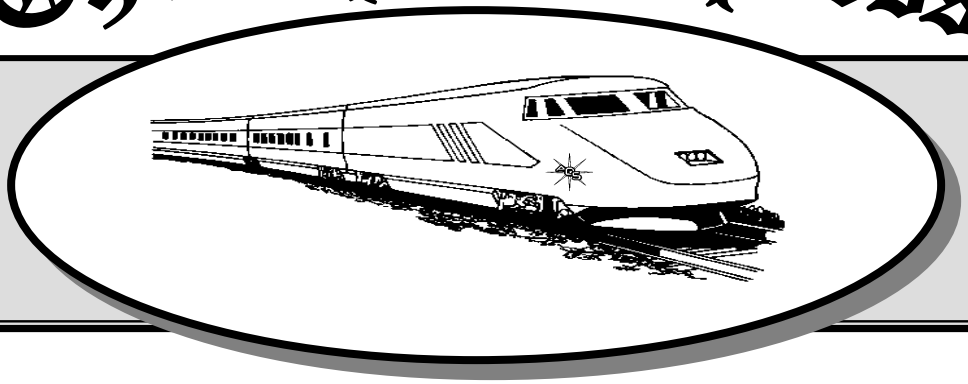
The Opal Express



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July 2013

Volume 46 Issue 7

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It's Coming!

The American Opal Society's 46th Annual

OPAL & GEM SHOW

The Largest Opal Show in USA!

Sat. Nov. 3, 2013 - 10AM - 6PM

Sun. Nov. 4, 2013 - 10 AM - 5PM

Opal and Gem Dealers from the USA and Australia.
Rough and Cut Opals; gemstones; jewelry & supplies.
Huge Raffle many prizes of gemstones, jewelry, tools, etc.
Free Opal Seminars on Saturday with Paid Admission.
Free Demonstrations on gem cutting, jewelry making, etc.

New location!

The Phoenix Club - Festhalle

1340 S. Sanderson Ave., Anaheim, CA 92806

Dealer spots are still available!

If you are interested, contact us ASAP!

Veronica Pupura
(714) 974-3982 angeldragonoflight@yahoo.com

Jim Pisani
(714) 815-4638, editor@opalsociety.org

July Speaker: Justin Zzyx on So. Cal. Agates

This Thursday, July 11, Justin Zzyx will give a talk on Agates of Southern California.

Justin is the owner of the Zzyx Gallery of Natural Science in Los Angeles, CA (http://www.zzyxgallery.com). He also owns and manages http://www.the-vug.com, the largest mineralogical database online, and founded http://www.fakeminerals.com, and Rockhounding Videos (http://www.rockhoundingvideos.com)

Justin Zzyx has worked for over a decade within the greater mineral, rock, & gem collecting community.

He gives lectures and leads public field trips for many of the local Southern California mineral clubs and organizations. Through direct contact and hands on education, he is able to promote a greater understanding of the vast mineral resources within, not only California, but the American Southwest.

He is the co-owner and Director of Public Relations for the 2nd most visited mineralogical website online, The-Vug.com.

In 2008, Justin began publishing The-Vug.com Quarterly Magazine, a free, color trade magazine, targeting the international, amateur, mineral collecting public.

This magazine features guides, articles, and stories relating to all aspects of mineral, rock & gem collecting, but primarily focuses on providing scientifically accurate information, written in language that can be understood, even by a novice to the hobby. Now entering its 4th year in publication, The-Vug Quarterly, as it is affectionately known by its readers, distributes over 4,500 hard copies per issue, covering 36 states, 6 countries, and boasts thousands of additional downloads a month via the free .pdf archive. In February of 2011 Justin was named Gallery Coordinator for the Downtown Los Angeles Art Walk.

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AOS Calendar for 2013

Below is the AOS Calendar for 2013.

American Opal Society Calendar	
Date	**General Meeting Topic / Speaker**
10-Jan-13	Opals of The Americas, Part 2 – Jim Pisani
14-Feb-13	Fluorescent Minerals and Opals - Jim Pisani
14-Mar-13	Michael Greyshock on Gold Detecting
11-Apr-13	Dr. Walt Johnson on Jewelry Making
09-May-13	Video on Opal Mining in Brazil
13-Jun-13	Live Opal Auction
11-Jul-13	Jason Zzyx on Agates of Southern California
08-Aug-13	Member Show & Tell
12-Sep-13	To be announced
10-Oct-13	Opal & Gem Show Work Session
03-Nov-13	46th Annual Opal & Gem Show
04-Nov-13	46th Annual Opal & Gem Show
14-Nov-13	Opal & Gem Show Recap
12-Dec-13	AOS Christmas Party Potluck

Members Only Website Password

AOS website's members only area: Name: "member" and Password: "opalyear".

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Opal from the High Plains

By Dr. Mike Nelson, CSMS

Fig. 1. Faceted fire opals from Mexico. Photo courtesy of International Colored Gemstone Association.

I recently received a couple of questions/comments about finding opal on the plains of eastern Colorado, and in general throughout the state. Therefore, I thought this venue would be a good place for discussion.

Fig. 2. Outcrop of Ogallala Formation, Wallace County, Kansas. The more resistant beds contain a silicified sandstone/conglomerate as well as opalized nodules. Photo by author.

Opal is a mineraloid, a mineral-like substance that does not have a definite chemical formula nor a definite crystalline structure (although some opal has a loose ordered arrangement of the silica spheres). Perhaps the best known mineraloid is obsidian, an amorphous volcanic glass. Opal is hydrous silica, that is silicon dioxide (like quartz family minerals) but with an indefinite amount of water (up to perhaps 18%-20%) in its atomic structure. Eckel and others (1997) noted that new studies using an X-ray Diffractometer (XRD) show that opal commonly contains significant amounts of the high temperature polymorphs (same chemistry, SiO2) of quartz known as cristobalite and tridymite. The chemical formula is written as SiO2-*n*H2O where *n* represents the variable amount of water. In the real world, the more water opal contains the more likely a chance for desiccation and cracking (termed crazing). Opal comes in a variety of colors, has a hardness of 5.5-6.5, a waxy to dull to greasy luster, and a white streak. It also "feels light" as its specific gravity of 2.15 is less than the specific gravity of quartz at 2.65. I often find it difficult to identify common opal from other siliceous minerals such as chalcedony and agate; however, the key points seem to be the waxy/dull/greasy luster, and the low specific gravity. There is a plethora of names (well over 100 that I have located) assigned to opals with various colors and from different collecting localities. However, most collectors would differentiate opal into three broad groups: precious opal, common opal (including hyalite), and fire opal.

