes the rotation of a light beam around its axis. Until now, researchers believed the angular momentum was always a multiple of Planck's constant – a constant ratio that describes the relationship between photon energy and frequency, and also sets the scale for quantum mechanics.

The newly discovered form of light, however, features photons with an angular momentum of just half the value of Planck's constant. The difference sounds small, but researchers say the significance of the discovery is great.

"For a beam of light, although traveling in a straight line it can also be rotating around its own axis," John Donegan, a professor at Trinity College Dublin's School of Physics, explained in a news release. "So when light from the mirror hits your eye in the morning, every photon twists your eye a little, one way or another."

"Our discovery will have real impacts for the study of light waves in areas such as secure optical communications," Donegan added.



Researchers recently discovered a beam of light with photons traveling with an angular momentum never before measured. Photo by agsandre/Shutterstock

Researchers made their discovery after passing light through special crystals to create a light beam with a hollow, screw-like structure. Using quantum mechanics, the physicists theorized that the beam's twisting photons were being slowed to a half-integer of Planck's constant.

The team of researchers then designed a device to measure the beam's angular momentum as it passed through the crystal. As they had predicted, they registered a shift in the flow of photons caused by quantum effects.

The researchers described their discovery in a paper published this week in the journal *Science Advances*.

"What I think is so exciting about this result is that even this fundamental property of light, that physicists have always thought was fixed, can be changed," concluded Paul Eastham, assistant professor of physics at Trinity.

Source: upi.com from May 17, 2016

Opals from the Lightning Ridge Opal Field, New South Wales, Australia



Topics in Gemology

Topics in Gemology is a monthly column written by Diana Jarrett, GG, RMV, based on gemological questions posed to her over the years by beginners and experts alike. Contact her at diana@dianajarrett.com.



The Story Behind the Stone **Mine to Market - Opal's Colorful Journey**

Precious opal has been holding fans spellbound for centuries. The gemstone is unique in more ways than its kaleidoscopic appearance. This stone is a hydrated amorphous form of silica and usually contains between 6 - 10% water by weight. It's not unheard of for specimens to have up to 20% water, either.



Underground with Hydraulic Rotary Head Digger; Large Black Pipe Suctions up Dirt for Processing. Courtesy: John Ternus, Opal Guy.

The mesmeric play of colors for which opal is revered owes a debt of gratitude to its unusual internal structure. Unlike diamonds and gemstones with a cubic crystal structure, opal is composed of microscopic silica spheres which diffract light into its rainbow hues.

When people get the opal bug, it often bites deep. Take John Ternus for example. Called the Opal Guy for good reason, John's been mining these treasures in Australia for over 35 years. Opal is found around the world in certain geological conditions, but by far, the most renowned region remains Australia. The finest of the fine is said to occur in the famed Lightning Ridge deposits of New South Wales, bordering Queensland. It is the only locale where stable black opal can be found. The deep opaque tone of black opal creates a dramatic contrast for vibrant colors to dance across the face of these majestic gems.

A recent conversation with Ternus illuminates the miner's love for these marvels. "I am continually amazed at the varieties of opal colors in proximity to each other and in combination with the same stone," he confides. The base colors, whether transparent, white, grey, or black, Ternus feels, "are influenced by the inclusion of trace elements in the opal, and the gem color which is dictated by the size of microns of the light refracting silica spheres."

Opal Guy Ternus is still enchanted by what he uncovers in these remote deposits. "In mining, I have found black crystal opal with red and green color-play next to root beer brown body color opal with a globule of gem multi-color crystal opal in the center of it. Trying to imagine what was going on with regards to the geological events that came to form the opal is fascinating." Besides their intrinsic beauty, each opal is distinct in shape, size and color combination. And that aspect has endeared them to both art lovers and devotees of one-of-a-kind jewelry pieces.

He also finds these magnificent gems have a story to tell. "Though some might be similar, they are all different and their variety is astounding," he said. "They are like people, each with their own personality."



Opal and Diamond Ring in Yellow Gold. Courtesy: John Ternus, Opal Guy.

"Personally, when I look at an opal," Ternus confides, "it's easy to believe that there is a greater power at work in the universe that would gift such treasures like these stones." I think we'd all agree there is something out of this world about this multi-color muse.



Opalized Pine Cone. Courtesy: Lightning Ridge Opal Company.



Bring an additional friend or loved one!

