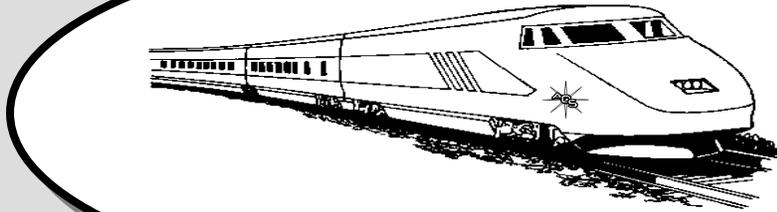


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Presidents Message

By Jim Lambert

All bidders and sellers had a great time at our Opal Auction meeting in June. Many great bargains were available and purchased by many bidders. The sellers were very happy to sell some items or even display (if not sold) items that may be available for our November Show at the White House Event Center at Hobby World. Yes - Some bidding wars started over some very hot items of Opal, Gems and jewelry.

Jack Liu will give a talk on gem cutting in China for this month's general meeting.

Thank you!

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: "america".

July's Speaker – Jack Liu

Mr. Jack Liu will be returning to be this month's speaker, describing his stone cutting service in China. Jack's talk will include the following:

1. Introduction about China, population, geography and culture.
2. Cutting stone factory history for about 30 years.
3. Cutting stone service and Jewelry factory in China for western countries.
4. Cutting stone service detail and price information.

Jack Liu was born and raised in Beijing, China. Mr. Liu obtained a bachelor degree in geology from the University of Petroleum, China. He immigrated to American in 1991 and obtained a Masters Degree in geology from the University of Wyoming in Laramie, Wyoming.

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 dealers, professional jewelers and gemstone collectors.

Jack will most likely have some products for sale; last time he had some excellent pearls for sale.

In addition, members can bring rough gemstones to Jack to be faceted or cabbed for a reasonable fee.

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

Quartz – The Most Remarkable of Lapidary Materials

Quartz is very abundant on planet Earth. It has very good hardness, comes in a vast variety of primary and secondary colors and includes hundreds of varying shades, tints and assortments in between. Quartz can be opaque, translucent or transparent as well as optical quality. Some qualities of Quartz may include asterism, aventurescence, chatoyancy, iridescence, or iris structure. Quartz varieties may contain visually stunning and dramatic inclusions or wonderfully realistic scenes in its varied patterns. Quartz has replaced Animal, Mineral and Plant (vegetable) matter as well as pseudomorphs of other mineral or organic matter.

Pure and true quartz is silicon dioxide, hardness of 7, a density rated at 2.65 and occurs naturally in coarse grains, masses or in distinct micro and macro crystals in all rock types. It belongs in the hexagonal crystal system – regardless of size when found. Colored varieties of Quartz are found with minute traces of iron, manganese, nickel, copper, and chromium.

Inclusions of the following can alter its appearance; actinolite, chlorite, chrysocolla, crocidolite, dumortierite, fuchsite, gases, goethite, hematite, hornblende, limonite, marcsite, muscovite, pyrite, rutile, tourmaline, water, and others.

Quartz is used in a variety of ways. Sand size quartz granules are used in mortar, concrete, as an abrasive or flux, and in manufacturing of silica brick and glass. In powder form, it is used in paints, porcelain, sandpaper, wood filler, and scouring soaps. Cut into prisms and lenses Quartz is used for scientific equipment. Quartz plates are used in watches while quartz oscillators are used to control radio frequencies. Quartz is also used in the production of electrical components and in all silicon semiconductors in the computer industry.

From May, 2009, of the *DESERT DIGGINS*, Mojave Desert Gem & Mineral Society Newsletter, <http://www.mdgms.org>

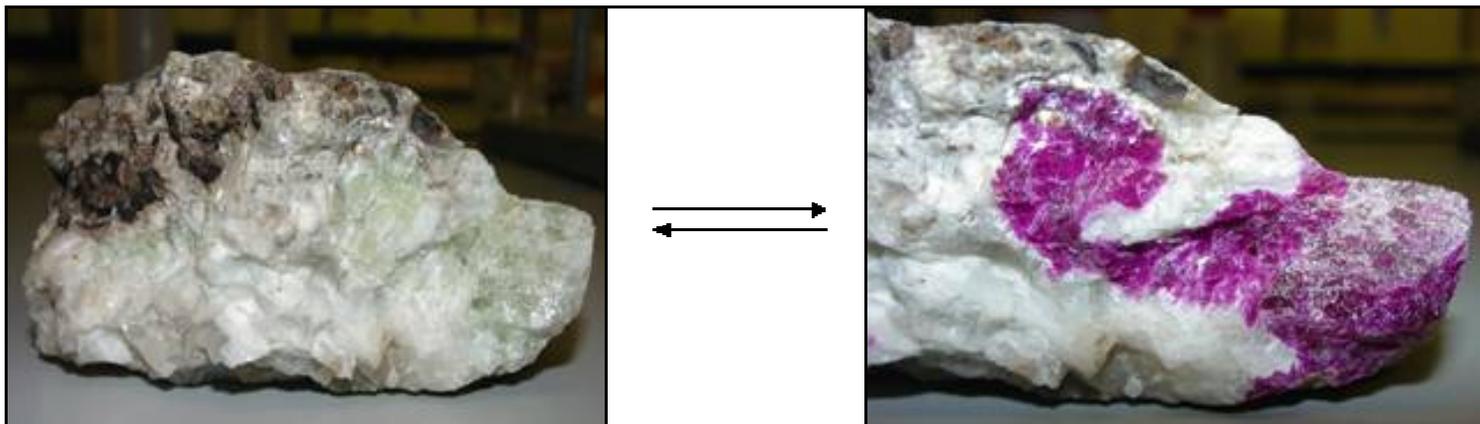


Figure 1. A mineral sample containing Hackmanite (from Kangerlussaq, Ilimaussaq, Greenland) before and after exposure to UV radiation (254 nm, 10 s 3400 mW/cm²).