Of course, precious opal is the most valuable of the group and specimens are characterized by a "play of colors", that is a flash of colors (almost every color "in the rainbow") when moved and rotated. This play of colors seems due to the refraction, reflection, and diffraction of light as it passes through the internal structure of somewhat ordered silica spheres (Klein and Hurlbut, 1985). The best known collecting localities for precious opal are Coober Pedy and Lightening Ridge, Australia. The latter locality produces black opal that exhibits a play of colors with red, green, blue, violet, magenta or yellow against a dark background. In addition these Australian opals are valued for their stability (low water content).

In the U. S. the Virgin Valley of Humboldt County, Nevada, produces a fantastic array of precious black opal, much of it being opalized conifer wood, a pseudomorph after the original wood. I have found references to the following varieties (and several more) of precious opal: white opal (most common, white or cream stone color), black opal (dark stone with a strong play of colors), crystal opal (transparent to translucent stone), boulder opal (opal in veins),

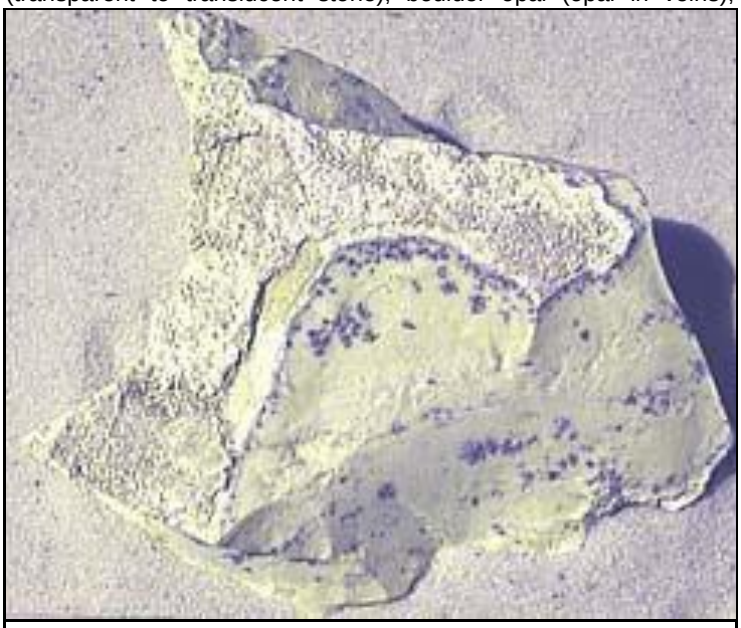

Fig. 3. Common opal with dendrites (manganese oxide) collected from western Kansas. Also known as "moss agate". Photo courtesy of Kansas Geological Survey.

harlequin opal (play of colors in rectangular shapes), pinfire opal (play of colors in small points), and cat's eye opal (play of colors in a "cat's eye"). In order to best display the play of colors, most precious opals are cut into cabochons, rather than shown faceted.

The famous opals of Nevada were officially recognized in 1987 when the State passed the following:

NRS 235.100 State precious gemstone. *The precious gemstone known as the Virgin Valley black fire opal is hereby designated as the official state precious gemstone of the State of*

Nevada. Australia went even a step further when the Commonwealth, in 1993, declared opal as the national gemstone.

Besides Nevada, other U. S. states producing precious opal on a commercial scale include: Arizona (two mines producing blue precious opal), Idaho (second in production to Nevada), known for pink precious opal, Louisiana (sandstone with precious opal cement), and Oregon (from geodes or "thundereggs") (U. S. Geological Survey, 2002). Many other states produce precious opal on a small scale collector or specimen basis.

Fire opals usually do not display a play of colors (some brown-tones may be an exception), are translucent to transparent and most often come in a variety of "earth tones"—yellow, oranges, and reds, most likely due to the presence of minute amounts of iron oxide. The most famous collecting localities for these gems is in the State of Queretaro, Mexico although Australia is now producing significant quantities and Brazil has opened a mine producing orange and yellow stones. In the U. S. Oregon is producing orange fire opals. Not all fire opals need cutting into cabochons as many display facets quite nicely (Fig. 1).

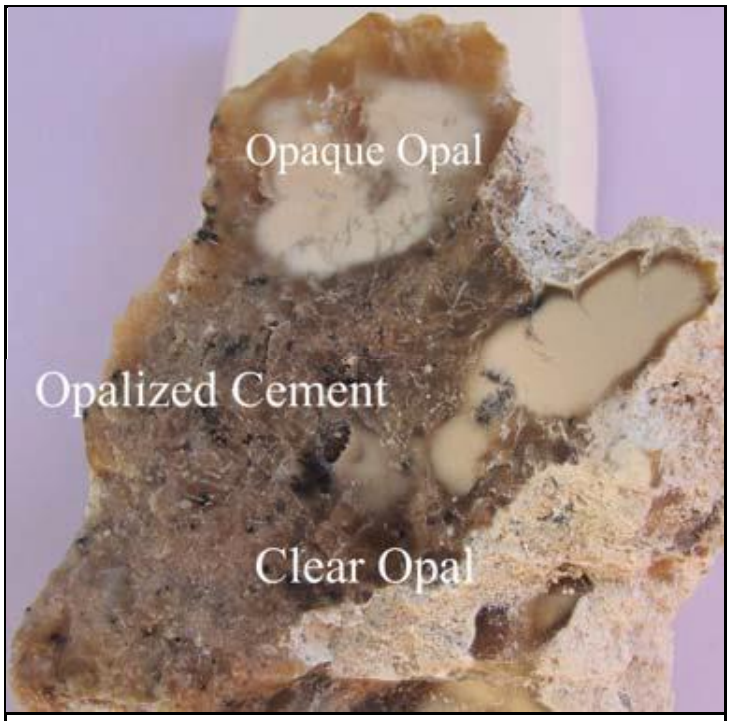

Fig. 4. Nodule of almost pure opal collected from the Ogallala Formation south of Wallace, Kansas. The transparent or clear opal is almost gemmy. Specimen is about 5 inches in length. Photo by author.

Common opal does not show a play of colors but often displays opalescence, a sort of sheen on an otherwise chalky to transparent to translucent siliceous material. Opal is a mineral that is hard to describe; however, once you observe the gem it becomes recognizable (mostly!). Common opal usually is not considered a gemstone and according to some "authorities" is of little or no value (Oldershaw, 2004). However, beauty is in the eye of the beholder and I sort of enjoy common opal and have seen some really nice polished pieces.

