

The Opal Express

American Opal Society
P.O. Box 4875
Garden Grove, CA 92842-4875



**Volume #38 Issue #6
June 2005**

TO:

Some Topics In This Issue:

- Book Review - Gemstones of the World
- A Field Trip to Australian Opal Country, Part 4
- Mineral Quiz, Part 2
- Carving Fire Agate
- What Are the Sugar and Smoke Treatments of Opal
- Quartz Color Causes

Important Info:

**Board Meeting
June 7th**

**General Meeting
June 9th**

Lecture: June 9th Lecture - Daniel Toledo on "Creativity & Originality in the World of Opal Jewelry"

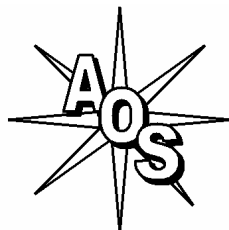
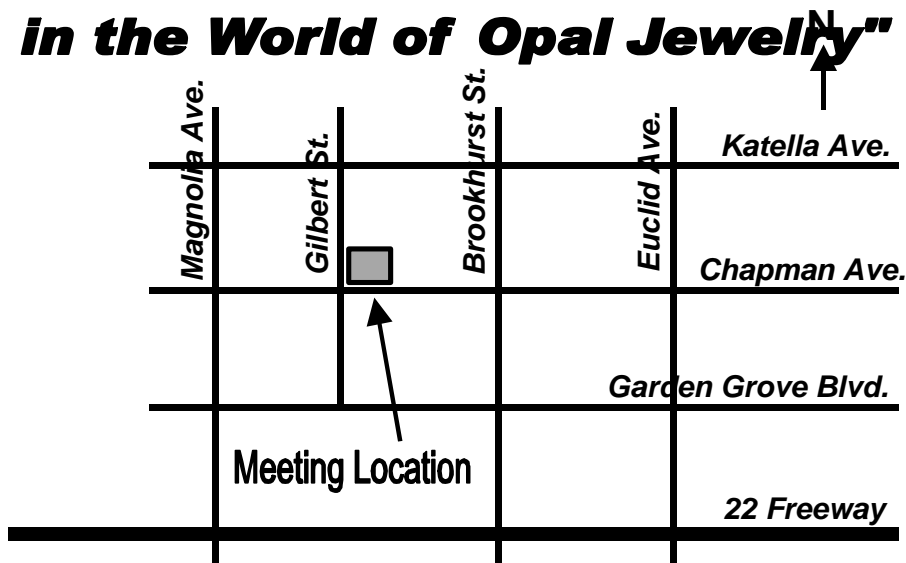
June 9th Lecture: Daniel Toledo on "Creativity & Originality in the World of Opal Jewelry"

— **GENERAL MEETINGS** —

2nd Thursday of the Month
7:00 pm - 9:00 PM
Garden Grove Civic Women's Club
9501 Chapman Ave.
(NE corner of Gilbert & Chapman)
Garden Grove, CA

MEETING ACTIVITIES

Opal Cutting Advice Guest Speakers
Slide Shows Videos Other Activities



The American Opal Society

<http://OpalSociety.org>

Walt Johnson	President	(714) 533-1287	email: donnawalt@msn.com
Eugene LeVan	Vice President	(562) 621-1805	email: fineblackopal@sprynet.com
Russ Madsen	Treasurer	(562) 884-2254	email: chairman2rgm@cs.com
Fran Todd	Opal Show Chairman	(310) 721-5614	email: toddle@aol.com
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MEMBERSHIP ROSTER and NEWSLETTER MAILING: 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.

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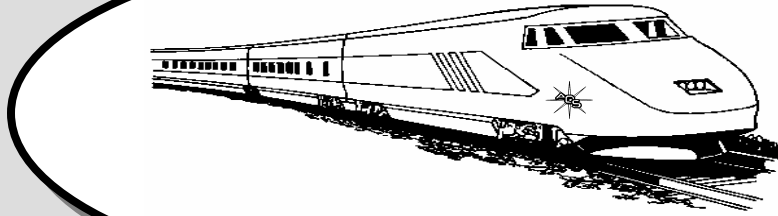
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Jim Pisani
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PLEASE CHECK YOUR ADDRESS LABEL. If your label shows the current month/year your dues are DUE NOW. If the date is older, your dues are overdue.
A Renewal Grace Period of two months will be provided. If your dues are due now you will receive two additional issues of the newsletter. 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

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June 2005

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June Speaker - Daniel Toledo

The lecture June 9th general meeting will be by Daniel Toledo on "**Creativity & Originality in the World of Opal Jewelry**".

Bio - Daniel C. Toledo is a wildlife artist of 30 years. His passion for wildlife sparked while serving for the U.S. Marines in the jungles of South Vietnam during the late 60's. He began his career as a wildlife artist specializing in predatory animals, such as big cats, bears, birds of prey, and the noble creatures. His compositions reflect an extensive study of the animal's anatomy and their habitat. He was a student of the Art Center College of Design in Pasadena, California and the Gemological Institute of America where he attained his diploma in jewelry arts in 1979. He has done many shows in the western United States and his works are in private collections throughout the world. Wildlife jewelry is at the forefront of his commissioned work today. At present, he is in the process of completing a 20 piece collection (which includes 6 major necklaces) for a wildlife art museum in the San Francisco area which will be opening at a later date. In 2002, Daniel was invited to participate in G.I.A.'s museum exhibition held in the Mikimoto Rotunda, "In Celebration of Precious Wildlife." A collection of themed jewelry from the Victorian era to present day was shown. Fourteen pieces of Daniel's jewelry represented some of today's most current wildlife jewelry. These pieces were from the above mentioned collection. Daniel has also been a judge for the past two years for the George M. Schuetz Design Competition at G.I.A.

"My philosophy behind my work has always been to create the creatures I portray as realistic and unique in design to captivate the heart, because these works serve as ambassadors to the public."

