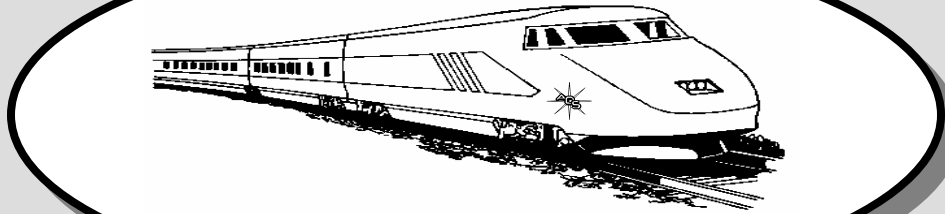


# The Opal Express

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## President's Message

*By Jim Lambert*

First of all I would like to thank Jack Liu, founder of Land C Corp, for his presentation at our April meeting. Jack spoke about his stone cutting service in China. In answering questions, he was able to dispel many misconceptions about abusive labor practices. Employees in his company are well trained, and provide a very professional product at reasonable prices. If you have any questions or have raw material that needs to be cut, you may contact Jack at his e-mail address landcco98@aol.com. His business address is in San Marino, Calif. and his phone number is (626) 578-0988.

We have arranged for some speakers from Australia to give a presentation at our next meeting in May. They will be flying in on the same day as our meeting; and will give a lecture about their Australian gemstones that may not necessarily be just opal. Hope to see everybody at the meeting.

## Members Only Website Password

To log onto the website's members only area at: [http://opalsociety.org/aos\\_members\\_only\\_area.htm](http://opalsociety.org/aos_members_only_area.htm) type: Name: "member" and Password: "hyalite".

## May Lecture – Alpha Gems & Jeweller of Australia

We are very luck this month to have two representatives of Alpha Gems & Jeweller of Adelaide, Australia, here in California to give us a lecture. Dr. John Potter and John Rance will give a presentation titled ***The Opal Industry - Moving with the Times.***

Alpha Gems & Jewellery is a business that is sourcing high quality gemstone and semi-precious stones from Africa, Australia and South East Asia.

The Johns are visiting the USA to connect with wholesalers and manufacturers who wish to connect to a steady supply of rough and/or cut and polished material.

The two Johns will have some South Australian Light Opal samples with them that will be available for purchase.

## Biographies:

### ***John Rance - Director & Gemologist***

Nephrite Jade was discovered in 1965 in South Australia and John Rance formed the first jade carving group at the South Australian Tertiary and Further Education Dept. In 1979, some of his work scored a gold medal at the Florida (US) Jade Show. This led to John being employed to assist in setting up the first opal and jade carving courses in South Australia. He is today recognized as the premier Jade carver in Australia. For several years he was the gemologist for the Australian Gemstone Corporation and for the past three years he has been gemologist for Alpha Gems & Jeweller Pty Ltd.

### ***Dr. John Potter - Director and Administrator***

John has fifty years of professional life behind him. Twenty of those years were spent in South Australia where John worked as an Agricultural Science with special expertise in soil conservation, geomorphology (soil and land mapping) and arid zone ecology. In 1977 John moved to Africa and since that time has been active in aid and development projects in Malawi, Zimbabwe, Kenya and South Africa. Since 1980 he has shared his time between Australia and Africa. His interest in gemstones is directed by his desire to assist African small scale miners be more effective in the market and to raise funds for the never ending problem of assisting Africa's orphans get the education they need to successfully enter the economy.

We welcome the two Johns to the USA and look forward to meeting them and hearing about what's going on in Opal industry.

## Opal Society Workshop

The American Opal Society's workshop is open at Ball Jr. High School every Thursday from 7:00 to 9:30 p.m.

**Effective May 15<sup>th</sup>, the workshop will now meet in Thursdays instead of Mondays; the exception on the week when the general meeting is held.**

The school is located at 1500 W. Ball Road in Anaheim. If you are traveling east on Ball Rd. the parking lot entrance you need to use is just before the railroad tracks Room 37 is in the center of the campus.

Please bring a roll of PAPER TOWELS with you for clean-up as the room is a science lab and needs to be kept spotless.

To attend, membership in the American Opal Society is a must due to insurance. A nightly fee of \$2 is asked to help keep the equipment in good running condition.

## Last Month's Speaker – Jack Liu

Last month's speaker, Mr. Jack Liu, talked about on his stone cutting service in China.

Jack Liu was born and raised in Beijing, China. Mr. Liu obtained a bachelor degree in geology from the University of Petroleum, China. He worked as a geologist for oil production, where some occurs in the eastern part of China. He immigrated to American in 1991 and obtained a Masters Degree in geology from the University of Wyoming in Laramie, Wyoming. Jack moved to the Los Angeles area. He is married to a gemologist and has two children.

Jack founded the Land C Corp in 1998. He has a partner factory in Mainland China which conducts cutting stone services such as faceting and cabbing. Jack and his company now focus on the cutting stone service for American gemstone miners, gemstone



*Mr. Jack Liu with map of China*

dealers, professional jewelers, gemstone collectors, and hobbyists.

Jack travels to China twice a year. He takes a 14 hour flight to Hong Kong, then travels 2 hours north by train to his partner factory.

The factory has been operating for about 30 years. 80 to 100 people cut there. Many of the people have worked there for 10-15 years. The cutters work eight hours a day and go home at lunch for a traditional nap.

They have an emphasis on quality cutting as opposed to quantity. The company produces about 5000 carats a day and 100,000 carats a month. They will do fancy cuts, concave cuts, and calibrated cuts. They can also do very large cuts in the hundreds or thousands of carats. They have also cut rare and unusual stones.

Jack showed us a map on China, emphasizing that it had about the same area as the USA, but with 5 times the number of people. Jack mentioned that most of the people live near the coastal area of the east. Jack also mentioned the various major cities and compared them to the cities of the USA - News York was Shanghai, Beijing as Washington DC as a center of government, Guangzhou to the south was comparable to Los Angeles, where lots of trade took place. There are many languages in China; Jack, for example, grew up in Beijing, can not understand a word from the people of the south, kind of like Germans talking to the French. Western areas are typically unpopulated and poor.