Milk opal (commonly called potch), quarried from Australia, is sometime gemmy since it usually has a bluish opalescence. Wood opal, if not precious opal, can still display nice colors. Menilite (liver opal) is a grey to brown common opal evidently occurring only in scattered European localities (MinDat, 2010). Hyalite, sometimes referred to as water opal or Muller's glass, is a mostly colorless variety of opal usually found in globular concretions (MinDat, 2010). I have never observed hydrophane, an opaque variety that is highly porous and which turns more translucent or more transparent when immersed in water. Resin opal is a darker colored common opal with a resinous luster. Geyserite is an opal deposited around hot springs such as those found in Yellowstone National Park and is often confused with travertine (CaCO2) springs. In fact, most Yellowstone travertine is found at Mammoth Hot Springs while the remainder of the springs produces geyserite. Diatomite or diatomaceous earth, is a sedimentary rock composed of the fossilized remains of diatoms, a type of algae with an opalized skeleton. Interestingly, this nondescript opal has by far the most value since the uses in industry are enormously varied—from filters to insecticides to cat litter. In this part of the country the best known beds of diatomaceous earth are from the Tertiary Ogallala Formation of the High Plains. These diatoms evidently lived in warm fresh water lakes impounded in the vast fluvial system of the late Tertiary. Wallace County, Kansas, bordering Cheyenne County, Colorado, produced diatomaceous earth for many years from an open pit mine in the Ogallala. The locality is well known to vertebrate paleontologists as the lake sediments also have produced a nice vertebrate fauna, evidently animals "washed" into the lake by area streams.

Opal can form in a variety of environments. The famed Australian deposits have formed in Cretaceous sedimentary rocks as weathered silica collected in fissures, holes and other hollow spaces (a post-Cretaceous secondary formation of the opal).

The original source of the silica was feldspar-rich sedimentary rocks with normal weathering producing a silica gel.

One may envision how opal might form by purchasing Sodium silicate (Na2SiO3), or water glass, from a pharmacy, and then combining the substance with vinegar (a weak acid). The silicate reacts with the hydrogen of the vinegar to form silicic acid which turns into a hard glassy substance as water evaporates.

If the evaporation is rapid, numerous cracks will appear. Slow evaporation and the substance will be rather solid. This is a situation similar to the formation of opal---slower is better! Additional formational types of opal include: deposition of silica from hot water, the geyserites; leaching of silica from volcanic ashes; aqueous solutions percolating through organic matter, such as wood, with subsequent deposition, etc. Opal also occurs as a vein mineral in ore bodies or as amygdule fillings in volcanic rock, mostly rhyolite (Eckel and others, 1997).

Opal is rare in metamorphic rocks. Most opal is very young (geologically speaking) since it cannot withstand the heat and pressure associated with burial and metamorphism—the water is lost. I am guessing (I am not a chemist) that dewatered opal "becomes" a form of microcrystalline quartz such as chalcedony. Somewhere in my mind is a stored factoid that no opal is older than the Triassic (came from a class somewhere in the past); however, I could not locate a valid reference.

Eckel and others (1997) noted that common opal has been found at a variety of localities and different geological environments across Colorado, and I refer the reader to that wonderful publication. Very few localities in the state have produced significant amounts of gem opal or fire opal. Of interest to this article, however, is the common opal occurring in the upper Tertiary Ogallala Formation. I have written about the Ogallala Formation before and refer readers to the September 2010 CSMS Pick & Pack for an overview. In general, the Ogallala was deposited in a series of streams, flood plains and lakes extending eastward from the front ranges of the Rocky Mountains, an area now known as the High Plains (Fig. 2). Eckel and others (1997) listed a locality about 20 miles north of Burlington in Weld County, Colorado, that produced "moss opal". I have collected from this area and the material is rather poor, at least in the seams that I observed. However, areas across the state line in western Kansas have produced very nice specimens of moss opal (also known as moss agate) (Fig. 3). Within the last few months I have run across outcrops of the Ogallala that produced really nice specimens of opalized nodules that almost have a gemmy clear variety of opal (Figs. 4 & 5).

Silicified beds in the Ogallala have been known since the early part of the 20th century, mainly from Kansas, but also common in parts of Nebraska and Texas. The best known of these silicified beds is the aptly named "Green Quartzite", a quartz to opal cemented sandstone and/or conglomerate that forms the local "caprock" in many western Kansas localities. Of greater interest to this study are the concretions and beds described by Frye and Swineford (1946) as i*rregular masses (up to 8 inches in long diameter) of dense, cream-colored, waxy or resinous opal …containing vugs lined or filled with the more common translucent opal and some chalcedony, and on the outside consists of dull white porous silica… The rock is brittle and breaks easily with pronounced conchoidal fracture into small splinters.* The current thought is that the source of silica was the vast beds of volcanic ash scattered throughout the Ogallala. Essentially this opal is a weathering product---silica leaching downward from the overlying ash beds.

Fig. 5. Nodule of opal collected from Ogallala Formation south of Wallace, Kansas. Photo by author.

The opalized nodules south of Wallace, Kansas, pictured in Figs.4 & 5, are among the most beautiful of the opalized concretions that I have observed. Some of the translucent opal is almost, or may be, gem quality. Although small, the "moss" dendrites (manganese oxide) are also present. Currently CSMS member Rick Copeland is cutting several slabs off a nodule so we may obtain a polished surface. If any CSMS member wants to try their skills at faceting, please contact me. So, as an answer to the inquiries, common opal may be located near Wray, Colorado in road cuts of the Ogallala Formation; however, more impressive specimens are currently known from across the state line in Kansas. I am unaware of jewelry, cabochons or faceted stones from this opal. But---there is always a first time!

Oh, give me a home where the buffalo roam Where the deer and the antelope play Where seldom is heard a discouraging word And the skies are not cloudy all day

Dr. Brewster Higley penned these words describing western Kansas in a poem that later became the official State Song--- Home on the Range. I distinctly remember that students could not "pass" fifth grade until we were able to recite the entire poem (luckily I did not need to sing the song).