May Speaker Review- Lothar Vallot

The AOS gives a big THANK YOU to Lothar Vallot for his excellent lecture at the May General Meeting. Lothar gave an excellent talk on gemology. He discussed various methods of identifying different gemstones and the science behind it. He had a number of instruments that he demonstrated how to use, such as the refractometer and polariscope. After his talk, he identified

various gemstones of that the members had brought in. He was well received by the members and we had a record turnout.

Lothar is the head of the Gemology Department at Santiago Canyon College and teaches a number of courses there. After his lecture last month, I believe he will have a number of new students from the AOS!

Here is Lothar's contact info:

Otten, Vallot & Co.,; Address: 15131 Triton Lane #117, Huntington Beach, CA 92649; Phone: (714) 893-6643; Website: <http://www.ovdiamonds.com>, E-Mail: ovdiamonds@aol.com

Book Review - Gemstones of the World

By Mike Kowalsky

Hi All. I haven't written for the Opal Express in a while but I came across something that I feel I must share with our members. Last month I went to a local Gem Show and ran across an excellent reference book that many of you may want to purchase. It is used as a reference book by some of the courses that teach gemology. I was informed that this is the reference book used in Instructor Lothar Vallot's courses at Saddleback College of Orange County, Southern California. I found the descriptions of opal were the most thorough of any reference book I have read. The descriptions include the chemical composition, the range of hardness, cleavage and fracture characteristics. Other characteristics such as refraction index range and fluorescence are provided. The color plate displays a wide range of opal types in very accurate colors.

You can look up all the other gemstones of the world for all the characteristics you may want to know about. For the price of \$24.95 this is a reference book you will treasure for all the information that it contains. At this time I don't know of any of the Opal book dealers that carry this book. I spoke to Steve Newstrom of the Village Smithy and he will review it and determine if he will carry it.

"**Gemstones of the World**"; Walter Schumann; Sterling Publishing Co., Inc. New York; ISBN 0-8069-9461-4

Membership Roster Questionnaire

The American Opal Society has published yearly a membership roster but not recently. There is definite benefit for the members to know who their fellow members are and how to contact them. However, in this age of identity theft, spam, and security issues there is concern over the privacy on the members with their personal information.

The board is considering sending out a questionnaire in the near future to the members on determining if a publicized roster is a worthwhile endeavor. Questions will be asked as whether or not a roster is desired, what information would be on it, and where it would be published.

Any inputs from the members on this topic are encouraged. Please send comments to webmaster@opalsociety.org.

New Updates to the AOS Website

The AOS Website, <http://opalsociety.org>, has been updated in two ways. First, the search engine now works with the Opal Express Archives. This allows members to perform keyword searches on the over 120 on-line Opal Expresses going back to 1976. In the past, pdf file versions could not be searched.

Second, the on-line application web page now allows payment directly to PayPal.com, making it easier for members to pay their dues or a new member to join. Please visit the website – there is a wealth of information on opals and gems in both the Newsletter archives and the Opal Discussion Forum.

Mineral Quiz, Part 2

(See May Newsletter for Part 1)

Match the Term (number) with the Definition (letter)

1	Igneous Rock	A	Rounded, kidney shaped mass
2	Inclusion	B	With luster like that of silk
3	Iridescence	C	Outline of an object can be seen through it
4	Massive	D	With luster like that of broken glass
5	Matrix	E	Without definite structure or form
6	Metamorphic	F	Crystal like double pyramid base to base
7	Nodule	G	Coarsely crystallized igneous rock
8	Octahedral	H	Sedimentary rock formed of hardened clay, usually in thin layers
9	Opalescent	I	Crack in rock filled with mineral
10	Opaque	J	Rounded, irregular shaped mass
11	Pearly	K	Formed by solidification of a molten mass
12	Pegmatite	L	Metamorphic rock that splits into thin sheets
13	Pocket	M	Unable to pass light
14	Prism	N	Foreign matter in a mineral
15	Pseudomorph	O	luster like that of rosin Replacement of one mineral by another in which the form of the first mineral is preserved
16	Reniform	P	Cavity in rock
17	Resinous	Q	Crystal formed of more than one individual crystal and symmetrically intergrown
18	Schist	R	Crystal with faces parallel to one axis and intersecting other two axis
19	Sedimentary	S	Passes light but not the outline of an object
20	Shale	T	Shimmering peacock like play of colors
21	Silky	U	Rock in which a crystallized mineral is embedded
22	Slate	V	With pearly reflections like those of opal
23	Tabular	W	Tablet like
24	Translucent	X	One formed of clay, sand and other debris
25	Transparent	Y	Metamorphic rock with leaflike structure usually containing much mica
26	Twin	Z	Luster like that of mother of pearl
27	Vein	AA	One altered by heat, pressure, liquid or gases
28	Vitreous	BB	

Answers on Page 8. From the Flatirons Facets, 8-2003

A Field Trip to Australian Opal Country, Part 4 or An American Opalhollic in Paradise

By Margaret Malm

This is part 4 of 4 of Margaret Malm's travel log while touring the opal fields of Australia with AOS member Barbara McCondra's tour group. It was written for The Lapidary Digest, a defunct Internet discussion forums, Edited and Published by Hale Sweeny (hale2@mindspring.com). This excerpt is from Issues No. 276-279, 5/21/2000 - 1/13/2001. The Editor

G'day, all!

OK, I promised to tell you about Len Cram's opal-growing process. We began our visit with the usual offer of coffee or tea, and "bikkies" (cookies to us); and a little informal chat. I don't really know whether that is the traditional way all opal-sellers greet the (commercial) opal buyers, or just traditional Aussie hospitality. And then, after that, the opals come out. And he has some real dandies. then he led us out to a rather small shed in the yard -- tin, of course; the termites eat wood up in jig time. And there, along one side, were shelves with row upon row of jars sporting a thick layer of opal in the bottom; every test he has ever run, each carefully labeled (in code) with just how it was done. Everything from plain potch to some really gorgeous stuff.