The gem business is not that big in China yet. China has been mainly concerned with jade and has somewhat ignored other gemstones. However, some gem production occurs. There is turquoise production – some is good, but some needs to be stabilized. Also, some pegmatite minerals are mined; tourmaline not that good of quality because of its inclusions. Also, there is good peridot being recovered, but of small size. There is a small amount of diamond production with very little gem quality diamonds produced.

Jack speculates that there many undiscovered gem deposits in China; the boarder area near Myanmar (Burma), is a good example.

If you look at a map where gem deposits are, they just seem to stop at the Chinese boarder. He believes they probably continue into China, but are undiscovered due to the lack of emphasis and ignorance of gems by the Chinese. He believes as China's economic expansion continues and more western experts enter China, that this will change.

If you need any details about cutting stones, please feel free to contact Mr. Liu. Here is his contact information:

Mr. Jack Liu, Land C Corp.

2275 Huntington Drive, #315, San Marino, CA 91108

Tel: 626-578-0988, Fax: 626-578-1098

Email: [landcco98@aol.com](mailto:landcco98@aol.com)

## ++++ Cabochons: Hints, Tips and Strategy

Last month I gave some hints, tips and strategy on slabs and cabs; this time I want to add to the list and elaborate on a couple of the previous points, all related to cabs.

When grinding, sanding or polishing your dopped stone, work on the part that is below the center of the cab. You will hold the dop stick horizontal or pointing up and away from you. Why? On soft backed surfaces (expanding drum sanding wheels or padded polish wheels) the upper edge of your stone can catch and gouge the wheel causing the stone to be pulled out of your grip or torn off the dop stick. Damage to the stone or the wheel is the usual outcome; injury to you or a bystander may also occur. Rigid wheels don't grab like soft backed wheels but developing good work habits is easier than having to switch habits from one step to the next.

When attaching the dop stick, preheat the stick and the stone. This allows the wax or hot glue more time to flow and penetrate the surfaces before hardening and results in a strong bond. When the adhesive cools enough so its surface is no longer sticky, press the wax or glue to broaden the area covered on the stone and change the blob shape to a slope or a radius that blends the joint between stone and stick. This further strengthens the joint. Allow the assembly to completely cool before beginning to grind.

When sanding, if you have difficulty recognizing when the wheel has removed all the previous scratches, try sanding in only one direction on each wheel so all the scratches are parallel. On the next wheel, work so the new scratches are 60 to 90 degrees from the previous scratches. When only scratches oriented in the new direction show, all the previous wheel's scratches are gone. Sand a little more to get through the remaining bruising then go to the next wheel using the same rotating technique.

To see the scratches, or confirm their absence, dry the stone completely and use a magnifier in good light. A loupe works but an Optivisor or equivalent works better.

To improve your finished polish, improve your final sanding step. After sanding on the finest grit, go back and sand again using only the (usually) more worn center portion of the belt. Use light pressure and more water flow.

This reduces the cutting action and can often work as well as a finer grit sanding. Even if it produces no visible change some residual bruised material may be removed and the polish will be better.

Avoid excess polishing compound. If the polish pad is discolored with polish compound you almost certainly have enough.

Keep the polishing pad moist. A spray bottle works well for this. Polishing is simultaneously a chemical reaction and a smearing or spreading action, not an abrasive removal of stone (exception: diamond dust). The reaction occurs when friction causes the polishing compound, water and stone surface to heat up. If you think of polishing compound as hard wax, and water as a solvent that needs heat to melt the wax, you will be closer to the truth than if you think about abrasive action.

When polishing, use firm pressure briefly. Avoid prolonged contact of stone to polish pad. You need to avoid heating the body of the stone; heat only the surface. Press in for five seconds or less and get away; move to the next area and repeat; continue until the

whole surface is polished. If polishing a cab takes over five minutes something has gone wrong. Some likely causes are: something in earlier preparation has been inadequate, the polish compound is applied too liberally, the compound is contaminated or defective, or the stone cannot take a high polish. Avoid wasting time; identify the problem, correct the problem, then polish.

Bruce Mensinger, Shop chairman  
From *The Nugget* - 2/07

## Appraising: Stories from the Trenches

By *Ralph S. Joseph*

OCTOBER 14, 1994 - -- There is so much appraisal "theory" floating around, sometimes we lose sight of the fact that it really does apply to daily business activity. The following are examples of ideas or principles discussed in previous articles, applied to every day business. The events are real, but the facts have been altered.

### "But we don't want the refund!"

A couple celebrating their 45th wedding anniversary had just purchased an engagement ring containing the 1-carat diamond that "we could never afford until now," from a local (large chain) jewelry store. The center diamond (weighing 1.15 carats) was represented as G color and VS1 clarity. Although the store that sold the ring offered to provide insurance documentation, the customers chose to have the ring independently appraised. The selling jeweler has a 30 day return policy, with refunds offered on a no-questions-asked basis. Immediately following the purchase, the ring was brought to me for appraisal. I started by grading the center diamond, with the limitations of grading a mounted diamond carefully explained to my clients, Mr. and Mrs. Solitaire.

I assessed the diamond's clarity grade at I1, and I agreed with the stated G color grade. Naturally my clients were shocked that a reputable jeweler would misrepresent a diamond by several grades. I offered the possibility that this was a clerical or inventory error but agreed that the disparity was disturbing in any event.

My estimate of retail replacement value for the ring (based upon G/I1) was within 10% of the actual selling price. Although my estimated retail replacement value was lower than the purchase price, I assured them that unless the selling price was "unconscionable," it was not my concern in this appraisal assignment. There is a range of typical selling prices, and I don't get involved as the judge and jury regarding another merchant's profit margins.

"Well, I guess we'll just go back and get our refund," Mrs. Solitaire said to her husband. I suggested that they return to the store and ask for a 1.15-carat, G/VS1 diamond--the diamond that had been promised them, and represented in writing at the time of purchase.

Mrs. Solitaire asked, "Will they do that?" I said I didn't know, but that if she had purchased a Cadillac and found out on the way home that it had a Volkswagen engine, they would return to exchange the vehicle for a genuine Cadillac, as represented. This seems no different, given the extreme discrepancy in the clarity grade.

Mr. and Mrs. Solitaire agreed, and with my warning that the first response might be, "Well, of course you understand that a VS1 will be more expensive," they were on their way.