130th Anniversary New York Mineralogical Club Banquet

Date: October 19, 2016 [Wednesday Evening]
 Time: 6:00 p.m. - 11:00 p.m. [Social Hour & Silent Auction from 6 p.m. - 7 p.m.]
 Place: Holiday Inn Midtown Manhattan, 57th Street Between Ninth & Tenth Avenues, NYC
 Cost: \$30 for Members/Guests (*Advance Payment*); \$35 for Non-Members (or *Payment at the Door*)

Gala Dinner Menu (tentative)



Salad
 Choice of Entree:
chicken • fish • beef
 Potatoes & Vegetables
 Selection of Breads & Rolls
 Red & White Wine
 Soft Drink Assortment
 “Garnet” Dessert Selection
 Coffee & Tea



Special Guest Lecturers

Vivien Gornitz, Anna Schumate, Mitch Portnoy
“The Sparkle of Opal”

Amount			
	Please reserve _____ seat(s) for me at the Banquet @ \$30.00 (\$35.00) each. I will <i>probably</i> be ordering G Salmon G Chicken G Beef G Vegetarian for my dinner entree(s).		
	Also included are my 2017 New York Mineralogical Club membership dues (\$25 Individual, \$35 Family).		
	I am adding a wine/dessert donation to help make the banquet an affair to remember. (Each bottle costs about \$25.)		
	I'd like to get one of drawstring backpacks which features the Club. (Each backpack costs \$5.00)		
	Please reserve a set of the following boxed note card sets for me (Sets for \$6.00 each include envelopes): G Opal! G Mineral & Gem Bookplates G Jade G Native Elements G Crystallography G Thin Sections G Diamonds G Birthday Mineral Cards G Malachite G Lapis Lazuli G Quartz		
	I wish to make an additional donation as a sponsor to help support the Banquet and the NYMC.		
	← Total Included	Comments:	
Name(s)			
Street Address			Apt. No.
City		State	Zip
Phone		Email	

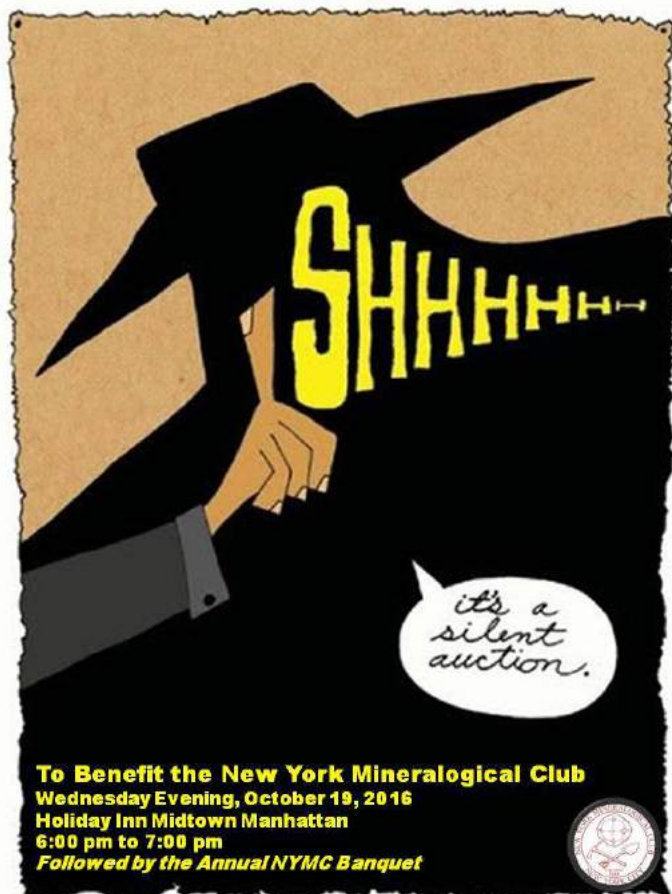
Send in the reply order form above by October 17, 2016.

We must receive this RSVP in order to guarantee your reservation(s). Make your check payable to the “New York Mineralogical Club” and send it to: New York Mineralogical Club Banquet, P.O. Box 77, Planetarium Station, NYC, NY 10024-0077.
 Or call Mitch Portnoy (212) 580-1343 or email him at mitchpnyc@aol.com.