His first experiments were done during 1960-75. It was not until 1975 that he achieved color, and it was "just by accident" that he achieved just the right composition, and the right amount of LIGHT. He started first with a small opal "seed" (of Coober Pedy-type opal), plus silica, a little aluminum oxide (since Aussie opals contain 1.5-2% of this), and "some electrolytes". The nature of the electrolytes is, he said, the secret to it all, and of course he is not telling what they are! And of course there is more to it than that.

This same shed contains his capping equipment, and he set the jar aside and sort of forgot about it. One day some time later he just happened to spy it as he was doing some capping, and, he said, "I was astounded!" It had turned to a whitish gel. He removed the top, and poured the leftover water off. Over time it developed mud cracks, then became color-layered, and then finally white potch. This, then, was the starting point for the rest of his experiments. And he found, in essence, that while the atoms are identical, the structure is different. In agate they're a hodgepodge; in opal they are very regularly arranged.

But how to get such an arrangement? He next tried a process where, instead of using an opal "seed", he started with local "opal dirt", finely ground. [Opals in Lightning Ridge are found in a shale layer.] Add water and shake, then add the electrolyte. He ended up with patches of opal all through the dirt. Siphoned off the water. After a few months -- lookie! It's ALL opal! He said, "I broke off the glass and just gazed at it." Then, "I took it to my wife, and said 'I've just turned dirt into opal!' And she looked at it and said, "Oh. It is a bit different, is it?"

To achieve the color, he experimented a bit with organic (alcohol-soluble) dyes, as he heard Gilson was doing that in their man-made opals. And he had some success. but he decided that he wanted to find out how to do it without dyes. If Mother Nature can, why couldn't he do it? Naturally? And he wanted to make the famous Lightning Ridge BLACK OPAL. And he has succeeded!

Someone (Leigh, I think) asked a question about "cracky" opal, which brought out more very interesting information.

He studied "mountain" - i.e. "volcanic" - opal vs. sedimentary opal; they are entirely different. Why doesn't the really dry ground just suck the soil out of the opal, which has many times more water in it than the ground?

Because of the temperature it formed at, it requires a temp of 600-800 degrees C. to start moving the water out of the volcanic

opal; but only about 60 degrees C. for the sedimentary. But water won't keep "cracky" opal from cracking. Electron microscope studies show the interstices of volcanic opal are full of "material", yet in sedimentary opal it is only maybe 20% volcanic opal has the color IN it. Sedimentary opal has the color ON it. And, opals are not solid, they are liquid.

It is actually an ION EXCHANGE PROCESS. LIGHT is what cracks crystal -- or, actually, atom migration; atoms moving around to achieve balance. A process catalyzed, in this case, by light. It is a slow process; it takes time to achieve equilibrium, but GRADUALLY the natural "vibrations" slow down. Which is while the opal does not crack immediately. He has been able to get the atoms to re-migrate, and even "heal" the cracks, but it does leave a little potch scar.

So, the more you handle "cracky" opal, the longer it will last, (presumably because the alternations of light and dark keep the "vibrations" going.)

He also said that you should put the "cracky" opal in mineral oil; after 5-6 years he figures it will probably become stable. And BTW, the "store your opals in mineral oil" recommendation seems to be the general one I've heard in Australia. Not in water, not in glycerin; in MINERAL OIL.

I asked him about whether the opals he grew needed to have darkness (they are in a rather dark shed). He said they would probably grow faster in the dark.

"So, how do the 'nobbies' form?" ['Nobbies' are the Lightning Ridge opal] First, we must know that millions of years ago, there was a vast sea covering most of Australia. His theory: there were cavities left in the seabed, and water containing 120 ppm silica seeped in. There was a dry period, followed by another sea. And more siliceous water seeped into the cavities. And so on. It gradually built up, and filled the cavities.

Any "rubbish" left behind would have been in the bottom of the cavity. It gets distributed around by molecular action. But not always equally. The more rubbish present, the "higher" in the spectrum (towards reds) the color will be. Less rubbish yields blues.

And, he says, there is only a certain amount of electrolyte. Once it's used up the process stops. The spheres in the red layer are also larger (1/300 millionth) than those in the blue (1/600 millionth), so they tend to settle and the blue ones to rise.

A bit more of Len's Lightning Ridge geology: (and Lightning Ridge actually is on a ridge, and was so named when a shepherd, his family, and herd of sheep were caught up on top in a lightning storm and all killed) -- the ridges are like a really huge chasm that was filled. And the opal occurs only in these ridges. [Their bore goes down 3400 ft. to water, is only 400 yards from opal country, but in the "black soil" -- not the Ridge]. The opal country runs 500 non-stop miles, by 300 mi wide in some places; and also includes Coober Pedy, Andamooka, and White Cliffs.

He thinks that MOST of Australia, or at least the western part, is underlain by opal. But is now tied up in "native claims". (This is a big "give the land all back to the Indians" type process Australia is going through now.)

Len's secrets will die with him. The main reason he has not continued his research is that he firmly believes that he would've eventually been able to make (man-made) opal that could not have been distinguished from the native opal. And this would, of course, totally wipe out the opal industry in Australia.

He is now in the process of writing quite a number of books about Australia's opals, illustrated with photos he has taken of a lot of the really gorgeous and famous opals of Australia. they are becoming collectors' items; I hear some sell for as much as \$800 nowadays.

He showed us his photography setup -- he uses a copy stand with 2 hard lights on each side to get completely flat lighting, plus a smaller hand-held one used to eliminate any shadows. The opal is placed on a glass plate, positioned so that the "flow" is left to right

("that's how our eye and mind work"); and cloths of various colors (whatever he wants for the background) are spread far enough below to be out of focus. He occasionally shoots out of doors too, using Velvia Professional; this film gives super-saturated colors and is not for "normal" photography. Adobe Photoshop to "massage" his scans..