The next day, Mrs. Solitaire called and told me she had spoken to the salesperson who sold her the ring. "She told me that she would be glad to order a VS diamond, but it will cost more. I demanded to speak to the manager, but she said the manager would be away for several weeks. What should I do?"

I reminded Mrs. Solitaire that I am not a lawyer and could not dispense legal advice, but I suggested that she be more insistent about the VS1 replacement, then perhaps just accept the refund if she was finding the going unpleasant and didn't want to get an attorney involved.

One week later Mrs. Solitaire called again--the store was ordering a diamond of similar weight, G/VS1, at no extra cost to her, and would give her 30 days again to independently verify the color

and clarity. When the diamond came in, the Solitaires brought it directly to me to grade and appraise. Again reminding them of the limitations posed by the mounting, I graded the diamond--G/VS1--unless the prongs were hiding something.

Satisfied at last, they asked me to proceed with the insurance appraisal. This was one case in which the appraised value was significantly higher than the purchase price!

### "But the jeweler I bought this from is my husband's friend"

A diamond engagement ring was submitted by Mrs. Bargain for an insurance appraisal. The center diamond was a marquise weighing approximately 1.25 carats.

Close examination revealed a cluster of small inclusions near one end, including one feather emanating directly from the tip. Because the end prong was small and off-center, the inclusions were easily visible, some without magnification. I graded the diamond M/N color, I1 clarity. I specified in my notes that the appraisal would give the "benefit of the doubt" to the client, with stated value based upon M color. This would be stated clearly in the finished appraisal.

My appraisal would also include a note about the asymmetrical nature of the diamond's outline (one side bulged noticeably at the girdle), along with a plot diagram.

At the end of my examination of the ring, Mrs. Bargain said she had never been satisfied with the way the diamond was set in the ring. She asked about how to improve the ring's looks. I suggested a heavier head for the diamond, with chevron prongs to protect the tips. After looking at other diamonds set this way, she agreed to have hers reset, and she left the ring with us.

Recently Mrs. Bargain returned to our store, complaining, "What you said in the appraisal is very far from what my husband's friend said when he sold me the diamond." She added, "When I told him that I left the ring with you to reset the diamond, he was shocked! He said, 'Well that explains it. They switched the diamond.'"

"And what do you think?" I said.

"Well, I just don't know," she replied.

At this point I knew that definitive action was needed. I asked Mrs. Bargain if she had ever left the room when I first examined (and carefully documented) the diamond. She replied that she had not. I asked if I had ever left the room with the ring, except for about 30 seconds to steam clean it. She replied that I had not. I asked if I had plotted the diamond in her presence. She replied that I had. I asked if I had demonstrated with comparison to master diamonds that the diamond was on the yellow side, and that it was not symmetrical. She again replied that I had.

She then acknowledged, "Of course this firm would never switch a diamond, but now I have to deal with my husband's friend. He'll be here for a visit next week, and I don't know what to say." I refused to get involved in that discussion! In response to one of my "Don't Forget the Details" articles, in which I noted the importance of plotting diamonds in appraisals (or describing prominent, grade-setting inclusions), I received a pointed message on the Polygon Network. Something like, "Come on, Ralph--plot diamonds?" followed by a friendly tirade about what was reasonable for us to do in documenting jewelry for insurance and about what is not reasonable to expect. If I ever had a doubt about whether it is worth bothering with plots and/or verbal descriptions of diamond clarity characteristics, this scenario dispelled it. The care I exercised in documenting the diamond saved a customer and a possible dent in our fine reputation.

### "One rotten Apple"

Several months ago I received a call from an insurance company asking me to handle a claim involving a broken opal. When I met with the policy holders, Mr. and Mrs. Ridge, I was presented with a 4.25-carat, irregularly shaped opal that had split across the middle into two pieces.

I was being asked to replace a fine quality, odd-shaped opal, measuring approximately 17 mm in length and very shallow and flat, with one "to match." The opal would have to be a very specific shape and thickness in order to fit into the center of the existing diamond

pendant. The total insurance coverage on the entire opal and diamond pendant is \$3,900.

Anyone who has ever tried to match a fine opal knows how difficult that can be. The nature of opal is such that no two are exactly alike, and except for pairs that are matched at the original production stage, matching is extremely difficult. Generally we have to be concerned with quality and effect, rather than actually trying to match every element of the stone. That is the approach that I suggested, and my clients agreed.

I sent the broken opal to a trusted opal dealer who said he would have a new stone specially cut during his forthcoming trip to Australia. One month later, I received the stone. It was a fair match, but Mrs. Ridge did not like the opal, and fortunately the dealer had agreed in advance to accept a return if it was not to the customer's liking. He did not want to pursue the project further.

I moved on to another supplier, with the understanding that larger opals would be sent for approval, and once approved, the right one would be cut to the proper shape and proportions. This is where the appraisal problem comes in. I am not criticizing the original appraisal, which was generated by the jeweler who sold the pendant to Mr. and Mrs. Ridge, and the value stated was the same as the selling price. But this replacement problem illustrates an omission from the report.

When unusual items are presented for appraisal, we have to think even more carefully about how that item, or in this case, a component of the item, would be replaced. We found a 10.75-carat oval that can be cut to the correct size and shape of the pendant.

The opal is going to cost \$350 per carat, including re cutting. That amounts to a wholesale cost of nearly \$3,800, just for the opal. This means that Mr. and Mrs. Ridge are underinsured. They will not be pleased about spending several hundred dollars or more out of pocket in order to replace the opal. Could the person who originally appraised the pendant have anticipated this problem? Could have, yes. Should have? I'm not sure, but perhaps so.

When we appraise, for example, an engagement ring with a 1-carat, modern brilliant center diamond and baguettes on the sides, we don't have this problem. There will usually be adequate insurance coverage to replace any one component that may be lost or damaged. And we know that our client will not have to "custom cut" any diamond from that ring in order to replace it. So the opal is different.

How will I handle the reappraisal of this opal and diamond pendant when the replacement job is complete? Let's assume that opals of the quality, size and type of the recent replacement are available on the retail market at \$700 per carat. Multiplied by the 4.25-carat finished weight, that amounts to \$2,975 retail. Yet my cost to duplicate (as closely as possible) that opal, we now know to be \$3,800 at the wholesale level. There is a deficit of \$825 before any markup.