REFERENCES CITED

Frye, J. C. and Swineford, A., 1946, Silicified Rock in the Ogallala Formation: Kansas Geological Survey, Bull. 64, Pt. 2.
Klein, C, and Hurlbut, C. S., 1985, Manual of Mineralogy, 20th ed.: John Wiley and Sons.
MinDat, 2010, Mineral Database: http://www.mindat.org/ index.php.
Oldershaw, C., 2004, Guide to Gems: Firefly Books Inc. Buffalo, NY.
U. S. Geological Survey, 2002, An Overview of Production of Specific U.S. Gemstones: U.S. Bureau of Mines Special Publication 14-95.

From Oct 2010 Pick & Pan http://www.csms.us/pickandpack
Colorado Springs Mineralogical Society

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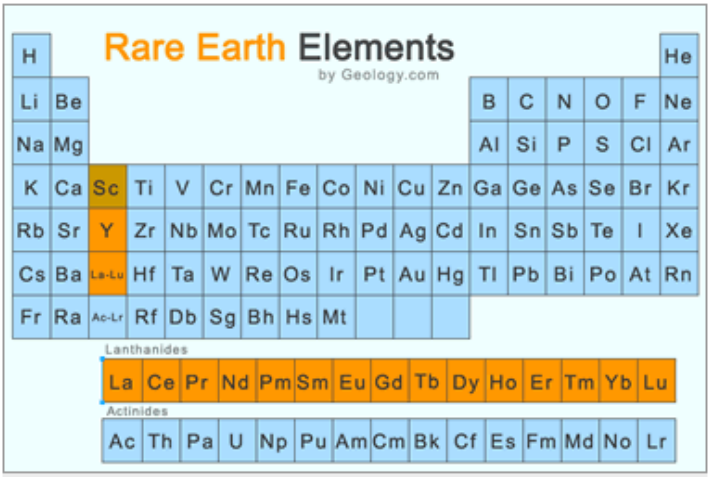
The Geology and Global Politics Of Rare Earths: Why Our High Tech Lifestyle Is Under Pressure

By Andy Weinzapfel acwein@gmail.com

Remember that old periodic table from high school? Rare earths elements (RREs) include the entire lanthanide group plus yttrium, shown in orange. Scandium is sometimes included. These elements have similar chemical properties and therefore tend to occur together in nature. They have one other thing in common: difficult- to- pronounce names!



REE Periodic Table: The Rare Earth Elements are the 15 lanthanide series elements, plus yttrium. Scandium is found in most rare earth element deposits and is sometimes classified as a rare earth element. Image by Geology.com.

The term "rare earth" is a misnomer, because most RREs are generally not that rare. The estimated average concentration in the Earth's crust ranges from about 150-220 parts per million, exceeding that of many metals commonly mined, like copper (55 parts per million) and zinc (70 parts per million) The problem is there are few geologic processes that concentrate RREs, unlike most other elements. This has major economic consequences, addressed later.

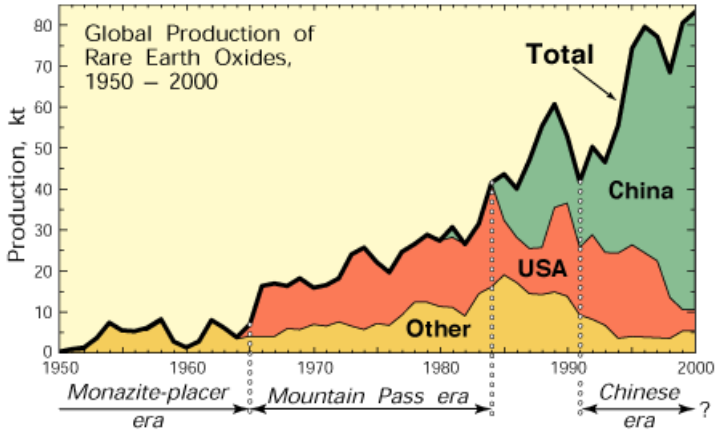
RRE ores are characterized as either "light", dominated by cerium, or "heavy", dominated by yttrium. Some wellknown minerals that contain cerium and other light REEs include bastnaesite, monazite, allanite, lanthanite, cerite, and fluocerite. Well-known minerals that contain yttrium and other heavy RREs include gadolinite, xenotime, samarskite, euxenite, fergusonite, and yttrofluorite. The smaller ionic size of the yttrium group elements allows greater solubility in rock-forming minerals, and thus yttrium and the heavy RREs show less enrichment in the Earth's crust than do cerium and the light RREs. This has economic implications: large ore bodies of the cerium light RREs are more common, while those of yttrium and heavy RREs tend to be rarer, smaller, and less concentrated.

RRE Applications

While a few uses for RREs are mundane, most are exotic. Modern research into the diverse nuclear, metallurgical, electrical, magnetic, optical, and catalytic properties of RREs has been opening up new cutting edge applications. The lapidary world has used cerium oxide as a polishing agent for many decades. Perhaps the most notable use of rare earth oxides for polishing is on the Hubble Space Telescope mirror. YAG, synthetic yttrium aluminum

garnet, was once common in jewelry, replaced for the most part today by cubic zirconia.

The earliest color TV sets had poor quality red, until europium as a phosphor dopant was introduced. RREs mixed with tungsten improve high temperature properties for welding. Various RREs are used in high refractive index lenses, catalysts for oil refineries and self-cleaning ovens, positron emission tomography (PET scan), and wind turbines. Virtually everything in the kitchen—including microwave and coffeemaker—uses RREs. RREs are critical to iPhones, MP3 players, high temperature superconductors, lasers, hybrid car components (especially batteries and motors), and optical-fiber communication systems. Many defense-related products use RREs, including night vision goggles, rangefinders, and smart bomb guidance systems. A motor made with neodymium-iron-boron magnets is far more powerful than one made with iron magnets. One of the more interesting inventions is magnetic refrigeration and heating. Air conditioners which use RRE magnets consume 1/10th the electricity of standard systems, with the added benefit of fewer moving parts to break down. Geology and Geographic Distribution of Rare Earths Even after 4.5 billion years of earth history processes, natural geologic separation of RREs has been extremely poor relative to almost all other elements we consume. Even though RREs disseminated in the earth's crust are not uncommon, *economic* rare earth deposits of sufficient grade are indeed rare. The below illustration, from the USGS, shows the historic production of RREs over a 50 year period:



From 1950-65, monazite, derived from veins and placers in South Africa, India, Madagascar, and Brazil, was the primary rare earth ore. The chief RRE in monazite is cerium. Monazite is radioactive because of the presence of thorium.