And his recommendation for a polish for the "nobbies": equal parts of Tin and Cerium oxides plus a little borax, on leather.

If you want to contact him for further info, or autographed copies of his books, address is 8 Pandora St.; Lightning Ridge, N.S.W. Australia 2834.

Other Odds And Ends That May Be Of Interest:

They have some really funny signs in Australia. The one I liked best cautioned drivers to PLEASE DROP YOUR DUST BEFORE ENTERING TOWN." On a dirt "track", of course. Aimed mainly at trucks, and refers to the big boil of dust that follows behind a vehicle in the vacuum it creates, especially a large vehicle. So, they are to stop and let it settle, and then proceed!

In some towns (mostly the smaller ones), when angle-parking, you back in! Great idea, we should do it that way too, as if you have to back out you really can't see what's coming until it's too late.

Many houses are built up on stilts. this is not mainly in case of floods (although in some cases it does come in very handy that way!). It is mainly for ventilation underneath, and some insulation from the hot ground; and protection from the snakes. they have many different kinds of snakes in Oz, and most of them are poisonous. And I mean kill-you-really-quick poisonous! Some of the most deadly ones in the world. In Yowah, we encountered a few homes with the door threshold built up, up to 2 feet high, that you had to step over to enter.

At Trafford's house (Barbara's friend and partner), he showed us a snake (actually two of them) in a jar, that had been found lying between the screen door and door, and which had prompted the construction of the snake barrier. Second-most poisonous snake in the world! And not all that big, either. And on the road, nearly in front of Barbara's home, we saw a Brown snake that someone had prudently run over. And it kept getting flatter and flatter every time we saw it! Very, very deadly. Ah, well. There's always got to be SOME drawback to Paradise!

And then there are the "bindies". Oz has a lot of deserty plants, many quite stickery, and they do get into your socks, and shoes. Usually, in Yowah at least, when you go into someone's home you remove your shoes first, to leave the bindies outside instead of in the rug. Gwen (Barbara's friend and helper, miner, and seller of lots of great Yowah Nut cabs to all of us) has a little dog named Bindy. Cute. Loved to be scratched. And would lay down on its back (or stomach) on the rocks and skootch back and forth to scratch. And get rid of the bindies. It also helped her mine, of course!

Sometimes they encounter serious drought conditions in the Bush, and the forage all is eaten and does not regenerate with no water. So some take their herds (now mostly cattle, very few sheep any more) to the "Long Paddock" -- the shoulders of the road. This is entirely legal. And they may go hundreds or even thousands of kilometers along the roads, with their drovers (herders) following along. Barbara told of one time seeing a fancy wagon for the drovers that was being pulled by camels! (Yes there are some camels in Oz, and they are wild ones!). They pulled over and got out to take a picture, only to be shooed back in by the drover, "that one up there in front is not well trained, he can be very nasty!" So they went on. A few days later they read in the paper that the camel driver had been arrested for "driving a camel while drunk"!!

I forgot to mention earlier that the newest field in Lightning Ridge is Mulga.

If you're looking for the best prices on opal at Tucson, etc., look for a roving Aussie. Without a booth. He will have the best prices, as he doesn't have to pay for the booth, and staffing and so on.

We were not able to get to Koroit, due to road conditions. But we did find a few Koroit slabs at one place in Yowah. It is considered boulder opal, rather than nuts, but to my inexperienced eye it looks enough like the Yowah nuts to be indistinguishable to me. It does generally have some small pits in it, but they are generally not too noticeable, and they can't be ground or polished out without also grinding away the opal. So it is standard procedure to just ignore them. He said that when polishing it, it should be done with 15000 or higher diamond, as things like Tin or Cerium oxide end up in the pits, and cannot be removed -- and it makes them very noticeable.

Rumors spread VERY fast in the Bush. When we got to Lightning Ridge we went, first thing next morning, to the office where they register the claims they've "pegged", in order to get some information folders that they had inside. We arrived a little before they opened and stood and waited for a few minutes before it opened. This office is NOT in downtown Lightning Ridge. Yet within a day or two Barbara was picking up rumors all over town of a new "rush" -- and all attributable to us! The person was very insistent: "New rush somewhere around; Eskimo Nell has brought in a whole mob of people to peg claims for her!" This jumped-at conclusion probably dates back to the time when a man actually did do just that; he actually put ads in the papers for people to peg claims for him, and brought in a busload to do so.

And when we arrived in Yowah, the Bush Telegraph very quickly spread the word all over town; "Eskimo Nell is here with a new mob, and they look like good ones!" And were all eager to meet us.

The open pit mines in Yowah are generally started by using a big backhoe to dig a trench about 1 1/2 ft wide. They keep going down until they reach a layer of nuts, and the mine then spreads from there. The trench may be as much as 40 ft deep. You can usually still see the trench at one end of side of the pit.

In Lightning Ridge, the "Wyoming" field (named for the "station" is was located on), was where the nature of opal prospecting changed. Up 'til then, they had been boring the 3 ft diameter shafts (that you go down via a ladder to get into the mine) when prospecting. Then, with Wyoming, someone came up with the idea of using a 6-8 inch drill for the prospecting, this makes it easy to outline the deposit, so you know just where to peg and then go in and register it and sink their shaft and go. Much faster, much less expensive, much more accurate.

Lightning Ridge black opal is not always really black; certain darker shades of gray can also legally be called black. But the gray ones mostly look sort of faded, to me. There is other precious opal found there, too. And also non-precious opal; in the jars of "rough" I bought there is a plentiful amount of a crystal opal with blue blotches in it. We were shown how putting a black backing on it makes a really lovely cab, although without the "fire". The opal is found in a layer of a sometimes rather clayey shale which can be fairly hard stuff.