I will make a point of clearly explaining in the appraisal the replacement scenario just experienced. Replacement of the entire pendant with a "comparable" item (in the event it is entirely lost or destroyed) is one angle. Duplication of the pendant "identically" or nearly so is another approach. And of course I should address the issue of replacing just the opal, to cover a repeat of the process we're dealing with now.

In this appraisal assignment I have the advantage of having experienced the actual replacement of one component of the piece. But I have also experienced a procedure which is critical to understand in some appraisal situations. When any component of an item is an issue in and of itself, it may not suffice to look at the piece simply as a whole. A separate statement about a particular element will be helpful at the least, and sometimes absolutely necessary.

"Is there any item here which you would want to replace identically?" is a standard question in my pre-appraisal interview. A discussion about unusual components seems to be critical as well.

From <http://www.nationaljeweler.com>.

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## American Gemstones

DEPARTMENT OF THE INTERIOR  
UNITED STATES GEOLOGICAL SURVEY  
DIVISION OF MINERAL RESOURCES  
128 Fifth Avenue, New York, NY  
January 1, 1898

Dear Sir:

The gems, precious stones and ornamental stones named in the following list have been found at various times in the United States. If you know of the finding of any of these within the last year, will you, if possible, kindly fill in the amount and estimated value opposite the name of the species or variety, with a description of the locality and occurrence, and return the list in the enclosed envelope, which requires no postage. If you know of any other precious or ornamental stones found, in addition to those on the list, kindly include a description of them also. PLEASE FORWARD YOUR RESPONSE AS SOON AS YOU CONVENIENTLY CAN.

Very truly yours,

George F. Kunz

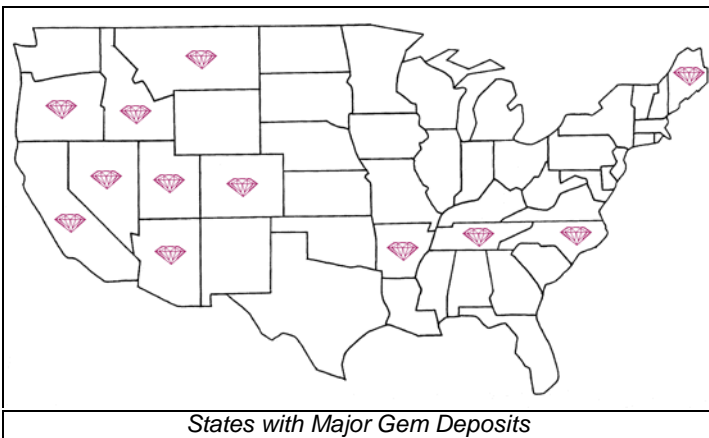
Special Agent  
Division of Mineral Resources  
US Geological Survey

*From Lawrence Conklin's Letters to George F. Kunz*

The letter above is only one of a beautifully compiled collection of correspondence from a book titled Letters to George F. Kunz by Lawrence Conklin. Like the music of the great composers, poignant notes and comments can posthumously capture one's complete attention and transport the imagination to another place and time. Whether receiving or sending these letters, such respect and kinship was conveyed that one is impressed and humbled by the unpretentious knowledge freely shared by Dr. Kunz and his peers. Accompanying this letter was a list of 118 gems occurring in the USA! It is interesting to note that at that time (1898), red beryl, benitoite, morganite and kunzite among others, had yet to be disclosed. Historically, all 50 states have produced some gem materials but commercial production is limited to only a few areas. By far the largest number of finds, both currently and historically, have been made by amateur collectors, mineralogists and geologists. Here is a brief overview of current (1996) important American deposits in alphabetical order.

**ARIZONA** for many years has produced a large variety of gemstones including amethyst, azurite, chrysocolla, fire agate, garnet, malachite, obsidian, peridot, petrified wood, and of course turquoise. The Arizona peridot source is located on the San Carlos Indian Reservation and is considered the largest production in the entire world and turquoise from the Sleeping Beauty Mine is considered some of the finest.

**ARKANSAS** is famous for being the only location in the United States that has ever produced diamonds from a pipe (there are many rumors that new pipes are about to be worked commercially in Wyoming and other areas of the Midwest and West, however, these projects are not yet being implemented). Arkansas also produces wonderful quartz crystals popularly known as Herkimer diamonds because of their crystal habit and clarity. One little known fact is that fresh water pearls are also cultivated here in large numbers.



States with Major Gem Deposits

**CALIFORNIA** has a long history of gem production starting with tourmaline. This Pacific coast state has produced tourmaline, benitoite (exclusively), spessartine garnet, abalone pearls, morganite, and some natural blue topaz, California also boasts the distinction of being where the original find of gem kunzite was discovered in 1901. The Himalaya mine has produced Pink and flawless bicolor tourmaline from the late 1800s to the present. In 1972, approximately 30 of the now highly prized and extremely rare "blue caps" from the Queen mine were unearthed. Like the one at right, only 15 found their way into some of the country's most respected private and museum collections, such as the Smithsonian, American Museum of Natural History and the Houston Museum of Natural History to name a few. As of this printing [1996], future exploration is being discussed to see if benitoite can be mined and distributed on a larger scale. We will keep you informed.

**COLORADO** is known among mineral collectors as an important locality. It has produced smoky quartz, topaz, amazonite, and aquamarines from Mt. Antero. More recently, the famous Alma mine was reopened and produced the finest rhodochrosite in the history of the United States including some which were faceted into gems over 40 carats. This material is too soft for most jewelry wearing but stones of this size are spectacular collector items.

**IDAHO'S** state stone is the star garnet. It is produced in large quantities and sold all over the world. A small find several years ago produced exceptional aquamarine from the Saw Tooth Mountain District. Limited opal mining is producing some fine material.

**MAINE** was long famous as the original discovery for United States tourmaline and is still producing sporadically. In 1972, over one ton of tourmaline was produced at the Denton Mine. However, despite continued mining, little else was recovered. More recently, Mt. Mica has been re-mined and produced some high quality blue-green tourmaline in small sizes. In addition to tourmaline, Maine has produced aquamarine, heliodor, morganite and recently, excellent amethyst.