Join Us
at the
Annual Banquet Meeting
of the
New York Mineralogical Club

Wednesday, October 19, 2016
6:00 pm Silent Auction
7:00 pm Dinner & Meeting
Holiday Inn Midtown Manhattan

Theme: The Sparkle of Opal
Tickets: \$30.00 Each
RSVP Requested

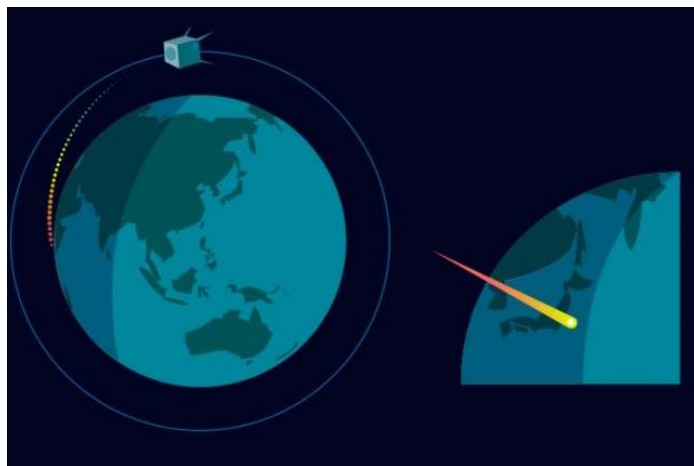
To Benefit the New York Mineralogical Club
Wednesday Evening, October 19, 2016
Holiday Inn Midtown Manhattan
6:00 pm to 7:00 pm
Followed by the Annual NYMC Banquet



Japanese Company Wants to Create Artificial Meteors for the 2020 Tokyo Olympics

By Jonathan O'Callaghan

A Japanese company has announced that it wants to create artificial meteor showers, and some reports indicate they may do so during the 2020 Tokyo Olympics.



A spacecraft would release pellets in low Earth orbit. Star-ALE

The company is called Star-ALE, and their goal is to launch a spacecraft that releases pellets – each costing \$8,000 – in low Earth orbit. As the pellets re-enter the atmosphere, they burn and produce a flash of light similar to that created by natural meteors.

The project is known as Sky Canvas, with the spacecraft being loaded with 500 to 1,000 of these spherical pellets. In lab tests, the company found they could change the color of the meteors by using different elements. Lithium will shine pink, for example, while copper will shine green.

Now, we initially reported on this proposal in June of last year, but it's doing the rounds again owing to this link to the 2020 Tokyo Olympics. However, there doesn't seem to be anything from the company confirming these recent reports. We've asked for comment, and will update the post if or when we hear anything.

What is verifiable, though, is that Star-ALE will launch a demonstration spacecraft as early as next year. The pellets will burn up in the atmosphere at an altitude of about 60 to 80 kilometers (35 to 50 miles), and they'll be visible on the ground across an area spanning 200 kilometers (125 miles), 400 times wider than a firework exploding at an altitude of 500 meters (1,640 feet).

Each meteor would apparently shine with a magnitude of about -1, which is brighter than Sirius, the brightest star in the night sky. The company said that 30 million people in Tokyo would see the meteors.

"When the satellite stabilizes in orbit, we will discharge the particles using a specially designed device on board," the company said on its website. "The particles will travel about one-third of the way around the Earth and enter the atmosphere. It will then begin plasma emission and become a shooting star."

You may be wondering what the point of all this is. After all, 1,000 pellets would cost \$8 million, a rather hefty price, and that's not even including the cost of developing the spacecraft or launch costs. However, the company's founder hopes that the project can inspire more investment in space-based scientific research.

"This type of project is new in the sense in that it mixes astronomy and the entertainment business," said CEO Dr. Lena Okajima, reported Core 77. "These shooting stars that are born through science function as a high-profit entertainment business, and the resulting funds will serve to further advance fundamental scientific research."

We'll have to wait and see if that's the case. Still, it's a pretty neat idea regardless.

Source: IFLScience.com May 24, 2016

2016 Opal Banquet Silent Auction Listing

The following is a listing of the silent auction choices that will be available for your bidding at the Gala Banquet on Wednesday, October 19, 2016. (Expect more to be offered on the evening!)

Thanks to all contributors!

Remember: we are still happy to accept items, especially related to opal, for this year's silent auction!