Photosensitive Minerals: Hackmanite and Tugtupite

What is a Photochromic Material? **A material that undergoes a colour change in the presence of photonic energy.**

Materials that demonstrate reversible colour changes induced by exposure to radiation of various wavelengths, **photochromism**, have applications that include photochromic lenses, filters, information storage, smart coatings for windows/sun-blinds, specialist clothing and jewellery. Photochromic materials of most interest are those that colour when irradiated with UV radiation; in some systems this colour can be later bleached on exposure to ambient light, and the whole process is **fully reversible**. Of the few compounds exhibiting this desirable characteristic there are severe limitations in thermal, chemical, solvent and indeed photo-stability with them. Photochromic materials sensitive to UV radiation include a number of organic materials based on extended p -electron systems such as spiropyrans, benzochromenes and spiroxazines. They are well known but these molecular systems have poor long term light and heat stability reducing potential applications. Glasses containing silver salts are another photochromic material but the colouration range achievable is limited to, typically, grey and brown hues.

HACKMANITE

When the mineral hackmanite is first broken open, and exposed to white light it appears violet. Within a few seconds (to minutes) on exposure to white light however, it changes or "bleaches" to a pale yellow or green, or may even become colourless. Subsequent exposure to shortwave ultraviolet will cause the hackmanite to revert back to its magenta state. The violet colouration persists for seconds to minutes in daylight, or indefinitely if left in darkness or it bleaches back to colourless under ambient (daylight, room temperature) conditions (Figure 1).

Work in the laboratory has focused on preparing synthetic samples of hackmanite.

Hackmanite belongs to the Sodalite Family. The sodalite structure is an ordered framework of linked AlO_4 and SiO_4 tetrahedra in which Si and Al alternate on the tetrahedral sites. Six- and four-membered rings of $(\text{Al},\text{Si})\text{O}_4$ tetrahedra. The overall linkage of $(\text{Al},\text{Si})\text{O}_4$ tetrahedra results in cubo-octahedral cavities or so-called sodalite (b -) cages. The b -cages contain a centrally placed anion coordinated tetrahedrally to four cations (Figure 2). The flexibility of the sodalite structure allows a wide range of cations and anions to be substituted into it:



C can be Li^+ , K^+ , Fe^{2+} , Zn^{2+} , Mn^{2+} , Ca^{2+}
T1 : Al^{3+} , Ga^{3+} , Be^{2+}
T2 : Si^{4+} , Ge^{4+} , Al^{3+}

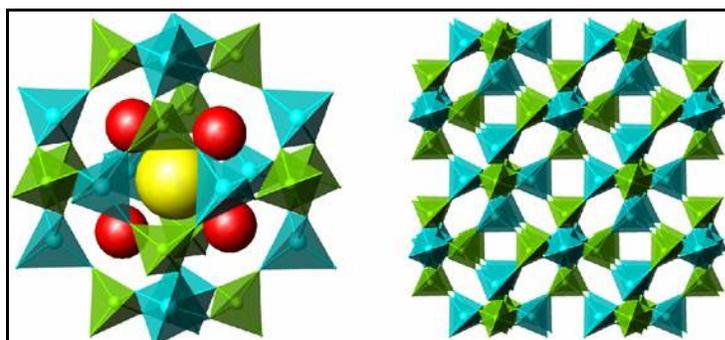


Figure 2. Left: A single sodalite cage formed from SiO_4 (green) and AlO_4 (blue) tetrahedra containing sodium ions (red) and chloride ion (yellow) Right: The full sodalite framework formed from linked tetrahedra

TUGTUPITE

Tugtupite was discovered in 1957 and its name is derived from the locality where the mineral was originally found: Tugtup agtakórfia in the Ilimaussaq intrusion, South Greenland. The formula of the mineral is: $\text{Na}_8\text{Al}_2\text{Be}_2\text{Si}_6\text{O}_{24}(\text{Cl},\text{S})_2$. It too has a sodalite structure except that it is very unusual and interesting in that it has **three** different T atoms- i.e. Al, Be, Si.

Tugtupite, like hackmanite, is tenebrescent. Tugtupite varies in colour from white, pale pink to dark cyclamen red, and an exceptionally rare light blue variety. Some light coloured varieties of tugtupite, especially pale pink material, will intensify in colour as a result of exposure to shortwave UV radiation or strong sunlight (but not artificial light). The intensified colour fades if the specimen is placed in darkness for an extended period but is quickly restored when it is exposed to UV radiation again. Deep red



Tugtupite Mineral, Kvanefjeld, Ilimaussaq complex, Narsaq, Greenland



Tugtupite cabochons used in Jewellery

tugtupite has been used as gemstones since 1965. The first successful synthesis of tugtupite has been achieved.