In Yowah, Koroit, and, of course, the Queensland boulder opal fields, it is found in an ironstone, and they have to be cracked open (like nuts, hence the name, I suppose) to find out whether or not there is any opal in it. (Seldom is! You generally crack hundreds of nuts before finding one.) On many that I cracked, I found that millions of years ago it did have opal, and probably very pretty. But it had entirely dried up into nothing.

We arrived in Australia right after the summer rains had finally stopped. The rivers in the bush were flooding. The Australian bush country is VERY, very flat. The Paroo River, which kept us from Yowah and made us go to Lightning Ridge first) was 4.5 meters over its bridge. The bridge in this case is a fair distance above the river (maybe 5 feet). But that 4.5 meter depth spread out several MILES on each side into a large lake. It took the flood boat Barbara came out on (to meet us) 30 minutes to get across. And the water level was just staying the same; not going down, although it was no

longer raining up "above". Problem was that there was so much water down below that there was no place to drain to. Lake Eyre, a usually dry lake, was such a sight that they were running small plane flights for people to admire this spectacle.

But when the Paroo finally started dropping (the day we headed over there) it went down so fast it must've looked like the water running out of a bathtub.

Our weather was great. Sunny, just the right temp. A bit chilly at night.

Guess that's about all. Ta!

Margaret kadok@redrock.net

+++++

Carving Fire Agate

By Lou Thorpe

The most important thing to remember before you even start is to select a good piece to work with. Carving is a very demanding aspect of the lapidary field. It requires patience, patience, patience. It is a time consuming venture into the unknown. You do not want to waste days or weeks working on an inferior piece of material. True, there is a chance you may destroy a beautiful layer of fire, but if this happens then go deeper and you may uncover another layer that is just as sensational. Keep this in mind and don't be afraid to dive in.

The first step is to remove the layer of chalcedony that usually adorns the top of the fire layer. Remove this carefully. If the layer is thick you may wish to use a trim saw to partially remove some of the excess. Be very careful about trying to remove too much in this manner as you may be removing some fire also. I always leave some chalcedony - for two reasons. Number one is because you may wish to incorporate a portion of the chalcedony in the design. Number two is that the fire agate is botryoidal and part of the fire "bubbles" could extend up into the chalcedony. After removing as much as possible or advisable, be sure to clean the stone thoroughly. Just as in any other cutting process, all oil or coolant should be removed. The next step is to go to the hand tools. I use a Foredom Flex Shaft with a flexible hand piece #8AD. There are several very good motors and hand pieces on the market, but in this article I am giving you the machines, tools and equipment that I work with. Always keep in mind that I am not endorsing any particular product. Before starting the actual grinding with your hand piece, you must have bowl or container of water beside your workspace. The stone must be worked wet at all times. I like a lot of extra work but my bowl is low and I use a block of styrofoam approximately 5" X 5" X 3" high as a support and steadying device. By resting my hands at the "heel" area above the wrist (on the block) it is a very simple matter to swing my hand over to the bowl of water and back to the business of grinding. This is my way of doing it. Anything that feels right for you is the way to go. Just keep that stone wet.

You must get down to the brown material which encompasses the fire layers. This is accomplished by using a heavy duty diamond sintered wheel. My preference is a 1/2" wheel. Through experience I have found the sintered wheels do an excellent job and do not have to be replaced as other types. I would also like to note at this point another reason I use diamond sintered wheels is because they work much faster than the silicon carbide or aluminum oxide points. As a beginner you can use the above mentioned points and turn out a beautifully finished product, it will just take longer. If you see that carving is for you, something you really enjoy doing, invest in the diamond points. It is an excellent investment.

You do not need a wide variety of points to begin with. I started with a 1/2" heavy duty wheel; 1 diamond thin disc; 2 tapered cylinders - round head (1 small, 1 larger); 1 cone; 1 barrel; 2 flames (1 small, 1 larger). Your inventory can be added to as you progress, but the above will give you a good start.

Once you get to the brown material, remove the heavy duty wheel and insert a barrel point in your hand piece. The barrel point is a versatile point - it clears larger areas in a hurry, but can be used

to perform other jobs also. At this point let me suggest you take just any piece of agate and experiment with the various points and wheels. This way you can familiarize yourself with each one and learn its capabilities. Never force your points - use an easy stroke let the point or wheel do the work.

This is where the fun begins. You have now reached the first real stage of wonderful things to *come*. You should be able to see the contour of the fire lines. Study the piece carefully and try to see what the stone contains. It will tell you what you are going to carve from it. There is something waiting to be born and you can give it life.

Take a fine-tipped felt point pen or an aluminum point or whatever you use to outline a cabochon and outline what you see. In other words, make a drawing on the stone of what you are going to carve. When you have outlined all of the main features, study it again. If there are any corrections to be made, now is the time to do it. Using your thin disc or separating disc, follow your "drawing" lines. You will be cutting into the stone, so keep that stone wet. As you cut these initial grooves you will find it easy to keep your cutting area wet as the water will follow the groove. It may be necessary to go back over. This cutting procedure again in order to get the grooves as deep as you want them. It is better to cut thin grooves to start with. Remember, you have a great deal of grinding and sanding to do to actually shape your carving, so *allow* for this. Once the initial outline had been cut, you can go on to the business of rounding or detailing your carving. If you recall, I suggested earlier you take a rough piece of agate, of any kind, and practice using each point to familiarize yourself with its capabilities. You now want to make your carving as three-dimensional as possible, giving it a life-like appearance. This will not happen overnight. You will have to work and rework areas until you have achieved the right look for your particular piece. Use caution at all times. You do not want to grind or sand too close to the fire or you will end up erasing the fire. Fire layers are so thin that they will just disappear before your eyes, so leave enough of the brown layer above the fire to allow for the six to seven polishing stages you will be using. Work your carving with your various points until you achieve a fairly smooth surface. Now you are ready for the polishing stage. I use diamond compound in a syringe dispenser, usually 2 grams each, *with* mesh equivalent of 325; 600; 1,200; 14,000 and 50,000. Diamond compound will go a long way if used properly. I mix a small amount of compound, about the size of a wooden match head, with one drop of crystalube and make a paste of this. I then take a round toothpick and apply this pasta over the surface of the carving.