In 1949, the most important RRE discovery located in the USA was made by accident, when two prospectors in the Mojave Desert of California, using a borrowed Geiger counter, located a radioactive outcrop they thought contained uranium. Samples sent to the USGS found instead a "worthless" rare earth fluorocarbonate mineral, bastnaesite.

Intrigued, the USGS conducted field investigations which uncovered a 1.4 billion year old carbonatite intrusion containing light RREs. Carbonatites are unusual alkaline intrusive rocks composed predominately of calcite and dolomite. Globally, they often have higher levels of RREs and other unusual elements than average rocks. From 1965 through the mid 1980s, the USA was virtually self-sufficient in RREs because of output from the Mountain Pass mine. However, there were environmental problems with ruptures of a wastewater pipeline, spilling thorium –laced radioactive water, derived from bastnaesite.

The mine was closed in the 1990s in response to both environmental restrictions and lower global prices for REEs, although processing of previously mined ore continued at the site. There are bold new plans for this deposit, discussed below.

The green area on the chart above addresses the production of RREs from Inner Mongolia, China, beginning around 1985 and surging afterwards. China, a low cost producer, literally shut down RRE mines elsewhere by exporting cheap product. Today, China produces about 95-97% of all REEs consumed, from a poorly understood geologic ore type known as lateritic iron-absorption clays. In tropical environments, rocks are deeply weathered to form iron-aluminum rich soil profiles as much as many tens of meters thick. These soils commonly concentrate heavy minerals, leached from previously exposed rock, as residual deposits. In China, RREs are concentrated sufficiently in laterites to produce economic deposits of significant size and grade. These deposits contain both light and heavy RREs.

Granitic pegmatites, very coarse grained rocks solidifying late in the history of an intrusion, also contain anomalous RREs, both light and heavy. Often these bodies are zoned, having a quartz core, with RREs concentrated outward. While many diverse RRE minerals occur in pegmatites, usually reserves are small and therefore have been of primary interest to collectors.

On-going exploration and development efforts include work in Canada, Vietnam, Greenland, Australia, and Alaska.

Geopolitics and the Future

Today global demand for RREs is straining supply. The current Chinese near-monopoly, at a time when our high tech society is requiring more rare earths, is a big strategic concern, having national and global consequences. Furthermore, China has been gradually reducing export quotas, with the plan to continue this trend. China is thought to sell RREs to internal manufacturers for much less than export prices, in order to stimulate internal growth. They have also cracked down on smuggling of RREs. In December, 2010, they introduced new export taxes, essentially telling the rest of the world to "go find your own RREs". Japan's supply from China is especially threatened because of souring relations, and is scrambling to find rare earths elsewhere.

The Mountain Pass carbonatite deposit in California, discussed earlier, is the largest known occurrence or economic light RREs in the western hemisphere, possibly the world. The aerial photo below is from Long et al, 2010. This property, owned by Molycorp, is in the forefront with several recent developments which will impact global supply. In December, 2010, all necessary permits were secured to ramp up production from 3,000 metric tons/year rare earth oxides to 20,000 metric tons/year by 2012. Joint ventures with Sumitomo Corp

Fig. 6. Google Earth Image of the Mountain Pass mining district, California. Molycorp's open pit mine – inactive since 2002 – is at the center of this view; the pit covers about 50 acres and is about 400 ft. deep.

and Hitachi Metals will supply capital and expertise to meet the company's "mine to magnets" stated goal. A new production facility will be built on site to manufacture neodymium iron- boron alloys and magnets.

Another recent development is extraction of RREs from electronic waste. New advances in recycling technology have made extraction more feasible. Mining and refining of RRE ores have significant environmental consequences if not properly managed, due to the common association of radioactive thorium and uranium. Continued possible price escalation, coupled with growing environmental initiatives worldwide, will make recycling of RREs an important part of future supply. Nevertheless, it appears that global demand will significantly outstrip total RRE supply in a few years without major new discoveries.

References

Keith Long, Bradley Van Gosen, Nora Foley, and Daniel Cordier, 2010, The Geology of Rare Earth Elements, republished from: *The Principal Rare Earth Elements Deposits of the United States*: USGS Scientific Investigations Report 2010-5220, http://geology.com/usgs/ree-geology/

Dec 21, 2010, Molycorp and Hitachi Metals Announce Agreement to Pursue Formation of Joint Ventures to Manufacture Rare Earth Alloys and Magnets in US: Business Wire http://finance.yahoo.com/news/Molycorp-and-Hitachi-Metals-bw-414235840.html?x=0&.v=1

Dec 17, 2010, Expert Addresses Rare Earth Element Supply Hysteria: Seeking Alpha http:// seekingalpha.com/article/242518-expert-addressesrare-earth-element-supply-hysteria?source=yahoo

Dec 15, 2010, US at Risk or Rare Earth Supply Disruptions: Rueters News http://www.reuters.com/article/ idUSN1510106820101215?feedType=RSS&feedName=companyNews&rpc=43

Dec 13, 2010, Molycorp Secures Last of Permits Needed for Construction Start of $531 Million Rare Earth Supply Chain Project: Molycorp press release http://finance.yahoo.com/news/Molycorp-Secures-Lastof- bw-942436897.html?x=0&.v=1

Dec 13, 2010, Company Poised to Cash in on Global Demand for Metals, http://www.cnbc.com/id/40645630?__source=yahoo%7Cheadline%7Cquote%7Ctext%7C&par=yahoo

Dec 10, 23010, Molycorp and Sumitomo Agree to USD$130 Million Equity and Debt Investment in Molycorp in Exchange for Rare Earth Supply Agreement: Molycorp press release http://finance.yahoo.com/news/Molycorp-and- Sumitomo-Agree-bw-3807073262.html?x=0&.v=1

Rare Earth Elements-Critical Resources for High Technology, 2002: USGS fact sheet 087-02 The Mountain Pass Mine, date unknown http:// geology.csupomona.edu/drjessey/fieldtrips/mtp/ mtnpass.htm http://www.csms.us/pickandpack/Pick&Pack2011/FEBRUARY%202011%20PICK%20&%20PACK.pdf

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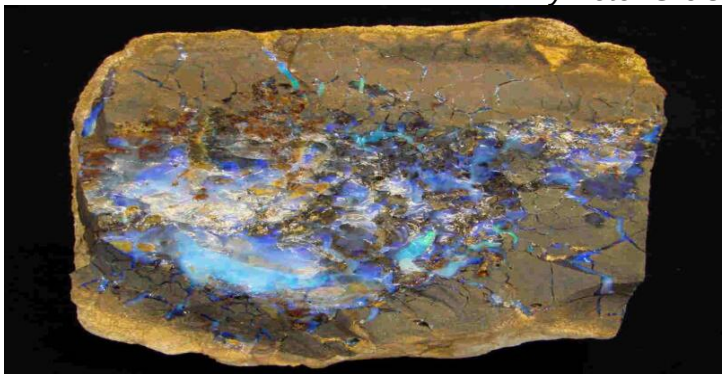
From Rags to Riches

Chapter 36 – Painted Ladies

By Peter Greisl



A glorious Monday morning the weather is getting warmer being on the way to springtime, Johnny has left with all his instructions, and I am on the way to the Shop. I hope that nothing goes wrong anymore. All they have to do is clear out the other side of the tunnel and the draw up a plan of tunnels and shaft location so we can make a calculated decision where to continue obviously if there are some traces. I also told Johnny to dump the level they pulled down before the collapse in hessian bags so he can use the buckets.