From <http://www.soton.ac.uk/~solids/photochromic.htm>

+++++

Broken Opal during Setting

Here's an interesting thread from Ganoksin Orchid Digest on setting opal – always a problem! The Editor.

Dated from 2/2/09 to 2/14/09

From Helen Hill

Well, I'm kicking myself today. Hubby bought me a large boulder opal cab and two smaller ones (all solid) at a trade show last year for my Valentine's Day present. Last week I decided it was time to make them into something and so I made a sterling silver and gold pendant and set the blue boulder opal with lab tanzanite. I made earrings to go with it too and was setting the earrings today, when I broke one of the opals! I'm gutted.

Let's hope I've learned my lesson this time. You see, I'm too heavy-handed sometimes. You know how you can make the settings to fit the stones beautifully, but by the time you've soldered the settings onto other bits of metal, they can sometimes be a bit tight - perhaps a bit of solder has flowed inside the bezel somewhere? This was the case today. As soon as I discovered that the opal no longer fitted nicely into its setting, I should have taken some action to ease the setting - but no, I did something that works with harder stones on most occasions. I placed a folded paper towel over the stone and gently persuaded it with my setting tool and chasing hammer and of course it broke. It broke right across the middle and most of the layer of colour parted company with the ironstone underneath. I'm SO cross with myself and it was just my impatience. I should have known not to temp fate with opals as they are so delicate.

We're going to the same trade show tomorrow, so I'll be on the lookout for another pair for my earrings.

Helen - who needs to learn some patience and not just hope for the best., UK

From Teresa Masters

Helen,

This gives you the perfect opportunity to be creative. Look carefully at the halves of your stone, and visualize perhaps a line of silver or gold separating the two, making them whole again. There are so many possibilities, perhaps a decorative silver or gold design across the break. Think of inlaying or channeling. Do not give up on this. I did exactly that on Friday, and simply put it aside for a day when I can once again look at it and free flow imagination. I have broken a number of stones over the years, and some far too

beautiful to discard. Usually worked out in a far more interesting manner.

Hugs,
Terrie

From Lisa Gallagher

Hey Helen,

Terrie has a point there. Maybe not a final solution for your earrings, since you'd have to break the other one too to make them match, but something to consider for later for another piece. You'll have to put it away for a bit first, though, to distance yourself from the pain of wrecking the stone. I had something similar to that happen several years ago, and I was reminded of it just the other day as I was sorting through my stones (clearing out ones I figure I'll never use, reorganizing the rest). Back when I was in Pforzheim, so this was more than 7 years ago (since it's before Henry was born), I was making a difficult setting for a really pretty triangular moss agate cab. Lovely stone with just the right balance of copper and green colored stuff floating in a sea of clear. I'd even stitched a seed bead chain for it to hang on, in a bead color that just matched the coppery things in the stone. The setting had taken a lot of work, and I was almost done with it. I put the stone in to test how it looked, whether it hung evenly on the chain, and then went about tweaking the hooks in the back just a bit. After soldering it went into the quench cup and then I saw something fall away from the setting. AAGHH!!! I hadn't taken the stone out! I'd turned it over to look at the back, then forgot to turn it back around and notice that the stone was still in there before I started resoldering. The stone clouded up and cracked into two pieces. It clouded up evenly, and the crack was very tidy, I could put it back together and you'd couldn't see the crack unless you held it in the light just right. I couldn't make it to sell like that, though. I didn't throw it out, but I couldn't use it as planned. I was heartbroken, angry, frustrated, etc. The setting was custom for that stone, so I couldn't just grab another triangular cab for it. In my enameling class I tried to make a triangular enameled piece to go into the setting instead, using the same basic copper and green colors, since I'd already made a chain for it in that copper color. Problem was, everything I did looked like a slice of pizza! Agh! In the end, I trashed the setting I made because I just couldn't seem to make anything new for it (yeah, I probably should have kept it, you never know, but I was very angry with it at that point). I made a new marquis shaped pendant and enameled it, again in that coppery color, and was very pleased with the resulting necklace. I came across the stone some time later and realized that after the pain had passed it was actually kind of a cool stone in its own right, even if it wasn't the same clear pretty thing it had been. Some day I'll come up with a new use for it. Some day...

Lisa

Designs by Lisa Gallagher

www.lisagallagher.com

From Ken Thomas

I once did that and then I cut thru the stone and glued a gold strip in it before re-polishing. Looked like I planned it that way!!!!

Helen Hill

Dear Terrie, Lisa and Ken,

I wish your suggestion was possible. However, as I said, the colour vein/layer pretty much completely parted company with the ironstone layer on one of the stones (and yes they were solid boulder opals. The seller I bought from does not deal in doublets or triplets - I was just too heavy-handed) - there's nothing salvageable I'm afraid. It's a shame, as they were such a beautiful pair of stones. Unfortunately, I ran out of funds at the trade show and so couldn't afford to replace them. Maybe next time.

Thanks though.

Helen, UK

From Kevin P. Kelly

Not to start a long debate but there are boulder opal doublets which are not as easily recognized as the more traditional doublet.