**MONTANA** is world famous for it's sapphires from several localities. The most well known are the beautiful blues from the Yogo Gulch. Other varied colors are known from the Rock Creek area and other alluvial deposits. The potential production of large quantities of small size sapphire from Montana is most promising.

**NEVADA** has been a major producer of turquoise for decades and is a strong competitor with Arizona for the finest. Another important deposit is the Virgin Valley area for fine opal. If the opal could be stabilized, it would be among the world's finest, however, most of this material has a large water content and often crazes.

**NORTH CAROLINA** is historically known for producing diamond, ruby, sapphire and emerald, as well as being the unique locality for hiddenite which is a rare emerald-green chromium-colored spodumene. Over the last several decades there have been sporadic discoveries of ruby and emerald, including one fine emerald weighing approximately four carats which is on display at Tiffany & Company in New York. More recently new finds of hiddenite have been found.

**OREGON** is one of the largest producers of agates of all sorts, including the famous Thunder Eggs. More exciting for jewelers has been the gem feldspar (sunstone) which has been found in numerous colors over the last several decades, including red and green. A recent find of opal has been interesting; however, it is also subject to crazing. Several large stones have been cut from the material, and to date they have remained stable.

**TENNESSEE** exports the largest quantity of freshwater mussels from North America for use as nuclei for cultured pearls around the world. American Pearl Company is the originator and largest producer of cultured freshwater fancy-shaped pearls. It must be mentioned that 50% of that cultured pearl production is exported to Asian and European wholesalers, who in turn sell them to their customers. The other 50% stays right here in the US, where designers and manufacturers incorporate the beauty of these fancy-shaped pearls (as well as others) into jewelry. Although collectors are the main purchasers of natural pearls (which command a much higher price than cultured), their numbers are much smaller in comparison to cultured pearl buyers. This is because mainly due to a lesser informed public in regards to natural pearls, as well as the strong market saturation and lower price of cultured pearls.

**UTAH** has long produced topaz crystals which are beautiful in color despite fading upon exposure to sunlight. More recently, a very important find of a unique gemstone, red beryl, has been found in the Wah Wah Mountains.

The original discovery in the Thomas Mountains (near the topaz) was unimportant, however this new find is producing much larger gem quality crystals. A few cut stones are known for being over four carats, and are a very clean fine quality red. Exploration is going on currently, making this the largest potential commercial gemstone deposit in North America. Today more than ever large global exploration



The "Candelabra," a rubellite tourmaline, was mined by Pala International at the Tourmaline Queen, San Diego County, California, in 1972. (Photo: Harold & Erica Van Pelt)

companies, which once specialized primarily in precious metal and ores, are recognizing North America's gem production as yet another valuable resource to be tapped... but then; isn't that what Dr. Kunz always said? Many thanks to Lawrence Conklin, New York, for his meticulous and painstaking research. What a great book!

From *The Gem Spectrum*, Pala International's Newsletter, 1996, Vol. 2, No. 1, [http://www.palagems.com/gem\\_spectrum2.1.htm](http://www.palagems.com/gem_spectrum2.1.htm).

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**Gems and Technology - Vision Underground**  
**Are instruments that can see through rock to potential gem deposits the future of mining?**

By Martin Stone (2002)

The techniques for finding and recovering gemstones have changed little since the first human was dazzled by a precious colored stone.

Today, almost all of the world's gemstone mining is done on a low-tech, artisanal level - miners digging by hand or with light equipment, seeking pay dirt.

In most places, exploration is a hit-and-miss process, with deposits typically being small and widely dispersed. Miners dig, and either they get lucky or they don't.

Slowly, however, some high-tech applications are making inroads into this ancient industry. They're brought in mainly by the larger companies who evaluate deposits to determine if they are worth mining, while mapping the most likely places to dig. The corporate experts often come from backgrounds in metal or diamond mining, where this type of exploration is standard and adequately funded by investors.

The most widely-used gemstone exploration techniques today are ground-penetrating radar, known as GPR; trace-element analysis, which involves seeking signature elements as clues to where gems may lie; and use of a device called a "terra thumper," which identifies differences in the structure of the host rock through seismic analysis.

GPR has proven useful in providing subsurface mapping of potential gem-bearing pockets, or "vugs," but the readings can be confused by moisture in the ground, and they can't separate gem-bearing pockets from the non-gem-bearing ones.

Experts disagree on whether using devices like GPR can ever be cost-effective in exploration for gemstones, which normally occur in small lodes and do not fetch as much as diamonds or gold in the marketplace.

Experimenters in mapping gem deposits with GPR have already been tried, with variable success. For example, in 1994 GPR was used in the Old Himalaya tourmaline mine in California. At first, ground moisture produced indistinct imagery, but further experimentation yielded enough information that searchers were able to discern subterranean pockets. However, the question of whether recognizable vugs contained gems still had to be answered by digging.

According to Bill Larson of Pala International, owner of the Himalaya Mine, "The imagery was good, but you couldn't tell if it was a pocket or a crack. So you mine and find a clay seam, you couldn't discern an actual gem pocket at that time. But they did find pockets. They were running at that time around 30 percent, and they may have jacked it up to 40 percent, but we were shooting six false anomalies for every four that we got. We never found a big one."

Despite results like these, some believe that GPR is the wave of the future for gemstone exploration. Geophysicist Jan Francke of Associated Mining Consultants Ltd. is regarded as a leading expert on the use of GPR in gemstone applications. "I wouldn't hesitate to say it is the most ideal and best-suited technology to image the high resolution needed to see very small features within pegmatite," he told Colored Stone.

The main drawback with GPR, he said, is the penetration depth. "The higher resolution we need, the less penetration we get. The general rule is that anything beyond three meters [9.8 feet] is unrealistic. But the resolution within that three meters is down to the centimeter scale. So we are seeing very, very small items 300 centimeters into a rock base or a dyke."

Francke said the images produced by GPR are virtually three dimensional, allowing prospectors to examine the size and shape of vugs. "Historically, we'd just go back and forth with a GPR system to develop a three-dimensional picture. But within the past six months or so, we've developed a multiple-channel GPR, so you complete one sweep with the system and it takes multiple cuts and immediately displays it in the third dimension. So not only do we see where the anomaly is, for example a vug, but we see the depth and its shape all in one pass."