Before going any further, let me explain the typo of point I use in my flex tool to achieve a brilliant polish. I turn my own wooden points, in various sizes.

They are turned to fit the collet of my hand piece. I go to the lumber yard and buy a 3 foot length of 1/4" doweling (the hardest wood available), then cut it into 2 inch lengths. One inch for the shaft and one inch for the point. The shaft is turned to 1/8 inch diameter, the point being + inch (or less) at the base and shaped to a rounded point or cone shaped point. I also use the rounded toothpicks for areas the larger points can't reach. Wooden points are marvelous tools for polishing. They absorb the diamond compound and do not heat the stone as other agents do.

Contamination is one thing that is to be avoided when using diamond compound. Just a minute grain of a coarser compound can cause scratches on the surfaces that are not readily visible until you reach the final polishing stage. It may well be necessary for you to go back and start from scratch, which is something you want to *avoid*. After each stage of polishing, your carving must be completely cleaned of all the compound just used. This is the same precaution you used when tumbling stones, and for the same reason. Start the polishing process with the 325 mesh and proceed with each of the next five mesh compounds following the above

instruction. Remember, a fresh point must be used with each grade of compound in order to avoid confusion on which point I had used for which compound, I marked the shaft with a #1 through #6 and stored my used points by sticking the shaft end into a large block of styrofoam, point up. This insures that they do not rub together or contaminate each other.

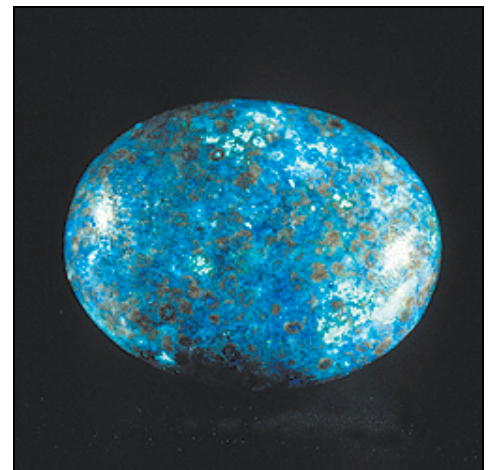
The polishing process must not be hurried. Take plenty of time with each compound in order to insure a good polish. There are times when I am not completely satisfied with the final polish, so to give it a higher luster I will go to a cerium oxide or tin oxide. I soak the wooden point for a few seconds before applying the oxide. Remember, your stone will heat rapidly with oxides, so keep the stone wet during this operation. If you overheat the stone it will "scorch" the surface and you really have a problem. There again caution and patience apply. After reading these two articles you may think "it's not worth it". I have purposely stressed caution and patience because I want you to achieve good results on your first effort. Believe me, it will all become "second nature" after a few experiments and will become an exciting and rewarding experience. It's like riding a bicycle, once you have learned, it becomes automatic. The joy of seeing a carving come to life far outweighs the time and effort put into a piece.

From Ore-Bits via The Palomar Gem - 5-2005

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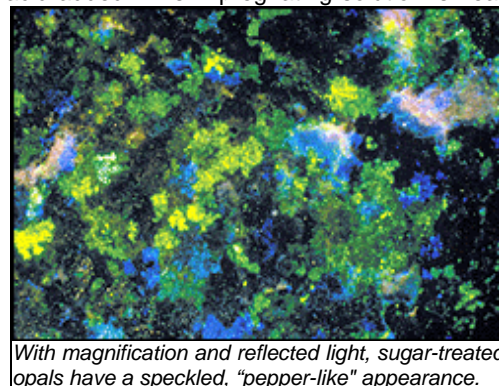
What Are the Sugar and Smoke Treatments of Opal and How Can I Identify Them?

There are a number of treatments that are used to darken opals and bring out their play-of-color. The two most commonly seen are sugar treatment and smoke treatment. These processes work only with porous opals, as they darken the stones by impregnation of carbon. Before starting either treatment, the opals are preformed into their finished shapes.



Sugar treatment of opals is used to darken their appearance and bring out the play-of-color.

The first step in sugar treatment is to wash and dry the opals. Treaters then place the opals in an acidified glucose-lactose solution - two to three times the opals' volume - with a few drops of sulfuric acid added. This impregnating solution is heated at 105°C for up to



With magnification and reflected light, sugar-treated opals have a speckled, "pepper-like" appearance.

10-12 hours, until it evaporates. The temperature is then raised to 125°C to solidify and then dehydrate the sugars impregnating the matrix opal.

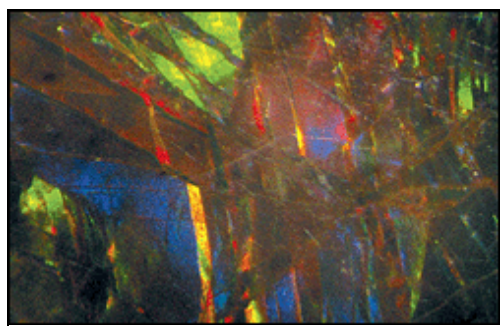
After this sugar-impregnated matrix opal is separated from the

sugary mass surrounding it, the opal is immersed in a glass vessel filled with concentrated sulfuric acid and heated to 100°C for 4–5 hours, reducing the impregnating sugars to black carbon, which darkens the opal's color and dramatically enhances its play-of-color. The carbon-impregnated opal is then allowed to cool before being washed in tap water for several hours to remove residual sulfuric acid.

Smoke treatment is not as common as sugar treatment. There are a number of variations. In one, the opals are wrapped in layers of newspaper, and then covered in aluminum foil, or soaked in used motor oil and wrapped in brown

paper. Heat is then applied until the paper turns to carbon, which penetrates the opal as with sugar treatment.