> *the colour vein/layer pretty much completely parted company with the ironstone layer on one of the stones (and yes they were solid boulder opals.*

Helen, your statement pretty much assures that you had a doublet. Opal does not form in a manner that the color layer would separate as you describe. The color in boulder opal is distributed in a random manner.

A fairly convincing way to distinguish a doublet is to look at the side of the stone; if you see a straight line of demarcation it's a doublet.

Making 'boulder' opal doublets is a recent phenomenon. It's also unlikely that what you had was a boulder opal. Boulder opal does not form in such a way to allow it to be used in the making of a doublet.

A stone that has a deep brown matrix is not necessarily a boulder opal. There are a number of stones from Queensland Aus. that fit your general description. There are about 90 to 100 types of opal in Australia that can be distinguished one from another.

Having said all that the only certain way to identify the stone you refer to is to see it live.

KPK

From Kevin P. Kelly

In my career as a cutter rough material has become increasingly difficult to find.

Tucson AZ has what is reputed to be the largest 'gem' show in the world at this time of the year. There are quantities of rough stone for sale at Tucson; but I can think of only two people who sell QLD rough and the quality is pretty low.

When I first started cutting 'matrix' thirty years ago some Aussies saw what I had and said "We throw that cr*p away at home". I bought material at that time for \$20 US/lb. Within a couple of years dealers wanted \$1200/lb. I cut the material 'ironstone matrix' in a way that was not done before. The Aussies liked the look of it and the prices went up.

The previous 'war story' is meant to illustrate why material is manipulated more and more in various ways.

"cui bono"

KPK

From Daniel Spierer

> *Making 'boulder' opal doublets is a recent phenomenon*

Not so. I began to run into them as long as 15 years ago or more.

Daniel R. Spierer, G.G.

Daniel R. Spierer Jewelers, LLC

www.spijerjewelers.com

From Derek Levin

I have to disagree with the fellow about the opal separating from the iron stone. I have seen this phenomenon many times. The obvious way to tell whether this was a doublet or not is if it separated absolutely flat. If the two pieces did that, then there's a good chance it's a doublet. Also even after separation, if it's a doublet some glue would remain on either the opal or the ironstone and would be a lot softer than the stone so that it would scratch easily with a knife.

Often however with boulder, the opal will do a conchoidal fracture meaning cupped and more or less shell like. I believe this tends to happen with older stones that have been out of the ground longer, but that's only an observation rather than the product of systematic experimentation. Frequently also this will have a layer of rather dull and ochreish potch where the ironstone and opal separated.

For the person who asked the original question, I have a fair amount of boulder opal, but opal is notoriously difficult to match for

color, size and pattern. However if you want to forward me a photo of the remaining opal with specs, I can take a look.

Derek Levin

From Bruce Holmgren

> *Not so. I began to run into them as long as 15 years ago or more.*

I think that it has been longer than that. I think that the use of the words "boulder opal" to describe these doublets has changed the meaning of the term. I can not tell you how many dealers of this material have been calling it "boulder opal". Because of the cushion of colored glue between the opal and matrix, I gave up setting this stuff long ago and have used glue almost exclusively. It is really the only opal that I won't hammer set.

Bruce Holmgren

JACMBJ

From Kevin P. Kelly

Daniel, Bruce, Derek -

The difficulties in discussing 'Helen's stone' is that we have not seen the stone 'live'. It's similar to the story of the blind men examining an elephant.

There is more misinformation about Queensland opal (opal in matrix) than any other material. It is more often misidentified because different varieties can look very similar.

This reply is not to deny the truthfulness of what has been posted. It's just that this discussion is entirely hypothetical, none of us having seen the stone.

Not to speak from a position of authority, but I've never seen an example of what Derek describes. I've been cutting 'matrix' since 1976 and cut more than most single individuals; but anything is possible in the world of opal. There's always something one has not seen before which makes it so interesting beyond its beauty.

KPK

From Helen Hill

Hi Kevin,

> *your statement pretty much assures that you had a doublet.*

I knew as soon as I said that, that someone would assume it was a doublet, which is why I pointed out that to my knowledge, it isn't. What I mean is that SOME of the colour has parted company, rather than the stone just splitting in two. In other words, it is not suitable for the strip of silver along the crack treatment. There is some colour still there but it just looks badly damaged and not useable.

> *A fairly convincing way to distinguish a doublet is to look at the side of the stone; if you see a straight line of demarcation it's a doublet.*

As well as the line of demarcation, there was a vertical vein of colour going right from the top of the opal to the bottom of the ironstone. That doesn't sound like a doublet to me. Unless of course, there are some very clever people constructing doublets with vertical veins of colour as well, so as to convince and deceive buyers. I understand you thinking it's a doublet and I suppose when all is said and done; it could still be a doublet. However, the Australian dealer I bought it from built his business on the ideal that he does not deal in doublets or triplets - only solid material - and so I can only go on his assurance that what I have is a solid opal.

To Derek,

> *The obvious way to tell whether this was a doublet or not is if it separated absolutely flat.*

My original post was somewhat misleading in that I said the colour layer had parted company from the ironstone. I didn't mean completely, but rather too much to make use of the stone. There are still patches of colour.

> *Often however with boulder, the opal will do a conchoidal fracture meaning cupped and more or less shell like.*

This happened too, at the tip of the one I have left!