They also have to remove a couple of boulders or rocks which supported the roof. I hope there is some material in them.

When I get there this arvo I like to see they had cleaned out everything and a couple Rocks or Boulders to split and most important the map with the tunnels and where we can start another drive.

I got there and low and behold there was Scotty on the winch pulling up a bucket which contains one of the boulders, I nodded a greeting and ask him how is it going, He replied 'everything was cleaned out, we got the two boulders and Johnny prepared the map for you and now he is scratching around to see if he can find any traces' 'Great I said while we wait we can have a look at the boulders to see if there is anything worthwhile.

While we got the Boulders to one side so we can operate on them, Scotty got a Rock Chisel and the Sledge Hammer, and I heard a sound coming from the shaft which sounded like "Holy Shit" followed by this has to be it.

I shouted down 'What's happening' Johnny shouted back get down here and look for yourself' I told Scotty about Johnnie's outburst and told him I am going down, he nodded and said I will work on the boulders I done this many times before. I went down and Johnny was in the new tunnel where we broke through, I looked at the structure firs up and noticed the comforting Gypsum Bands, which made me feel at ease.

'What's all the commotion about,' Johnny smiled and said someone up ther must love us, have al look at that' There were 4 rocks two on top of each other and as Johnny picked away in the center of these rocks to remove them he hit a pocket and again all Natures colours burst forward and hit us in the eye, what a magnificent sight. Out came the screw driver and gently he eased out piece by piece which I licked and looked at and put in my linen bag, there weren't to many but was here was excellent crystal opal, I am estimating about a couple ounces and again it fizzled out to colorless potch but we were left with a seam with fine traces, so we know in which directions we going to drive. I said to Johnny 'I think what we do here is we do a Mushroom drive, as we move forward we also gouge out either side of our drive about 2 feet and 1 foot high, I seen this in one of the Opal books I was reading' It also mentioned that it is not the safest way but if there is strong support either by rocks or gypsum then it should be ok.

Well if we find when we take out dirt and it starts crumbling and dropping then we stop. I said, Johnny agreed and I told him let's see what Scotty came up with the boulders.

We climbed to the top and there was Scotty with about 8 pieces of rock, and he pointed at one particular rock which he split and it was a magnificent painted lady, with a skinny opal face, there was no commercial Value but as specimens they should be ok.

Then he showed us the other one which had a 1 cm thick potch face which turned in to a beautiful colored piece which could have been taken off with a slab saw, and this stuff was very nice it covered an area of about 5 inches square. But there was one thing which was puzzling me, I noticed that on one halve of the rock where the nice opal was there was an area of about 5 square cm missing just few tiny chips there but on the other halve which you would expect the missing opal is there, it was not. So I grabbed these two pieces and held them together and there was a hole there which should not be there if there was no tampering with the surface of these rocks.

I said to Scotty, Did any of the stuff break off when you split the rock?

He replied no, I was very careful and nothing dropped to the floor,'

I nodded and the continued well may be I am dumb, but can you explain that there is some part missing which looks like it has been chipped off and if that did not happen why is there an area which is empty and should not be there when you hold the two rocks together.

I could see Scotty getting flustered, and he shook his head.

I looked at Johnny and he nodded in agreement of my observation.

Unfortunately I got no proof but I am sure Scotty chipped a piece of while we were down below. I disgust I threw the rocks in the bucket and said 'well let's call it a day' By the way I got some news I will have more time available as we have a helper in the shop starting next Monday, So Scotty I suggest you enjoy your last week in peace and relax to be ready when your partner comes back, Johnny can handle the rest of the week with my help.

Scotty replied, actually I was going to tell you that I like to spend the rest of the week relaxing and just vegetating' I knew that Scotty that's why I mentioned it.

"Well thanks mate, for your help sorry nothing came out of it but such is life"

Scotty nodded and got into his car and drove off.

I was very angry and I took my anger out on Johnny,

I said to him, 'no more partners or helpers, and if you can't manage then maybe you have to look for another alternative.' He replied, don't talk bloody rubbish, you know I am ok with it and forget about it, what he nicked, so maybe he gets a couple hundred for it, but he gets nothing what we took out this afternoon as we never showed what we had' I hat cloak and dagger situation, If I ask someone to come in then he should get what we produce, but in this case I have to o against my principal, when people steal from me I forget my upbringing.

'Johnny if you should ever get the notion of trying to pull the wool over my eyes, I tell you my friend I love you like my brother and trust implicitly but you can also rest assured I would bury you in one of these shafts.'

He replied, the feeling is mutual, you never bite a hand that's feeds you, I got no notion in doing anything to hurt you or Chris, you are my family.'

Great Mate lets pull the pin and go and have a beer I have to wash my anger down.' You are like a bear with a sore head' Johnny replied.

I hate to be taken for a Mug.

We packed up everything and we went to Gus's place for a quick drink.

As we arrived I noticed Scotties car there, we walked in and Scotty was standing at the bar with his back towards us and he was involved in conversation with another bloke, and he had something in his hand which he handed the other fellow. I walked up quietly right next to him and said 'good day mate, showing off you ill-gotten gains' the other fellow looked at me and had the piece in his hand and it was the missing part from the painted lady.

Scotty stammered I just was showing a piece we got from German Gully before Mike my partner left for his holiday' I said to the fellow can I have a look and he handed me the piece and I said to Johnny ' what does that resemble' This is the missing link in a the theft made by one of Andamooka's crooks this afternoon.' And Johnny said this very loud so everyone in the bar could hear it and looked up towards us. The fellow next to me looked perplexed, I said 'I should keep this piece as it is rightfully mine, if there is any doubt about it I can go out and get from the Ute the piece of rock where it would fit perfectly like a piece of a Jigsaw Puzzle.'