Special Opal Section

1. Australian Precious Opal Book
2. Book of Opals Book
3. **Opal, 3.81 Carats, Half-Moon Gem** **Ethiopia**
4. Opalized Wood Goldfield, Nevada
5. Boulder Opal Pendant/Necklace Ethiopia
6. **3-Opal Stone & Gold Necklace** **Ethiopia**

Collector Minerals, Thumbnails & Crystals Section

7. Actinolite Madagascar
8. Natrolite Oregon
9. **Malachite** **Zambia**
10. **Yellow Mica** **South Dakota**
11. Sulfur Mexico
12. Amethyst Cluster South Africa
13. Amethyst Scepter South Africa
14. **Diopside** **Congo**
15. Quartz with Inclusions Mexico
16. Apatite & etc. Canada
17. Malachite Zambia
18. Azurite & etc. Bisbee, Arizona
19. Pink Tourmaline Namibia
20. Barite Illinois
21. Apatite, Calcite & etc. Canada
22. Pyrite & etc. Elba
23. Stibnite & etc. Nevada
24. Fluorite Weardale, England
25. **Sylvite (Hugh Ford Label)** **New Mexico**
26. Sphalerite etc. Mexico
27. Chrysotile Canada
28. Clinoptilolite-Na Oregon
29. Diopside in Calcite Canada

Jewelry Section

30. (2) Tiger-Eye Bangles & TE Silver Pendant NA
31. Ring (7 ½): Green Onyx & Sterling NA
32. Ring (6): Goldstone & Sterling NA
33. Ring (7): Faceted Quartz & GP Sterling NA
34. Ring (10): Navaho, Sterling with Yei Figure USA
35. Pendant: Sterling & Multi-Gemstone (Marked) NA
36. Pendant: Malachite Cab in Silver NA
37. Pendant: Moonstone in Silver NA
38. Pendant: Peridot & Fossil in Silver (Marked) NA
39. Pendant: Jasper, Moonstone, Garnet in Silver (Marked) NA
40. Pendant: Citrine in Silver, Citrine Bead Strand NA
41. Pendant: Freshwater Pearl & Silver NA
42. Amber: Pendant in Silver & Earrings in Gold NA
43. Necklace: Prehnite/Epidote & etc. NA
44. Necklace: Colored Mother of Pearl Disks NA
45. Necklace: Kyanite, Pearl, etc. NA
46. Necklace: "Modern" Metal & Ceramic NA
47. Necklace: Red Gemstone Quatrefoil & Silver Chain... NA

Lapidary & Carvings Section

48. Cobra Figurine Southwest USA
49. Mouse Figurine Southwest USA
50. Bullfrog Figurine Southwest USA

51. Ram Figurine Southwest USA
52. Polished Fluorite Obelisk China
53. Mounted "Painting" Stone China
54. Polished Agate Geode Slice Brazil
55. Honed Zincite New Jersey
56. (2) Polished Pieces of Jade NA

Publications, Science, Rarities & Other Section

57. *Jade: Stone of Heaven* Book
58. *Jade* Book
59. *Volcanos* Book
60. *Agates* Book
61. *Handwrought Jewelry* Book
62. *Gemstone Buying Guide* (by R. Newman) Book
63. Erythrite & Carminite Mexico
64. **Pyromorphite** **Scotland**
65. USA Mineral Set & Mineral Quiz For Kids!
66. Ore Sample Tsumeb
67. Torbernite & Autunite Connecticut
68. Red Tourmaline Mt. Mica, Maine
69. (2) Rubies & (4) Pyrite Cubes Madagascar/Unknown
70. Brookite & Perovskite Arkansas
71. Corundum/Staurolite/Eudyalite/Other Russia
72. Rutile Micros (Tube!) Georgia

NYMC October 2016 Opal Banquet Gifts



Cards Available at the Banquet – \$5.00/Box



Magnificent Opals!



An Amateur Undertaking in Australian Mining Town with No Funeral Home

By Michelle Innis



Timbo Molyneux, left, his father, Ormie, right, and Ian Woodcock, all amateur undertakers, placed the coffin of Valerie Van Emmerik on the dance floor at a bowling club in Lightning Ridge, Australia, this month. Credit Conor Ashleigh for The New York Times

LIGHTNING RIDGE, Australia — An opal miner with a bushy beard and muddy boots, Ormie Molyneux lifted the dead woman's thick body and placed it gently in a satin-lined coffin. His son, Timbo, helped. Then they picked up the polished lid and carefully pressed it shut.

Mr. Molyneux was not one to complain. But there were problems on the horizon for the all-volunteer Lightning Ridge Funeral Advisory Service, the town's only undertakers.

The first was the woman before him, Valerie Van Emmerik, a thrice-married, rabbit-hunting miners' cook who had once knocked a man down in a fistfight. She had to be buried, but heavy rains had turned the cemetery to mud and left her grave two-thirds full of water.

And a veterans' club is kicking the group out of a property it used to house its two hearses, a shed needed to keep them in good condition in the extreme temperatures here.

"It was a kick in the guts," Mr. Molyneux said.