With experience, gemologists can identify both treatments using standard gemological equipment. Sugar-treated material has small dark areas that resemble pepper; smoke-treated stones have a darker, patchy-looking appearance. Both of these appearances can



In smoke-treated opals, the dark areas have an unnatural, patchy appearance.

be detected with magnification and reflected light.

Note, too, that both treatments typically affect only a shallow layer below the surface, so the new color may be removed through wear.

To learn more

about smoke and sugar treatment of opal, consult the [GIA Colored Stone Grading courses](#).

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Quartz Color Causes

By Doug Mitchell

This is a summary of a talk by Dr. George Rossman of Cal Tech on the causes of color in various forms of quartz.

As has been said before, the dark color of smoky quartz is caused by impurities of aluminum combined with gamma ray exposure, and the purple color of amethyst comes from impurities of iron in the ferric state, again combined with damage from gamma ray exposure. The gamma rays knock an extra electron off the iron, leaving it the quadruply charged state.

What was new to me was that the iron must not be substituting directly for silicon atoms in silicate tetrahedra for this to produce amethyst. The iron must be in channels that occur between the silicate tetrahedra in quartz. If the iron replaces silicon instead, the radiation effect produces an uncommon form of citrine.

In natural amethyst formation, the radiation is likely to come from potassium. While its radioactivity is too small to be of concern on human time scales, clays and K-feldspars can just keep plugging away over geologic time scales to eventually send enough gamma rays into nearby quartz to create the color.

The more common form of citrine is also colored by ferric iron in the channel sites.

The color of amethyst is not stable, and will fade noticeably with a few days exposure to sunlight, or any bright source of green, blue or ultraviolet light. I was a bit startled by this when I recalled seeing quite a few amethyst geodes out in the sun, probably for days, at satellite shows of the Tucson Show. Ordinary incandescent lights with their low color temperature would have the least effect this way, but higher temperature lights like krypton or halogen lights would be

worse. Heat will also fade the amethyst color. When the amethyst color fades, it is likely to be replaced by the citrine yellow color.

The loss of amethyst color can be reversed by exposure to "ionizing radiation", including x-rays and gamma rays (I neglected to ask whether short wave UV would qualify), provided there is no aluminum in the quartz. In the presence of aluminum, the quartz will instead become smoky on exposure to x-rays or gamma rays. When I asked how radiation turned it to amethyst in the first place. Dr. Rossman explained that the smoky color fades faster than the amethyst color over geological time periods. Thus, if irradiating your amethyst does turn it smoky, waiting a few million years may complete a restoration of that amethyst color.

When quartz with ferric iron crystallizes above 270 degrees Celsius, it generally forms citrine. When it crystallizes below 265 degrees, it can become amethyst. Ametrine, with its alternating sectors of amethyst and citrine, forms only between those temperatures. During the entire crystallization the temperature must hold near 268 degrees, which is why ametrine is known from only the one site (Anahi Mine, Bolivia), which now is reportedly exhausted (at least until they find a new vein). The ametrine was found in clayey pockets in a dolomitic limestone. At the correct temperature, the amethyst forms in r sectors and the citrine in z sectors, if my memory has not reversed them.

Dr. Rossman recently determined the cause of the pink color in ordinary rose quartz by dissolving it in hydrofluoric acid, which left a mass that was insoluble in boiling hydrofluoric acid. Examination with electron microscopes revealed this mass to be composed of fibers smaller than the wavelengths of visible light, which proved to be made of dumortierite plus 3 new minerals. These fibers also gave rise to asterism in this rose quartz, contradicting earlier explanations that involved rutile.

There is another rare form of rose quartz, where well-formed crystals show the rose color. In this case the color comes from aluminum and phosphorus impurities, again with gamma ray effects. Apparently this forms only in the presence of tourmaline. Perhaps the tourmaline absorbs something as it forms that would prevent the formation of rose quartz crystals.

Blue color in quartz is caused by ilmenite inclusions. The green of chrysoprase comes from willemseite (the nickel analog of talc) inclusions. A rare form of green crystalline quartz is colored by ferrous iron, I think, in the channel sites.

(From *Rockhound Ramblings via Flatirons Facets* 5-2003)

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Answers to Test Your Knowledge

1-K, 2-N, 3-U, 4-E, 5-V, 6-BB, 7-J, 8-F, 9-W, 10-M, 11-AA, 12-G, 13-Q, 14-S, 15-P, 16-A, 17-O, 18-Z, 19-Y, 20-H, 21-B, 22-L, 23-X, 24-T, 25-C, 26-R

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Members Only Website Password

To log onto the website's members only area at: http://opalsociety.org/aos_members_only_area.htm type: Name: "member" and Password: "spencer".

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June 2005 Gem & Mineral Shows

1-14 — **SHANIKO, OR:** 2nd annual show; *Rambling Rockhounds*; along Hwy. 97; daily 10-5; contact Darlene Denton, 5830 Haddon Ln., Anacortes, WA 98221-4332, (360) 588-0217.

3-5 — **LAS VEGAS, NV:** Show; The Bead Renaissance Shows; Palace Station Hotel/Casino, 2411 W. Sahara Ave.; Fri. 12-6, Sat. 10-6, Sun. 10-5; free admission; retail and wholesale, ancient, vintage, contemporary, and designer beads, buttons, jewelry, tools, books; contact J&J Promotions LLC, P.O. Box 420, Williamsburg, NM 87942, (505) 894-1293; e-mail: info@beadshow.com; Web site: www.beadshow.com.

3-5 — **PUYALLUP, WA:** 5th annual show; Puyallup Valley Gem & Mineral Club; Fruitland Grange Hall, 112th and 84th Ave. E; Fri. 12-7, Sat. 10-6, Sun. 11-5; free admission; dealers, showcases, demonstrations of faceting, cabbing, intarsia, and wire wrapping, kids' mine and wheel of fortune, club sales; contact Greg Nielsen, P.O. Box 134, Puyallup, WA 98371, (425) 745-4924, or Bob Balou; e-mail: stonebluebob@comcast.net.