The devices themselves are small and portable and can be passed over target areas in a wheeled cart, dragged by a bicycle, or carried by hand. The machine consists of a laptop computer, a control box that fits in a backpack, and a 12-volt battery. Francke says smaller units sell for as little as \$20,000, making them economically viable for working small claims.

GPR only works on ground level and is not applicable to airborne exploration. Making GPR airborne-friendly involves some

complicated physics which presently lead to diminishing returns, Francke said. He added that GPR works well in most alluvial environments, but in sites containing conductive clays the technique is not appropriate as the conductivity renders confused imagery.

"If GPR is not appropriate, the next option is refraction seismic methodology," says Francke. "It's simply going to give us the base of the channel, in other words, show us where the bedrock is. It may show you where pockets of gravel are. but it's a much lower-resolution technique than GPR."

The use of GPR is not meant to replace trenching or drilling, but merely to find the most likely places to dig. About 99 percent of GPR usage worldwide is for civil engineering applications such as the locating of buried pipes and other structures. Whether GPR manufacturers will work toward improving mining applications will depend on the extent to which miners embrace the technology.

Another popular technique for prospecting is trace element analysis of areas suspected of containing gemstones. An extensive study has been made of an alluvial sapphire deposit in Montana by researchers from the University of Toronto.

The scientists were able to catalog several trace elements that naturally occur in sapphire-rich areas. This data can now be used as clues in other areas where sapphires or other colored stones are believed to exist.

A major application of the trace element analysis technique took place at the Seahawk emerald mine in the Piteiras region of Brazil. Seahawk President Louis A. Lepry explained that his company had been focused on gold exploration in Latin America and in 1998, with -old prices down, the publicly-traded company broadened its mandate to include colored stones.

"We approached that property like we would a gold property and conducted systematic grid sampling of soil," he said. "There was no real outcrop on this particular property, just weathered soil, extending anywhere from two to 50 meters [6.6 to 164 feet] in thickness. We did a multi-element soil geochemistry survey on a grid across what we knew to be the highest potential, and that came from the fact that we had regional geophysical surveys in hand. We gridded about a two-square-kilometer [0.8-square-mile] area and conducted those surveys, and then followed on with an auger sampling program. That body of information was then condensed into defining drillable targets. All the emeralds in the region had come from a very distinct horizon, two to five meters [6.6 to 16.4 feet] thick."

Seahawk drilled a total of 45 holes with an average depth of about 180 meters [590.4 feet] and found emerald crystals in some of the cores. The exploration team conducted multi-element geochemistry testing of several thousand samples, looking for 30 different elements. Lepry said the operation mined roughly 800 tons in 2001 and is now geared to produce 50 to 106 tons a day.

Not all experts agree that higher technology has an important role to play in the world of colored stones, however. Mining consultant Gordon Austin conceded that high technology applicable to diamond exploration. Where the indicators are well known, and the economic returns justify expenditure, but he frowns at suggestions of local subsistence miners and prospectors being replaced by Space Age scanners.

"You can use ground thumpers - seismic survey - to map bedrock alluvial contours, which can be used in exploration of alluvial deposits," he said. He noted, however, that most gemstone deposits are discovered by artisanal miners based on local folklore and surface exposures and recovered simply by mining a likely spot.

"Because of the very nature of gemstone deposits," he contends, "they're extremely difficult to do exploration for." He points to several instances where large sums of money spent on exploration could have been better invested in the actual mining. Aside from that, large sums of money generally mean larger companies, and not many large concerns are involved in gemstone mining at the present time.

Another issue is the social and economic impact of automating exploration. Local miners have supported themselves for

generations by low-tech mining, and some governments are taking a hard stand against proposals by foreign companies to bring improved exploration and recovery methods to historical gemstone mines.

Sri Lanka has banned the use of most high-tech methods, says Austin, "Because they don't want mass mining to come in and tear the country up, and possibly deplete a resource that has supported maybe 25 percent of the country's population for several hundred years. Operating as it is right now, [mining will] continue to support a large part of the population for another couple hundred years."

Despite the drawbacks and uncertainties of high-tech gemstone exploration, some progress is inevitable. What lies in the future? According to Francke, some technology that has been developed for military and law enforcement usage may well be applicable to mining and exploration in the future. One promising technology involves extremely high X-ray frequencies, a technique presently being used by customs inspectors to see through the walls of shipping containers. This and other devices may become the ultimate companions of or heirs to - the pan, the pick, and the shovel.

From *Tips from the Jeweler's Bench*, <http://www.Ganoksin.com>.

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## Miscellaneous Opal Preparation - or How to Make Opal Doublets

By Don King ([13cb11@comcast.net](mailto:13cb11@comcast.net))

Although there are exceptions Australian Andamooka matrix opal, Louisiana Opal-in quartz and Honduran opal are best made into doublets or triplets. The Andamooka matrix opal while not difficult to sand and polish presents a better stone when capped with optical quartz or glass. The Louisiana Opal in quartz is almost impossible to get a good show piece since the quartz pops out during grinding and sanding phases. (it's hard to polish a hole). The Honduran opal is in a matrix that generally has white/grey/brown potch scattered through-out the stone.

I generally prefer to slice the rough if it isn't already in that condition. Since we are going to cap it the thickness can be 1/8 inch to 1/4 inch. All three are of sufficient strength to not require a backing (basalt or other stone). Again a personal preference - I preform the cab with a flat top as it came from the saw.

The top is rough ground - FLAT - and sanded to 600 grit. Best done on a flat disk, not a wheel! The sides are finish sanded and polished to size.

With the Honduran opal if "rough" chip it to discover opal orientation. Saw to expose opal fire - generally pin point fire. With the Honduran opal now paint out the "potch with Marks-a-lot permanent marker - black. Be careful to not paint out fire.

With preformed cabs on hand, cut & perform optical quartz or glass to same size as the cab. Rough grind the bottom face of the "cap" to 400 grit; the sides can be shaped to match the cab later.

All can be treated as follows but the only one really needing this step is the Honduran opal:

Put 330 epoxy - resin only- in a small pan (cat food aluminum can etc.) just to cover the cab. Keep warm over night on a dop pot, toaster oven etc at low heat. This will allow the resin to penetrate the stone and seal any cracks etc.