Lightning Ridge, a sunbaked opal-mining town on the edge of Australia's outback, has never had a professional undertaker. The nearest one, an hour's drive away, sometimes refused to come, and hauling a body in a van as it bounced along potholed roads and swerved to avoid skittish kangaroos was a dicey proposition.

So more than 20 years ago, a group of locals decided to do the job themselves, becoming amateur undertakers. Since then, they have buried 450 of their friends and neighbors.

Mr. Molyneux pulled a soft rag from the pocket of his miner's shorts and polished faint fingerprints from the coffin's glossy surface. "Ninety-nine percent of the people we bury, we know," he said. "It's not easy. Val was a good woman."

"Everyone knew Val," said Ian Woodcock, 78, the Funeral Advisory Service's manager. "She had a hard life. Her second husband wore her out."

Mrs. Van Emmerik was loaded into the back of a black hearse and delivered to the Lightning Ridge Bowling Club, where her coffin was wheeled to the center of the faux parquet dance floor. With the cemetery a mud pit, the lawn bowling clubhouse would have to suffice for the funeral service.

Mrs. Van Emmerik and her third husband, Peter, ran a rough miners' pub, sardonically named the Glengarry Hilton, near a cluster of opal mines. "Peter was the love of her life," said her son Garry Horley, 61. The eldest of her six children, he had flown across the country from Western Australia for the funeral.

"Val was a terrific painter," said Paddy Ellis, 67, a miner. "And she was great at making pies."

"She married a lot of people," said Barbara Moritz, the manager of the Historical Society. "She was a slow learner."

Nine days earlier, Mrs. Van Emmerik was felled by a massive heart attack at the age of 79.

This was Mr. Molyneux's 15th funeral in five months. At 57, he is a third-generation opal miner and the second Molyneux to work as a volunteer undertaker, a service his late uncle Bob founded. No one is exactly sure when.

Lightning Ridge, with its small-scale, high-stakes opal mining, attracts a certain type — loners who come to escape society and find their fortune. Miners peg and register claims, stipulated by law at 160 feet by 160 feet, and fiercely guard those claims against thieves.

"You can have the arse out of your pants in the morning and be a millionaire by the afternoon," said Tony O'Brien, 79, a miner attending Mrs. Van Emmerik's funeral.

There are 900 houses in the township of Lightning Ridge, but an additional 1,750 camps on the opal fields, where miners often live alone in tents or trailers, unconnected to the town's water and electricity supply.

They often die alone, and sometimes penniless, another reason undertakers from the town of Walgett refused to come to Lightning Ridge.

The volunteers collect bodies from simple cottages in town, from canvas tents on the dusty pink opal fields and from trailers parked at the edge of pebbly mine shafts. Sometimes they retrieve bodies from the scrubby saltbush brush, where out-of-luck miners retreat to end their lives.

"Summer is the worst," Mr. Molyneux said. Temperatures rise above 112 degrees, and stay there for days. "It doesn't take long for a body to fall apart in that heat," he said, recalling a dead miner whose arm fell off as he tried to pick up the body.

Mr. Woodcock has buried a murderer and miners killed in collapsed shafts.

But mostly, "it's about heart disease and heat up here," said Sandra Kuehn, who manages the local doctors' office. "It's the smokes and drink that kill them."

As the service for Mrs. Van Emmerik began, mourners started to fill the bowling club. The Rev. Neville Parish, a retired minister who had been called back for the funeral, asked if anyone wanted to speak.

Mr. Horley talked about his mother's love for Lightning Ridge. Jerry Lomax, a former president of the Lightning Ridge Miners' Association, told the story of the time he had been punched to the floor at a miners' meeting in a dispute over mining rights. Mrs. Van Emmerik, the group's secretary, had leapt to her feet "and taken the miner out" who hit him.



Opal rough from Lightning Ridge Opal Mine

Mr. Woodcock, known as Woody, had in 1996 raised \$33,000 to build a morgue, a sparse three-room building with a linoleum floor, where a dozen silver-handled coffins stand upright in two rows.

There is an air conditioner, a shower, three narrow steel trolleys to carry bodies and a refrigerator, which once stored beer for the local Lions club. Now it sometimes holds club members.

Mr. Woodcock learned the trade from a friend who ran a funeral home closer to Sydney.

"I did a beautician's course and can do hair and makeup," he said. "That was important for one burial. The children wanted their mother to look nice."

There is no embalming service.

Helen Stewart-Crawford, 79, the service's secretary, takes information like date and place of birth, and names and ages of family members for the government records office.

"Woody deals with people who are insane with fury or anger or sorrow," she said. "He is a very good listener."