> *Frequently also this will have a layer of rather dull and ochreish patch where the ironstone and opal separated.*

Yes, this exactly describes the layer between the colour and the ironstone.

> *However if you want to forward me a photo of the remaining opal with specs, I can take a look.*

Thanks very much for the kind offer. I'll try to get a photo of it in the next couple of days.

To all who have responded, thanks, and I will post a photo as soon as I've had time to capture one.

Helen, UK

From Marianne Hunter

Kevin Patrick Kelly, for those of you who haven't seen his work, is the best cutter/polisher of matrix opal I've ever been lucky enough to come across! I get beautiful material from a lot of cutters/dealers, but Kevin's eye and finish are beyond compare. Perhaps it's because Kevin isn't cutting "for the trade" (as far as I know), but each is cut to present in his own jewelry which he then, literally, stands behind at retail shows. On rare occasions he has allowed me to buy one of his stunning stones to incorporate in my work, much to my real delight! So, when Kevin speaks on opal...take his word for it! He is a gentleman, his integrity is beyond reproach and he is a true opal nut! (and no, Lynn, nothing to worry about... I don't have eyes on your husband, just his opals!) Opal nut myself, Marianne

Marianne Hunter

<http://www.hunter-studios.com>

From Kevin P. Kelly

> *As well as the line of demarcation, there was a vertical vein of colour going right from the top of the opal to the bottom of the ironstone. That doesn't sound like a doublet to me.*

You totally miss the point of 'line of demarcation. It's hazardous to make statements about a stone that's not in front of one. And if your description had been accurate all these posts would have been unnecessary.

KPK

From John Donovan

> *Kevin Patrick Kelly, for those of you who haven't seen his work, is the best cutter/polisher of matrix opal I've ever been lucky enough to come across!*

Marianne beat me to it...There are people in the world who know more about opal than Kevin, mostly in Australia. For most of us, and certainly here on Orchid, he qualifies as our resident expert. Much knowledge, much experience, and pretty deeply immersed in the opal trade, too. Listen to him.

All of the "opal matrix" I've ever seen was an opal seam or seams cut with the ironstone backing behind it, and natural opal on top. I've never heard anybody call such a thing a doublet, till now.....Doublets are obvious, but I'm not an opal expert, either..

<http://www.donivanandmaggiora.com>

From Helen Hill

> *All of the "opal matrix" I've ever seen was an opal seam or seams cut with the ironstone backing behind it, and natural opal on top. I've never heard anybody call such a thing a doublet, till now..*

This describes my stones - opal seam cut with the ironstone backing behind it.

Doublets are obvious, but I'm not an opal expert, either..

I agree, doublets ARE obvious. Many times, I have been able to spot an opal doublet just from a photograph. The quartz (or whatever) layer on the top has a distinctly different appearance to real opal. As I pointed out, one of my opals had a vein of colour going vertically through the stone as well as horizontally across the top of the stone so it certainly did not speak doublet to me.

Kevin - who I do respect greatly - says I've not been accurate in my description. If you read my original post on the subject, when I said "It broke right across the middle and most of the layer of colour

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parted company with the ironstone underneath", that still pretty much describes what happened. I don't think that was misleading at all. If one assumes it's a doublet, then you would read what I wrote, thinking that the quartz topping and thin opal layer completely split from the backing - it's all a matter of interpretation. But what I said can equally apply to natural boulder opal (or matrix as you call it). The opal layer is clearly a different substance to the ironstone it sits upon, and can thus behave differently when under stress. Therefore, when I was careless, some of the opal layer did indeed part company with its backing and some remained, but it is a mess and not salvageable - but that does NOT mean that it is a doublet. And I must point out that it wasn't a cry for help - it was merely a rant on my part, as I was cross with myself for breaking my stone. People answered, offering suggestions as to how I could possibly use the stone and it then became necessary to qualify exactly what damage I'd done. I have not tried to mislead anybody. I always attempt to describe things clearly.

I do appreciate everyone's suggestions, and a couple of people have asked for photographs which I will try to capture as soon as I can.

I hope this clears up what I have been trying to say.

Helen, UK

From Richard Hart

> *Many times, I have been able to spot an opal doublet just from a photograph. The quartz (or whatever) layer on the top has a distinctly different appearance to real opal.*

Interesting that someone can tell a doublet from a photo. An opal with quart on top is usually a triplet and doublets are usually opal on top with backing beneath.

I might not be able to tell a doublet from a photo and I have hundreds of opals, doublets and solid opals. I have Mexican jelly opal, Ethiopian, Brazilian, Australian crystal, black, boulder, Yowah, Koroit, Winton matrix, and Oregon opal.

Doublets with opal on top and a backing of ironstone can be made with a bonding material that is the same color as the ironstone or ironstone is crushed and mixed with the glue so the back of the opal can be an irregular surface and the seam where the opal and the ironstone meet is hard to discern.

One could laminate a piece of opal with ironstone on both sides and it would be difficult to detect.

Opticon can be (is) used to fill fractures and divots in opals. A fractured opal treated with Opticon might separate when pressure is applied while setting.

I am with Kevin, without a picture all is speculation. With a photo those of us with years of experience might be able to tell if a doublet de-laminated or if the opal fractured. When setting opal there is a distinct sound when an opal is broken. I do not usually hear it when there is a small chip while setting.