The next morning wipe off excess epoxy resin and proceed as follows for all types of opal caps. Mix epoxy per directions of manufacturer preferably with a glass rod stir slowly so as to minimize entrance of air bubbles into mix. 330 water clear epoxy to be preferred. Pop bubbles with tooth pick or pin - breathing upon epoxy will cause CO2 from exhaled breath to also pop bubbles.

Put stone(s) on waxed paper or other throw-away material. Apply epoxy to opal preform. Align the cap, roughed side down, over opal and press down slightly to force epoxy into opal and to remove any air pockets. The epoxy sets up faster and better if kept warm for several hours before touching or moving the stone. This can be done on dop pot etc. Any excess epoxy will drip onto the waxed paper and be thrown away or ground off during the capping work ahead. When the epoxy has hardened - overnight etc. - you

can proceed to do final shaping, doming, or what ever form you wish to achieve.

If perchance you have left air pockets in epoxy set or didn't get epoxy into scratches in glass or stone, you can easily remove the cap and clean all to start over - fingernail polish remover will soften the epoxy - wipe off all excess and start over. Soak the doublet in polish remover to perform this task. Clean with acetone if in doubt.

There are several means of getting a warming pot to do the above:

A. Coffee pot warmer pad also makes a good dop pot \$7.00 new \$1-2 at Goodwill etc

B. Dop pot

C. Toaster oven

D. Make one - Get a 3 lb coffee can. Notch the side for cord exit or chisel out wood for cord exit. With scrap lumber make a wooden base - larger than entire can. Get a porcelain light socket and screw it to the wood base. Add an electrical cord; e.g. get an old computer power cord etc with male end only. Use a 40-60 watt light bulb. Punch a few holes in can to let some heat out. Invert coffee can over light assembly. The rim of can (bottom) will contain small aluminum can for epoxy.

From *the Mobile Rock and Gem Society*

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## In Memoriam - Grahame Brown (1936—2008)

Grahame Brown, distinguished gemologist and longtime editor of *The Australian Gemmologist*, passed away January 15, 2008, after a battle with cancer. He was 71.

Although Dr. Brown was a practicing dentist until the end of his life, gemology became a fitting outlet for his remarkable intellect and energy. At the encouragement of a dentistry colleague in Brisbane, he began taking the Gemmological Association of Australia (GAA) diploma courses in 1973. The following year, Dr. Brown was awarded the association's diploma with distinction, an accomplishment he repeated with the Gemmological Association of Great Britain in 1975. Numerous other diplomas and professional affiliations would follow.

Dr. Brown began teaching for the GAA in Queensland in 1975. Over the next two decades, he held a series of leadership roles within the association, serving as its president from 1989 to 1993. The GAA named him an honorary life member in 1990. Meanwhile, Dr. Brown was contributing influential articles to the association's quarterly journal, *The Australian Gemmologist*, for which he served as editor from 1994 until his death. (Grant Pearson has been named the journal's new editor.)

In addition to operating his own gem identification and appraisal consultancy and teaching for the GAA, Dr. Brown taught gem identification at the University of Queensland from 1989 to 1992. He frequently lectured at conferences worldwide, including GIA's Second International Gemological Symposium in 1991. He was elected to the International Gemmological Conference (IGC) in 1995 and served as Australia's delegate to the CIBJO Congress in 2002 and 2004.

Dr. Brown was a prolific author, publishing more than 500 gemological papers. His Summer 1991 *Gems & Gemology* article on treated Andamooka matrix opal remains the definitive work on the subject. He was a contributing editor to the fifth edition of Robert Webster's *Gems: Their Sources, Descriptions and Identification* in 1994. From 2001 until his death, Dr. Brown was also editor of *The NC/V Valuer*, a gem and jewelry appraisal magazine.



Grahame Brown

Grahame Brown is survived by his wife, Helen, their three children, and six grandchildren. He will be missed by his many friends and colleagues throughout the world.

*From Gems & Gemology, Spring 2008.*

**The Editor - Grahame Brown had graciously given permission for the AOS to publish articles in the past. In addition, he was one of the major authorities of Andamooka matrix opal and established the treatment technique.**

## May 2008 Gem & Mineral Shows

**2-4--BISHOP, CA:** Show, "Eastern Sierra Gem & Mineral Show"; Lone Pine Gem & Mineral Society; Bishop Fair Grounds, Sierra St.; Fri. 6-10, Sat. 9:30-4, Sun. 10-3; free admission; dealers, minerals, fossils, jewelry, displays, demonstrations, flint knapping, gold panning, lapidary, children's activities, spinning wheel, free kids' rocks, door prizes; contact Jeff Lines, (760) 872-6597; e-mail: franceem@qnet.com

**3-4--ANAHEIM, CA:** 49th annual show, "Gem Roundup"; **Searchers Gem & Mineral Society;** Brookhurst Community Center, 2271 W. Crescent Ave.; Sat. 10-5, Sun. 10-4:30; family fun, kids' program, silent auctions, gold panning, grab bags, hourly door prize, dealers, tools, minerals, gemstones, jewelry, books; contact Betty Nelson, (714) 530-1365; e-mail: betty@azteche.com; Web site: www.searchersrocks.org

**3-4--BAKERSFIELD, CA:** Show, "Art In Stone"; Kern County Mineral Society; Kern County Fairgrounds, Ming Ave. and P St.; Sat. 10-5, Sun. 10-5; free admission; lapidary, gem, mineral and fossil displays, dealers, demonstrations, silent auction, grab bags, Spin-N-Win; contact Ismael Sanchez, 1200 Dolores St., Bakersfield, CA 93305, (661) 301-4609; e-mail: sbkelley@bak.rr.com; Web site: www.kcmineralsociety.org

**10-11--RENO, NV:** Show, "Jackpot of Gems"; Reno Gem & Mineral Society; Reno Livestock Event Center, Exhibits Hall, 1350 N. Wells Ave.; Sat. 10-5, Sun. 10-4; adults \$5, seniors \$4, children 6-12 \$3; dealers, demonstrators, exhibits, competition cases, door prizes; contact John Peterson, 480 Rock Blvd., Sparks, NV 89431, (775) 356-8820; e-mail: jtp@powernet.net; Web site: www.renorockclub.com

**16-18--ANDERSON, CA:** Show; Superior CA Gem & Mineral Association; Shasta District Fairgrounds; Fri. 9-5, Sat. 9-5, Sun. 10-4; contact Bill Seward, (530) 365-8641