If a minister cannot officiate, sometimes Mr. Woodcock's wife, Yvonne, 73, does.

One of the town's doctors or police officers certifies the death. When there is doubt over the cause, the body is sent to a coroner in Newcastle, 420 miles to the southeast.

The undertakers charge about \$2,600 for a complete service, including \$600 for the cemetery plot and gravedigger.

"It costs a lot of money to set up the infrastructure to run a funeral business," said Gillian Manson, a divisional executive officer from the Australian Funeral Directors Association, in Melbourne. "What they've got in Lightning Ridge is rare. It's unlikely to be replicated elsewhere."

The veterans' association, the Returned and Services League, wanted more money for their shed than the Funeral Advisory Services could spend. The service owned two hearses, a black Ford purchased in 1980 and a 1963 silver Chevrolet, and needed a place to keep them.

"It's one more thing," Ms. Stewart-Crawford lamented.

Mr. Woodcock reached an agreement with the shed's new owner to store his hearses temporarily, but new premises must be found.

Mr. Parish told mourners there was no chance Mrs. Van Emmerik would be buried straight after the service. A three-year drought had ended with a three-day downpour that had turned the cemetery to mud.

"Mum has broken the drought," said Mr. Horley.

"Time To Say Goodbye" played over the club's loudspeakers as Mr. Horley and other pallbearers carried Mrs. Van Emmerik's coffin back to the black hearse to be driven to the mortuary. Her body would be returned to the refrigerator until the ground had dried out.

Mrs. Woodcock set out plastic trays of egg, ham and tomato sandwiches and hot tea. The bar was opened for beer and wine.

By 9 p.m., some 10 hours after the service began, only a small cluster of family and friends remained. Television sets above the bar blared out weekend sports news.

Mr. Molyneux made his way into the cold night air and smiled. Mrs. Van Emmerik had been given a good send-off.

Source: New York Times June 20, 2016



7.75 ct. Harlequin Opal, Lightning Ridge, Australia

Lava 'Skylights' are the Coolest Natural Feature You Never Knew Existed

Peer into the Depths of Molten Mother Earth.

By Landess Kearns

On Hawaii's Kilauea volcano, astonishing geological phenomena happen daily.

Sometimes, that means lava birthing new land by flowing directly into the ocean or lava lake explosions sending bizarre glass formations into the sky.

Other times, it's Mother Nature giving us a peek into what's happening below the surface, with something called a lava "skylight."

In recent weeks, Kilauea, one of the world's most active volcanoes, has seen new lava breakouts, which have caused some mind-boggling activity. This includes a number of these so-called "skylights" – which might be the coolest geological feature we've ever seen.

Put simply, a lava skylight is an opening in the roof of an underground lava tube. The hole forms when a portion of the tube collapses, revealing the flowing stream of lava within.

In the case of the tube pictured below, the crust of the roof of the lava tube was probably too thin to support itself, Hawaiian Volcano Observatory geologist Tim Orr told Big Island Video News.



This lava skylight is an estimated 20 feet across. USGS

These photographs, which were taken from a helicopter, are actually a bit deceiving, making the skylights seem smaller than they actually are. The one above, for instance, is about 20 feet in diameter, according to the Hawaiian Volcano Observatory website.

The most fascinating thing about skylights is the rare glimpse they provide into what is happening beneath the cooled surface of a lava field. Often, there are rapid flows moving in lava tubes underneath the black, cooling crust, invisible without a crack or hole.

Orr estimated the lava seen within the skylight to be flowing at a rate of 1 to 2 meters per second, though he noted that there is no way to scientifically measure the speed of the lava within the tube.

Here are a few more epic views of lava skylights, because we honestly can't stop staring.



Source: huffingtonpost.com from June 22, 2016

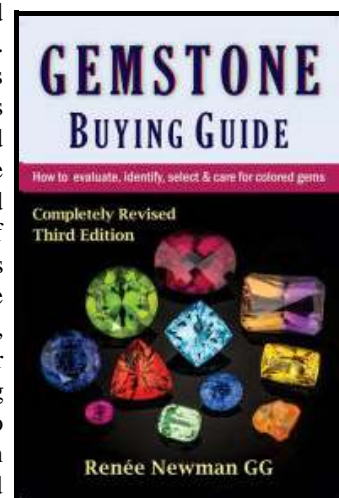
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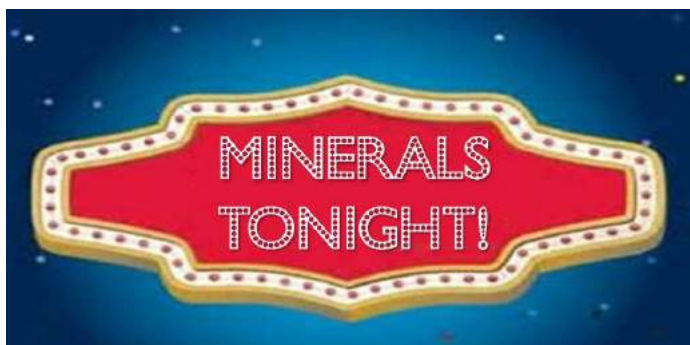
Gemstone Buying Guide, 3rd Edition