The same quality of boulder opal that is a \$30 doublet can be \$300 when it is a solid opal.

One of the most beautiful opals I ever had the pleasure of owning was a crystal opal with vivid neon blue and green that rolled around as you moved the stone around. It was a doublet with a black base that provided the background that made the color stand out. I do not think the colors would have been as dramatic without the black background.

Richard Hart G.G.

Jewelers Gallery, Denver, CO

From Helen Hill

Dear Richard,

> *An opal with quart on top is usually a triplet and doublets are usually opal on top with backing beneath.*

I actually meant to say triplet. Perhaps the ones in the photographs I'm talking about were so bad that the quartz layer on the top of the triplet was so obvious, and believe me, they were obvious. I'm 100% sure there are plenty of doublets and triplets out there that I would not be able to tell apart from solid.

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> I am with Kevin, without a picture all is speculation. With a photo those of us with years of experience might be able to tell if a doublet de-laminated or if the opal fractured.

I know I don't have years of experience with opal and as I said to Kevin, he may well be right - it may be a doublet boulder opal alter all - but I was only going on what the dealer told me - that he doesn't deal in doublets or triplets. Maybe I'm too trusting. But I also pointed out that there was a vertical vein of colour going right through one of the stones from top to bottom, front to back, as well as the horizontal layer of colour that the stone was cut to show off and I still stand by my opinion that that probably means it is solid after all. Nobody has commented on that though. The stone is now set so I can't take pictures to show you but you'll have to take my word for it.

Anyway, my original post was just a rant on my part and not something that was supposed to incur strong opinion on whether or not my opals were solid.

Helen, UK

From the Orchid Digest from <http://www.ganoksin.com> , Printed with permission of Ganoksin

Using a Digital Camera to Photograph Slabs, Cabs, Gemstones, Minerals and Jewelry - Part 1

By Ron Gibbs, 5 June 2009

Over the next several months I will be writing a series of articles on using digital cameras to capture items related to our hobby. I now have a ready supply of material since I am just finishing the preparation for teaching a class in the topic at William Holland Lapidary School. My company bought me a Mac II color computer in 1987 and I saw what real color digital images could look like, wow, I was impressed. I was a very early user of digital cameras, the first one that I used (notice I did not say owned, again my company bought one for me to evaluate) was from Panasonic, and dated back to 1989 - 1990. They produced a digital still camera with something like 320 x 240 pixels of resolution for the



Calcite Crystal

price of only \$2500. It used, small, roughly 1 inch floppy disks to save the images in almost real time. Color photos, well not at this time and price point.

In 1990 I managed to get a copy of Photoshop with the PhotoMat icon and began to play with digital images, I closed down most of my personal "wet chemistry" darkroom that same year as I believed I saw the future, and it was digital photography.

In 1994 I got my hands on my second digital camera, the Apple Quicktake camera which doubled the resolution to 640x480 pixels and could save 8 full size images for only \$750. And it had Color! How could things get any better?

It has taken about 20 years for the digital camera to achieve the same general resolution as film, but digital editing (Photoshop) provided advancements in image control never fully realized by the "wet chemistry darkroom". I spent much of my time developing digital techniques to adapt to science since I was once a chemist with a strong interest in photography.

I will break up the future articles into the following main topics and proceed accordingly. There will likely be more than one article devoted to each topic.

1.) The Camera - what are the minimal requirements of a camera to produce reasonable digital images from the afore mentioned subjects.

2.) The Camera Controls - what are the most important settings, and why select them for virtually all of the photography.

3.) Lighting - the often overlooked critical element in taking the photographs - the "Color" of light, the quality of light and its placement.

4.) Lighting setups for each of the subject types, and backgrounds

5.) Adobe Photoshop or Adobe Elements for editing the photos and getting the most from each image. Which tools are easy and fast for most users.

6.) What can I do with all these images now that I have created this library of photos?

So let's begin with camera specifications for use in close-up digital images of lapidary materials.

1.) The Camera Specifications -

We may as well start with the number one marketing topic for digital cameras ... Resolution. This seems to be the topic most often discussed when describing a digital camera and, what makes it better than another. In reality it has become one of the least important topics for most camera users. Notice I highlighted the word "marketing", it has become more of a marketing gimmick than a useful function for sometime. Resolution is given in terms of total pixels, we have 2 mega pixel (MP = millions of pixels) cameras, 4 MP, 8 MP up to about 20 MP today. The resolution you need is solely dependent upon the final use of the image.

There are generally two uses for images, they can be used to display on a monitor (WEB, e-mail, pdf based newsletter, or slideshows.) For this use, most computer monitors display 1024 x768 pixels of resolution, that's less than 0.8 MP! If we want to show full resolution slides on our high definition TV, it is now 1912 x 1080



Citrine, Rose de France (Amethyst), Ametrine

pixels for full screen, or only slightly over 2 MP off total resolution.

For users who do not want to print images, and only want to electronically display them at high quality, they rarely need more than 4 to 5 MP of resolution. Try to find a digital camera with that low of resolution today.