**16-18--COSTA MESA, CA:** Annual show, "West Coast Gem & Mineral Show"; Martin Zinn Expositions; Holiday Inn - Bristol Plaza, 3131 S. Bristol; Fri. 10-6, Sat. 10-6, Sun. 10-5; free admission; 120 dealers, China, Brazil, Russia, India; contact Regina Aumente, P.O. Box 665, Bernalillo, NM 87004, (505) 867-0425; e-mail: mz0955@aol.com; Web site: www.mzexpos.com

**16-18--SACRAMENTO, CA:** Show; Gem Faire; Cal Expo/Bldg. A, 1600 Exposition Blvd.; Fri. 12-7, Sat. 10-7, Sun. 10-5; \$5 weekend pass; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

**17-18--NEWBURY PARK, CA:** 34th annual show, "Pageant of a Thousand Gems"; Conejo Gem & Mineral Club; Borchard Park, 190 Reino Rd.; Sat. 9-5, Sun. 10-4:30; free admission; mineral, rock and fossil exhibits, demonstrations, gem and jewelry sales, youth activities, door prizes, silent auctions; contact Robert Sankovich, (805) 494-7734; e-mail: rmsorca@adelphia.net; Web site: www.cgamc.org

**23-25--SANTA BARBARA, CA:** Show; Gem Faire; Earl Warren Showgrounds/Exhibit Hall, 3400 Calle Real; Fri. 12-7, Sat. 10-7, Sun. 10-5; \$5 weekend pass; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

**24-25--LAKESIDE, AZ:** Show; White Mountain Gem & Mineral Club; Blue Ridge Junior High School, 1200 W. White Mountain Blvd.; Sat. 9-6, Sun. 9-4; adults \$2, under 16 free; gems, minerals, fossils, rough, slabs, beads, jewelry, equipment, books, demonstrations, junior activities, silent auction, raffle, door prizes; contact Nanz Marshall, P.O. Box 3504, Show Low, AZ 85902, (928) 537-2524; e-mail: larrylegge@yahoo.com

**24-25--VIRGIN VALLEY, NV:** 4th annual show; thegemdealer.com, Opal Negra Mining; Opal Negra Millsite, Sage Brush Road; Sat. 10-5, Sun. 10-5; free admission; buying, selling, tailgating, carnelian field trip Mon.; contact Scott Ryals, Box 2543, Port Angeles, WA 98362, (800) 803-7601; e-mail: gemshow@thegemdealer.com; Web site: http://thegemdealer.com/gemshow/virginvalleygemshow.htm

**30-1--WOODLAND HILLS, CA:** Show, "Rockhound Roundup"; Rockatoms Gem & Mineral Society; Pierce College Campus, Victory and Mason; Fri. 10-5, Sat. 10-5, Sun. 10-5; contact Louise Gerik, (818) 347 1234

**31-1--GLENORA, CA:** Show; Glendora Gems; 859 E. Sierra Madre; Sat. 10-5, Sun. 10-4; contact Bonnie Bidwell, (626) 963-4638; e-mail: Ybidwell2@aol.com

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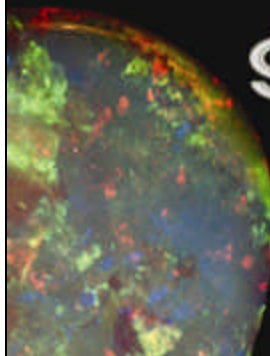
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*The Editor*

# The Opal Express

American Opal Society  
P.O. Box 4875  
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**Volume #41 Issue #5  
May 2008**

TO:

### Some Topics In This Issue:

- Jack Liu – Cutting in China Summary
- Cabochons: Hints, Tips and Strategy
- Appraising: Stories from the Trenches
- American Gemstones
- Gem tech - Vision Underground
- How to Make Opal Doublets
- In Memoriam - Grahame Brown

### Important Info:

**Board Meeting – April 29<sup>th</sup>**

### General Meeting - May 8<sup>th</sup>

John Rance and Dr. John Potter, of Alpha Gems from Adelaide Australia *The Opal Industry - Moving with the times.*

## May 8th Lecture

### John Rance and Dr. John Potter

### of Alpha Gems from Adelaide Australia

### "The Opal Industry - Moving with the Times"

### — GENERAL MEETINGS —

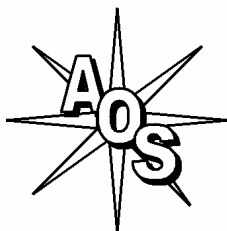
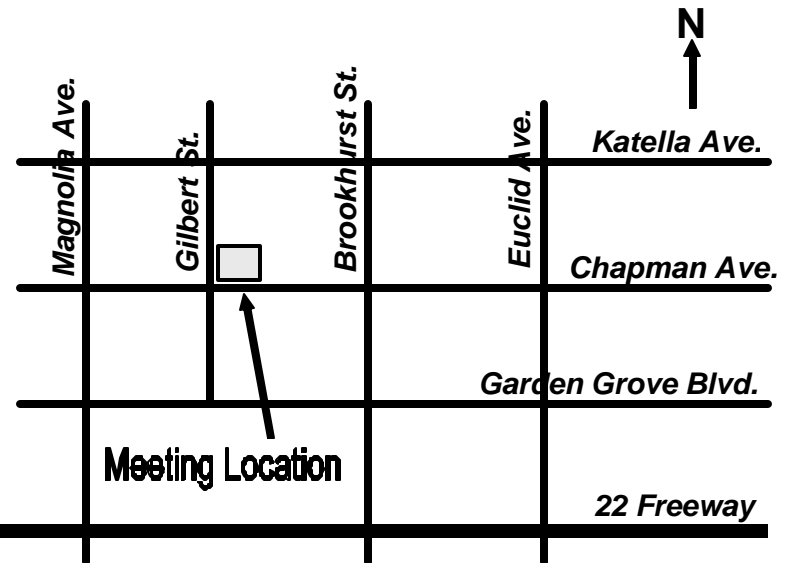
2nd Thursday of the Month  
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9501 Chapman Ave.  
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(NE corner of Gilbert & Chapman)

### MEETING ACTIVITIES

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



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