How to Evaluate, Identify, Select & Care for Colored Gems

By Renée Newman, GG

This updated full-color guide to colored gems provides concise yet comprehensive information on quality evaluation, price comparison, gem identification, cutting styles, treatments, fake stones, optical effects, gem care and geographic sources. Many of the gems are shown mounted in striking designer jewelry. There are 323 new color photos and several new gem species and varieties in this new Third Edition. Also included are interesting historical facts mixed with scientific data and a bit of folklore. Written for consumers and professionals, the Gemstone Buying Guide is a practical, well-illustrated resource for buying, identifying and caring for colored gems. If you want to become a savvy buyer and learn how to select colored gemstones, then you'll find the Gemstone Buying Guide a fascinating and valuable resource. 356 color photos / 156 pages / paperback





(Sung to the tune of “Comedy Tonight” from *A Funny Thing Happened on the Way to the Forum* by Steven Sondheim)

Something aesthetic,
Something magnetic,
Something for everyone:
Some minerals tonight!

Something with luster,
Formed in a cluster,
Something for everyone:
Some minerals tonight!

Simulants – out!
Nothing that’s fake!
View all the gems,
both clear and opaque!

Old labeled treasures,
Books with their pleasures,
Ranging from alum to zincite.
Economy tomorrow,
Minerals tonight!

Amber – Jurassic;
Others are classic,
Something for everyone:
Some minerals tonight!

Jewelry – all sorts,
Garnet and hard quartz,
Carvings for everyone!
Some minerals tonight!

Nothing with glue,
Nothing repaired;
Treatments of all kinds
have to be shared!

Pyrite that’s cubic,
(Not one of Rubik!),
Also some gold that will excite!
Stress out tomorrow!
Minerals tonight!

Pieces scholastic,
Sparkling, fantastic,
Something for everyone:
Some minerals tonight!

Choice that’s extensive,
Not too expensive,
You want to bid now for
Some minerals tonight!

No rocks for you,
Granite or gneiss;
Just let me know your
best purchase price!

After inspection,
Grow your collection.
Choices of all sorts will delight!
Open up the curtains!
Minerals tonight!

Broken Mirrors to X-Ray Plates: Olympic Gold Not What it Seems

By Caio Saad

RIO DE JANEIRO, June 28 (Reuters) – Ask athletes what goes into Olympic gold medals, and they will likely say sweat and years of training. For Brazil’s National Mint the answer is simpler: recycled silver.



The 500-gram (17.6-ounce) Olympic gold medals that Usain Bolt, Michael Phelps and other athletes will be competing for in Rio de Janeiro are nearly 99 percent silver. They contain just 1.2 percent gold, mostly used as plating.

“It’s a great honor and a great responsibility,” said Victor Hugo Berbert, head of medal-making, as he showed Reuters around the mint in Rio de Janeiro.

Each of the 5,130 Olympic and Paralympic medals takes about 48 hours to make, said Berbert, who has an 80-strong team working shifts around the clock.

The medals are the most sustainable in Olympic history. Much of the silver is recycled from old mirrors and X-ray plates. The gold is free of mercury, which is often used to separate gold from ore and can poison local ecosystems if not carefully disposed of.

Nike, the winged goddess of victory in Ancient Greece, is minted on one side below the five Olympic rings, while the discipline for which the medal has been won is engraved along its edge. The other side bears the Rio 2016 logo.

“It’s a sense of great satisfaction that our work will be worn on the chests of athletes who have given everything to win,” said Nelson Neto Carneiro, who has worked at the mint for over 40 years.