Scotty then in his defense stammered, I only took it in case I did not get any of my share,' First of all there is no share as we did not find anything, secondly you should have asked if you worried if we sell the stuff so you could get some money, finally you were trying to have us quit on the claim with your stupid information you gave Johnny after the collapse, so you could move in and work it, Scotty the best thing is you take this bloody piece and you piss of out of here and don't ever cross my path, you can be sure I will tell everyone that you stole opal from me, you finished on the field.

I threw the piece at him and said piss off or I throw you out.'

He picked the piece up which fell to the floor and turned around and left.

Gus came over and asked me what this was all about, I told him and he said Have a beer on the house to calm you down, I thanked him and we had our beer and we left. We went home it was about 6pm and we had a quiet and pleasant evening with making plans for the attack, I told Johnny to gouge and we pull dirt when I get there. I studied the plan Johnny drew up and I could see a couple alternatives if this way does not work out but we should be able to drive in the directions of traces for at least twenty feet.

So another day closes with some action, this kind of action I don't need but we have a few pieces of nice opal which Chris is drooling over it, also we have the painted ladies plus we have a couple hessian bags full of material which has to be tumbled, all in all it was not too bad of a day.

++

July 2013 Gem & Mineral Shows

More shows can be found at http://www.rockngem.com/show-dates-display/?ShowState=ALL

July 2013

4-7—SISTERS, OREGON: Annual show; Jean Miller; Sisters Elementary School; 611 E. Cascade (off Hwy. 20); Thu. 9-6, Fri. 9-6, Sat. 9-6, Sun. 9-4; free admission; contact Jean Miller, PO Box 136, Molalla, OR 97038, (503) 829-2680 ; Web site: www.ogmshows.com

5-7—EUGENE, OREGON: Wholesale and retail show; Gem Faire Inc.; Lane County Events Center; 796 W. 13th Ave.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults and students (12 and up) $7, children (11 and under) free; fine jewelry, gems, beads, crystals, silver, rocks, minerals, exhibitors, on-site jewelry repair; contact Yooy Nelson, (503) 252-8300 ; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

5-7—FARMINGTON, NEW MEXICO: Annual show; San Juan County Gem & Mineral Society; Civic Center; 200 W. Arrington; Fri. 10-6, Sat. 10-6, Sun. 10-5; free admissions; hourly door prizes, silent auction, raffle, black light display, kids' Wheel of Fortune; contact Mickie Calvert, 5986 Hwy. 64, Farmington, NM 87401, (505) 632-8288 ; e-mail: mickie2@earthlink.net

11-14—CASCADE LOCKS, OREGON: Show and sale; Cindy Allison; Marina Park; 355 WaNaPa St.; Daily 10-5; free admission; rock slabs, minerals, beads, jewelry, wire wrapping, Oregon sunstones, cabochons, faceted stones, fossils, rock cutting and polishing machines, rock grabbers; contact Cindy Allison, 87987 9th St., Veneta, OR 97487, (541) 554-2863 ; e-mail: gemsareus2@yahoo.com

12-14—PORTLAND, OREGON: Annual show; Gem Faire Inc.; Oregon Convention Center; 777 NE MLK Jr. Blvd.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults and students (12 and up) $7, children (11 and under) free; fine jewelry, gems, beads, crystals, silver, rocks, minerals, exhibitors, on-site jewelry repair; contact Yooy Nelson, (503) 252-8300 ; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

13-14—CASPER, WYOMING: Annual show; Natrona County Rockhounds Club; Parkway Plaza; 123 W. E St; Sat. 9-5, Sun. 9-4; adults $3, children (under 12) free; demonstrations, door prizes, raffle, silent auction; contact Helen Hoff, PO Box 123, Mills, WY 82644, (307) 266-2839 ; e-mail: hmhoff@bresnan.net

13-14—CULVER CITY, CALIFORNIA: Annual show; Culver City Rock & Mineral Club; Culver City Veterans Memorial Auditorium; 4117 Overland Ave.; Sat. 10-6, Sun. 10-5; free admission; club displays and exhibits, Kid Zone, craft demonstrations, more than 25 dealers, gems, minerals, fossils, rough, slabs, jewelry, tools, beads, silver castings, wire-wrap, carvings, glass work, polished cabs, jewelry displays, free hourly door prizes, grand prize raffle; contact Rick Shaffer, (310) 391-8429 ; e-mail: info@culvercityrocks.org; Web site: www.culvercityrocks.org

19-21—LYNDEN, WASHINGTON: Annual show; Gem Faire Inc.; NW Washington Fair & Event Center; 1775 Front St.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults and students (12 and up) $7, children (11 and under) free; fine jewelry, gems, beads, crystals, silver, rocks, minerals, exhibitors, on-site jewelry repair; contact Yooy Nelson, (503) 252-8300 ; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

19-21—REEDSPORT, OREGON: Annual show; Lower Umpqua Gem & Lapidary Society; Reedsport Community Center; 451 Winchester Ave.; Fri. 10-5, Sat. 10-5, Sun. 10-4; free - donations appreciated; "Treasures From the Earth": dealers, jewelry, gems, minerals, demonstrators, displays of gems and minerals, door prizes, silent auctions, raffle, demonstrations, cabochon making, wire wrap jewelry, soapstone carving, glass bead making, kids' activities, “turn me over rocks”, ball toss, thunder egg cutting, fluorescent rock display; contact Bill or Virginia Hendrickson, 69833 Stage Rd., North Bend, OR 97459, (541) 271-6816

20-21—DARRINGTON, WASHINGTON: Annual show; Darrington Rock Club, Marysville Rock Club; Mansford Grange Darrington; 1265 Railroad Ave.; Sat. 10-5, Sun. 10-5; free admission; field trip, sales, local jade, cutting and polishing, demonstrations, displays, free kids' rocks, grab bags, Washington rock site maps, used and new tools; contact Edward Lehman, 9120 20th St. SE, Lake Stevens, WA 98258, (425) 760-2786 ; e-mail: wsmced@hotmail.com

26-28—SPOKANE, WASHINGTON: Annual show; Gem Faire Inc.; Spokane County Fair & Expo Center; 404 N. Havana St.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults and students (12 and up) $7, children (11 and under) free; fine jewelry, gems, beads, crystals, silver, rocks, minerals, exhibitors, on-site jewelry repair; contact Yooy Nelson, (503) 252-8300 ; e-mail: info@gemfaire.com; Web site: www.gemfaire.com
Web site: www.thegemexpo.com