For those interested in printing pictures, you do need more resolution. It's actually because all of the printing technologies have to use patterns of dots to create a full spectrum of colors. This technique, called dithering, requires more pixels to achieve the same visual resolution that a monitor does. At the low end of the



Stone Canyon Jasper Cabochon



Gaspeite, jasper, opal in sterling silver

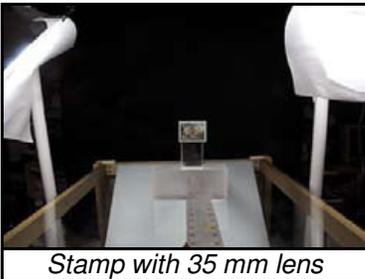
close-up images? The camera needs "macro" capability. "Macro" means that the camera can "fill the frame" with the subject. Digital images cannot be blown up beyond their highest original resolution without loss in image quality.



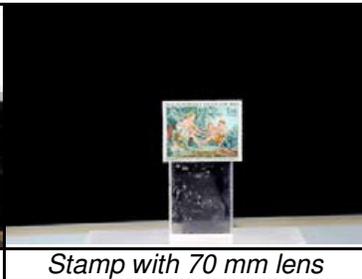
Porcelain Jasper (aka Scifi Jasper, Exotica Jasper, etc. etc.)

1150 pixels in size.

Notice the resolution/quality difference in the three blow-ups above. The first is with the 35mm lens, the second with the 70mm



Stamp with 35 mm lens



Stamp with 70 mm lens



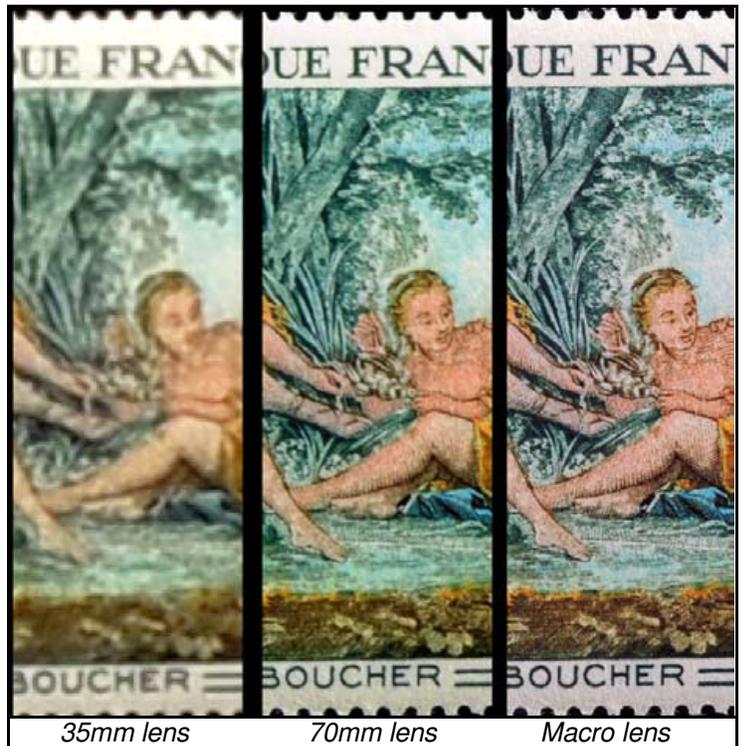
Stamp with Macro lens

From the Charlotte Gem & Mineral Club's newsletter - the Gold Rush Ledger - From <http://www.charlottegem.com/newsletters/june2009web.pdf>,

scale, you need about 2 MP to create a reasonable 8 inch by 10 inch print. If you want the best possible 8x10 print then about 8 MP is recommended. If you are going to print enlargements that are 11x14 or 16x20 inches in size, then higher resolution camera may be the ticket for you.

For most people, non-photo pros, 8-10 MP is over kill as far as resolution is concerned. So what else is important for shooting

Let's look at the examples to the left. Each photo is full frame and is about 3000 x 2000 pixels of total resolution. In the first image the stamp is roughly 228 x 174 pixels in total size. In the second image it is 670 x 510 pixels in size, and in the last image it is 1500 x



35mm lens

70mm lens

Macro lens

Boy Hit by Meteorite Travelling At 30,000 mph

10:22am UK, Friday June 12, 2009

A teenager was hit by a meteorite travelling at 30,000 mph - and lived to tell the tale.

The meteorite struck Gerrit on the hand, and buried itself in the road. Gerrit Blank was on his way to school when he saw a massive fireball heading straight towards him from the sky.

The white-hot meteorite bounced off the schoolboy's hand and hit the ground so hard it left a foot-long crater in the tarmac - as well as a three-inch scar on his hand.

Gerrit, 14, said: "At first I just saw a large ball of light and then I suddenly felt a pain in my hand. Then, a split second after that, there was an enormous bang like a crash of thunder. The noise that came after the flash of light was so loud that my ears were ringing for hours afterwards. When it hit me it knocked me flying and then was still going fast enough to bury itself in the road."

Scientists are now studying the pea-sized meteorite, which crashed to Earth in Essen in Germany.

Chemical tests on the rock have now proved it is from outer space. Ansgar Korte, director of Germany's Walter Hohmann Observatory, said: "It's a real meteorite, therefore it is very valuable to collectors and scientists."

Chances of being struck by a meteorite are around one in 100 million.

Mr Korte said: "Most meteorites don't actually make it to ground level because they evaporate in the atmosphere. Of those that do get through, about six out of every seven of them land in water."