Source: AOL Sports June 29, 2016



2016-17 Club Calendar

Date	Event	Location	Remarks & Information
October 19	Annual Gala Banquet	Holiday Inn Midtown Manhattan	Theme: <i>Opal</i> ; Lecture; Silent Auction; Awards; Opal Game; Gifts & Surprises!
November 16	Meeting at 6:30	Holiday Inn Midtown Manhattan	Special Lecture: Anne Pizzorusso – “Paradise Bejeweled: Gems of Dante’s <i>Divine Comedy</i> ”
December 14	Meeting at 6:30	Holiday Inn Midtown Manhattan	Special Lecture: Howard Heitner – “Pseudo-What?!”
January 11, 2017	Meeting at 6:30	Holiday Inn Midtown Manhattan	Special Lecture: Mitchell Portnoy – “Minerals & Gems in Popular Culture”; Chinese Auction
February 8	Meeting at 6:30	Holiday Inn Midtown Manhattan	Annual Members’ Show & Tell
March 8	Meeting at 6:30	Holiday Inn Midtown Manhattan	Special Lecture: Alfredo Petrov – “Iris Quartz”; Special meeting game
April 19	Meeting at 6:30	Holiday Inn Midtown Manhattan	Special Lecture: Charles Snider (1 st Timer!) – “The American Geode Story”
May 10	Meeting at 6:30	Holiday Inn Midtown Manhattan	Special Lecture: TBD
June 14	Annual Benefit Auction	Holiday Inn Midtown Manhattan	Details to follow; Online catalog available!
July 12	Meeting at 6:30	Holiday Inn Midtown Manhattan	New summer meeting addition to calendar!

2016-17 Show or Event Calendar

Date	Event	Location	Remarks & Information
September 24-25	Franklin & Sterling Hill Gem and Mineral Show	Franklin Elementary School, 50 Washington Ave, Franklin NJ	Franklin Mineral Museum sponsors as their only large fund-raising event
October 15-16	Annual Bristol Gem & Mineral Show	Beals Community Center, Bristol, Connecticut	website: www.Bristolgem.org
October 21-23	EFMLS Convention/Show	Rochester, New York	Article Contest Results; Details to Follow
November 12-13	Fall NYC Gem, Mineral & Fossil Show	Grand Ballroom, Holiday Inn Midtown, New York City	20+ diverse dealers; lectures; wholesale section (with credentials); NYMC Booth New: Geode Cracking for Kids!
November 26-27	Morristown Museum Show	Morris Museum, Morristown, NJ	Hours are Sat: 11-5 pm, Sun 12-5 pm
February 2017	Tucson Mineral Shows	Tucson, Arizona	Multi-week event, scores of locations
March 4-5	Spring NYC Gem, Mineral & Fossil Show	Grand Ballroom, Holiday Inn Midtown, New York City	20+ diverse dealers; lectures; wholesale section (with credentials); NYMC Booth
June 9-11, 2017	AFMS Convention/Show	Ventura, California	Article Contest Results; Details to Follow
October 20-22, 2017	EFMLS Convention/Show	Bristol, Connecticut	Article Contest Results; Details to Follow

For more extensive national and regional show information check online:

AFMS Website: <http://www.amfed.org> and/or the EFMLS Website: <http://www.amfed.org/efmls>

White Cliffs Opal Field, New South Wales, Australia



Founded in 1886 for the purpose of increasing interest in the science of mineralogy through the collecting, describing and displaying of minerals and associated gemstones.

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P.O. Box 77, Planetarium Station, New York City, New York, 10024-0077

2016 Executive Committee

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Dues: \$25 Individual, \$35 Family per calendar year. **Meetings:** 2nd Wednesday of every month (except July and August) at the Holiday Inn Midtown Manhattan, 57th Street between Ninth and Tenth Avenues, New York City, New York. Meetings will generally be held in one of the conference rooms on the Mezzanine Level. The doors open at 5:30 P.M. and the meeting starts at 6:45 P.M. (**Please watch for any announced time / date changes.**) This bulletin is published monthly by the New York Mineralogical Club, Inc. The submission deadline for each month's bulletin is the 20th of the preceding month. You may reprint articles or quote from this bulletin for **non-profit usage only** provided credit is given to the New York Mineralogical Club **and permission** is obtained from the author and/or Editor. The Editor and the New York Mineralogical Club are not responsible for the accuracy or authenticity of information or information in articles accepted for publication, nor are the expressed opinions necessarily those of the officers of the New York Mineralogical Club, Inc.

Next Club Event: 130th Anniversary Banquet – Wednesday, October 19, 2016

Mezzanine, Holiday Inn Midtown Manhattan (57th St. & Tenth Avenue), New York City
The Evening's Special Theme & Lecture: “*The Sparkle of Opal*”

New York Mineralogical Club, Inc.
Mitchell Portnoy, Bulletin Editor
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FIRST CLASS



George F. Kunz
Founder