27-28—KALISPELL, MONTANA: Annual show; Northwest Montana Rock Chucks; Flathead County Fairgrounds; 265 N. Meridian; Sat. 10-6, Sun. 10-5; adults $1; indoor show, dealers, minerals, fossils, rough slabs, fine and costume jewelry, beads, demonstrations, kids' activities, displays; contact Milah Gano, PO Box 433, Lakeside, MT 59922, (406) 844-3560 ; e-mail: mallards_g@hotmail.com

27-28—TENINO, WASHINGTON: Annual show; Washington Agate & Mineral Society; Parkside Elementary School; 301 Central Ave. E ; Sat. 9-6, Sun. 9-5; free admission; contact Daniel De Boer, 5107 Brenner Rd. NW, Olympia, WA 98502, (360) 584-0901 ; e-mail: keylock1@live.comJuly 2013

American Opal Society Membership Application

FILL IN APPLICABLE INFORMATION		DUES / FEES)	AMOUNT PAID
DUES: SELECT ONE	RENEWING MEMBERS	$30	
	NEW MEMBERS	$40	
INTERNATIONAL MEMBERSHIP FEE (All addresses outside of USA)		$10	
PRINTED NEWSLETTER FEE (Paper copy postal mailed instead of PDF file by e-mail)		$5	
ADDITIONAL BADGES (Your First Badge is free when joining)		$10	
TOTAL PAID DUES plus International, Print or Badge Fees if Applicable:			

Please make check or money order payable to "*American Opal Society*". Mail payment and application to:

American Opal Society; PO BOX 4875; Garden Grove, CA 92842-4875

An optional, quicker method of payment is via the Internet. To pay, just visit the membership page on our website at http://opalsociety.org/aos_application_by_web.htm and complete the form. You may pay with a Credit Card or via PayPal account. The transaction is completely secure and the AOS never sees your credit card number. The AOS PayPal account is membership@opalsociety.org.

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OCCUPATION	HOBBIES AND INTERESTS	

NAME BADGE ORDER FORM: PLEASE PRINT NAME AS YOU WISH IT TO APPEAR ON YOUR BADGE using up to two (2) lines of text for your name, nickname, or name of your opal related business.

MEMBERSHIP ROSTER: The AOS publishes a membership directory once per year in its Newsletter, the *Opal Express*. Your name will be included. Please check what additional personal information that you want listed for other members. If it is different from the information above, please note that on the application.

☐ Address ☐ Phone ☐ E-mail ☐ Website

Please sign here: _____ Date _____

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Are Your Dues Due Now?

PLEASE CHECK YOUR ADDRESS LABEL or NEWSLETTER E-MAIL. There should be a date that shows the current month/year of your membership. If the date is older than the current date, your dues are overdue. A warning will be stated if you are overdue.

A Renewal Grace Period of two months will be provided. Please note, however, that as the system is now set up, if your renewal is not received you will be AUTOMATICALLY dropped from membership thereafter. It is your responsibility to assure your dues are current.

Thank you,

The Editor

The Opal Express
American Opal Society
P.O. Box 4875
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Volume #46 Issue #7
July 2013

TO:

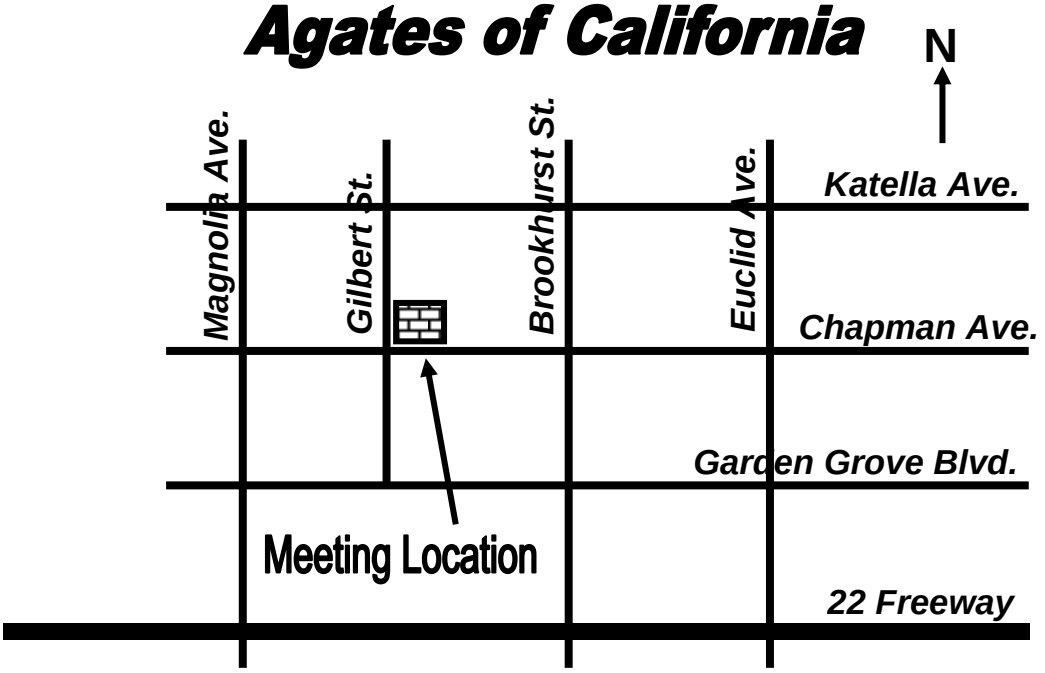
Some Topics In This Issue:

- **Opal from the High Plains**
- **The Geology and Global Politics of Rare Earths**
- **From Rags to Riches – Ch. 36 – Painted Ladies**

Important Dates:

- ***July 11 - General Meeting:***
  Justin Zzyzx on Agates of California

July 11 Meeting
Justin Zzyzx on
Agates of California



— *GENERAL MEETINGS* —

2nd Thurs. of the Month
7:30 pm - 9:30 PM

Garden Grove Civic Women's Club
9501 Chapman Ave.
Garden Grove, CA 92841
(NE corner of Gilbert & Chapman)

MEETING ACTIVITIES
Opal Cutting, Advice, Guest Speakers, Slide Shows, Videos, Other Activities

The American Opal Society
http://OpalSociety.org

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