There is only one other known case of a human being surviving a direct hit from a meteor. A grapefruit-sized meteor crashed through the roof of a house in Alabama, in the USA, in 1954. After



smashing through the top of the building, it bounced off furniture and then hit a woman who was asleep at the time.

From <http://news.sky.com/skynews/>

July 2009 Gem & Mineral Shows

5-7--WOODLAND HILLS, CA: Show, "Rockatomics Rockhound Roundup"; The Foundation of Pierce College, Rockatomics Gem & Mineral Society; Pierce College, Victory Blvd. and Mason St.; Fri. 10-5, Sat. 10-5, Sun. 10-5; free admission; gems, jewelry, tailgate selling, dealers; contact Linda Ralph, (818) 887-9791; e-mail: show@Rockatomics.org; Web site: www.Rockatomics.org

6-7--LA HABRA, CA: Show, "Jubilee of Gems"; North Orange County Gem & Mineral Society, City of La Habra; La Habra Community Center, 101 W. La Habra Blvd.; Sat. 10-5, Sun. 10-5; free admission; dealers, demonstrators, exhibits, youth activities, gold panning, geode cutting; contact Richard Schirer, 14602 Calpella St., La Mirada, CA 90638, (562) 944-9445; e-mail: rich477@ca.rr.com

6-7--SAN FRANCISCO, CA: Show, "The Great San Francisco Crystal Fair"; Pacific Crystal Guild; Fort Mason Center, Bldg. A, Laguna and Marina Blvd.; Sat. 10-6, Sun. 10-4; adults \$6, children under 12 free; gems, jewelry, crystals, beads, psychics; contact Jerry Tomlinson, (415) 383-7837; e-mail: sfxlt@earthlink.net; Web site: www.crystalfair.com

13-14--BUTTE, MT: Show; Butte Mineral & Gem Club; Civic Center Annex, 1340 Harrison Ave.; Sat. 10-6, Sun. 10-5; contact Pete Knudsen, (406) 496-4395

13-14--CAYUCOS, CA: Show; San Luis Obispo Gem & Mineral Club; Cayucos Veterans Memorial Hall, 10 Cayucos Dr.; Sat. 9-5, Sun. 9-5; free admission; gems, minerals, fossils, lapidary rough, jade, meteorites, moldavite, beads, cabochons, jewelry, carvings, crystals, micro-mounts; contact Michael Lyons, 1200 Camino Del Roble, Atascadero, CA 93422, (805) 610-0757; e-mail: jadestar@charter.net

19-21--SAN DIEGO, CA: Show; Gem Faire Inc.; Scottish Rite Center, 1895 Camino del Rio S.; 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

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Are Your Dues Due Now?
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.
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 Thank you,
 The Editor



The Opal Express

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**Volume #42 Issue #7
July 2009**

TO:

Some Topics In This Issue:

- Remarkable Quartz
- Photosensitive Minerals
- Broken Opal during Setting
- Digital Camera to Photograph Cabs
- Boy Hit by Meteorite

Important Dates:

July 7 - Board Meeting

July 9 - General Meeting

Speaker: Mr. Jack Liu on his stone cutting service in China

- Will have items for sale
- Will accept rough to cut

— GENERAL MEETINGS —

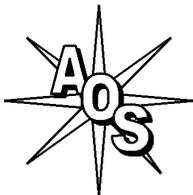
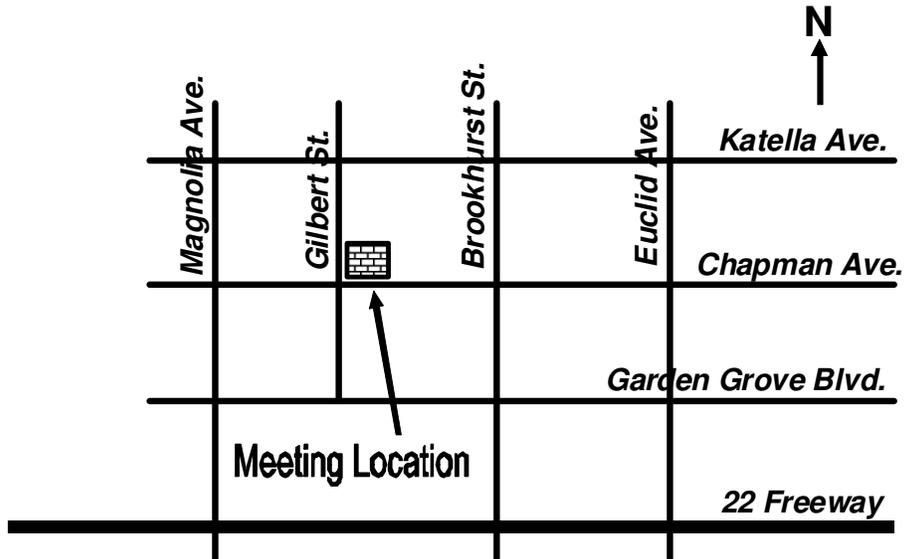
2nd Thursday of the Month
7:00 pm - 9:00 PM

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

MEETING ACTIVITIES

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

July 9 Mr. Jack Liu on Gem Cutting in China



The American Opal Society

<http://OpalSociety.org>

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