4-5 — GLENDORA, CA: Show; Glendora Gems; Goddard Middle School, 859 E. Sierra Madre; Sat. 10-5, Sun. 10-4; contact Bonnie Bidwell, (626) 963-4638; e-mail: Ybidwell2@aol.com.

4-5 — LA HABRA, CA: Show, "Jubilee of Gems" North Orange County Gem & Mineral Society; La Habra Community Center, 101 W. La Habra Blvd.; Sat. 10-5, Sun. 10-5; free admission; dealers, demonstrators, exhibits, youth activities; contact Don Warthen, 15455 Tetley St., Hacienda Heights, CA 91745, (626) 330-8974; e-mail: Warthen@earthlink.net.

4-5 — RACINE, WI: Swap/Sell; Racine Geological Society; Bartlett Youth Center, 1120 N. Stuart Rd., four miles west of Racine; Sat. 10-5, Sun. 10-4; free admission; contact Lloyd Brown, 2446 N. 69th St., Wauwatosa, WI 53213; e-mail: browniewgs@aol.com; Web site: www.racinegeologysociety.homestead.com.

4-5 — SAN FRANCISCO, CA: Show; Crystal Fair; Laguna Ave. and Marina Blvd.; Sat. 10-6, Sun. 10-4; contact Jerry Tomlinson, (415) 383-7837; e-mail: sfxtl@earthlink.net, Web site: www.crystalfair.com.

10-12 — ROSEVILLE, CA: 66th annual CFMS convention and show, "Roseville Gem & Mineral Blast 2005" Roseville Rock Rollers Gem & Mineral Society; Roseville (Placer County) Fairgrounds, 800 All American Blvd.; Fri. 10-6, Sat. 10-6, Sun. 10-4; adults \$4 (3-day pass \$10), seniors (60+) \$3 (3-day pass \$8), children 15 and under free; more than 50 vendors, gold, minerals, crystals, beads, findings, fossils, meteorites, gemstones, opal, jewelry, rough and cut stones, supplies and equipment, gold nugget jewelry, gold panning, prospecting supplies, petrified wood, demonstrations, exhibit cases, educational lectures, children's activities, museum and special exhibits, fluorescent mineral tent, silent auctions; contact Rob, (916) 630-1000, or Gloria, (530) 367-2262; e-mail: g16marie@aol.com; Web site: www.rockrollers.com.

11-12 — BUTTE, MT: Annual show; Butte Mineral & Gem Club; Civic Center Annex 1340 Harrison Ave.; Sat. 10-6, Sun. 10-5; gems, minerals, fossils, jewelry; contact Joe Slouber, (406) 494-3034; e-mail: rockhound@in-tch.com.

11-12 — POWELL, WY: Show, "Stones and Bones" Shoshone Rock Club; Park County Fairgrounds, 655 5th St.; Sat. 9-8, Sun. 9-4; adults \$2, ages 12-18 \$1, 11 and under free with adult; dealers, demonstrations, lectures, field

trips, rock swap, grab bags, door prizes, silent auction; contact Jane R. Neale, 1207 Rd. 9, Powell, WY 82435, (307) 754-3285, or Mary Ann Northrup, 736 Lane 13, Powell, WY 82435, (307) 754-4472.

17-19 — CO SPRINGS, CO: Show; Friends of Mineralogy, the Denver Museum of Nature and Science, CO Springs Mineralogical Society; Phil Long Expo Center, 515 Auto Mall Loop; CO gems, minerals, fossils, exhibits from the Rocky Mountain West, presentations, trading, giveaways, Rocky Mountain Micromineral Symposium, field trips; contact Ruth Cook, (719) 632-9686; e-mail: csmsshow@cs.com; Web site: www.csms.us.

17-19 — NEWPORT, OR: 42nd annual show; OR Coast Agate Club; Newport Armory, 541 S.W. Coast Hwy. 101; Fri. 10-6, Sat. 10-6, Sun. 10-5; contact Ed Obermeyer, (541) 867-6903; e-mail: edndi@peak.org.

17-19 — REDMOND, OR: 22nd annual show; Jean Miller; Deschutes County Fairgrounds; Fri. 10-6, Sat. 10-6, Sun. 10-5; contact Jean Miller, P.O. Box 136, Molalla, OR 97038.

23-26 — PRINEVILLE, OR: 60th anniversary show and pow wow; Prineville Pow Wow Association; Crook County Fairgrounds; Thu. 9-6, Fri. 9-6, Sat. 9-6, Sun. 9-4; free admission; field trips, 70 dealers, displays, demonstrations, Sat. auction; contact Joyce Emerson, P.O. Box 671, Prineville, OR 97754, (541) 546-9473.

24-26 — SALT LAKE CITY, UT: Show; The Bead Renaissance Shows; UT State Fairpark, 155 North 1000 West; Fri. 10-6, Sat. 10-6, Sun. 10-5; free admission; retail and wholesale, ancient, vintage, contemporary, and designer beads, buttons, jewelry, tools, books; contact J&J Promotions LLC, P.O. Box 420, Williamsburg, NM 87942, (505) 894-1293; e-mail: info@beadshow.com; Web site: www.beadshow.com.

25-26 — CULVER CITY, CA: Show, "Fiesta of Gems" Culver City Rock & Mineral Club, Culver City Human Services Dept.; Culver City Veterans Memorial Complex, 4117 Overland Ave.; Sat. 10-6, Sun. 10-5; free admission; wire-working, gem-carving, faceting, and flint-knapping demonstrations, museum, mineral, fossil, petrified wood, and dinosaur bone exhibits, children's games; contact Janice Metz, (310) 314-1203.



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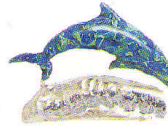
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