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

Volume #37 Issue #2
February 2004

Some Topics In This Issue:
Rainbow Calsilica
AOS in Quartzsite
AOS Founder Article
Amber – is it Fake?
Opal in Water
Meteorites in Antarctica
Cutting Obsidian

TO:

Important Info:

Board Meeting
February 9th

General Meeting
February 12th

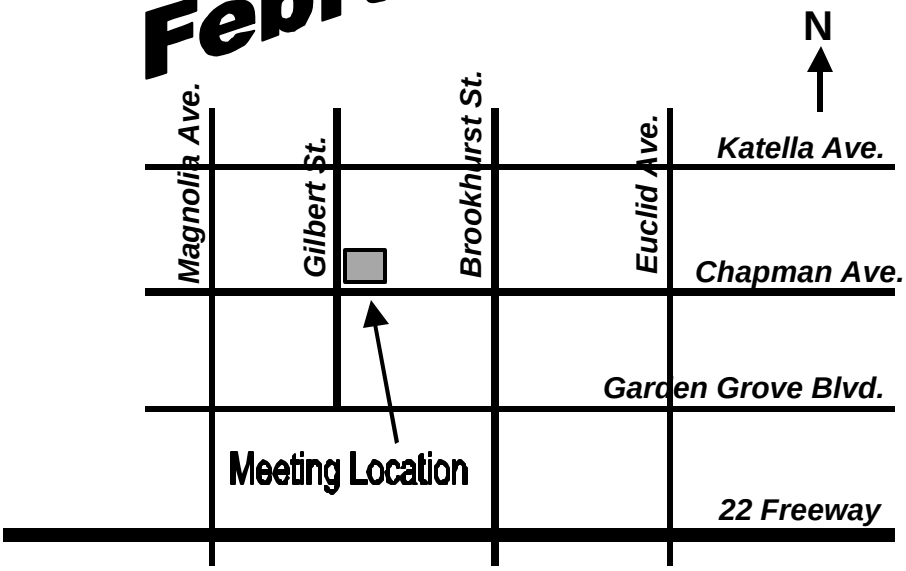
Meeting Speaker:
Dr. Walt Johnson -
How to Set Opal

— GENERAL MEETINGS —

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

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

General Meeting February 12th



The American Opal Society			
http://opalsociety.org			
Pete Goetz	President	(714) 530-3530	email: mgoetz2@socal.rr.com
Pam Strong	Vice President	(714) 896-3420	email: pamela.k.strong@boeing.com
Mike Kowalsky	Treasurer	(714) 761-4876	email: mykowalsky@aol.com
Jay Carey	Opal Show Chairman	(714) 525-7635	email: jaycarey@gte.net
Jim Pisani	Editor & Webmaster	(562) 797-5239	email: webmaster@opalsociety.org

American Opal Society Membership Renewal

Thank you for continuing to support your American Opal Society!

TYPES OF MEMBERSHIP		DUES / FEES)	AMOUNT PAID
DUES: SELECT ONE	*All US Addresses including Alaska and Hawaii*	$25.00	
	International Members = All addresses outside of US Addresses	$30.00	
ADDITIONAL BADGES = $5.00 each (First Badge free when joining)		$5.00	
ONE TIME INITIATION FEE = All New members		$10.00	
SENIOR DISCOUNT = Age 65 or over deduct $5.00		-$5.00	
TOTAL PAID – DUES, less Senior Discount plus Badge plus Initiation Fee (if Applicable)			

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

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

NAME		
BUSINESS NAME		
ADDRESS		APT #: or PO BOX
CITY	STATE	ZIP or POSTAL CODE
COUNTRY (IF OUTSIDE USA)		
PHONE: Home ( )	Business ( )	FAX ( )
E-MAIL	WEBSITE	
OCCUPATION:		
HOBBIES AND INTERESTS:		

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

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

☐ Address ☐ Phone ☐ E-mail ☐ Website

☐ Include my name & address on a list provided to the Dealers selling at our Annual Opal & Gem Show.

If you checked any box above, please sign here: _____ Date_____

Without your signature here you will not be included in the member info list or included in the dealer roster.

The Opal Express is published monthly by
***The American Opal Society*.**

Editor-Jim Pisani
Please address all inquiries and exchange newsletters to:

The Opal Express C/O
Jim Pisani
P.O. Box 4875
Garden Grove, CA 92842-4875

Email: webmaster@opalsociety.org
Article Deadline is the 20th of the month prior to each issue

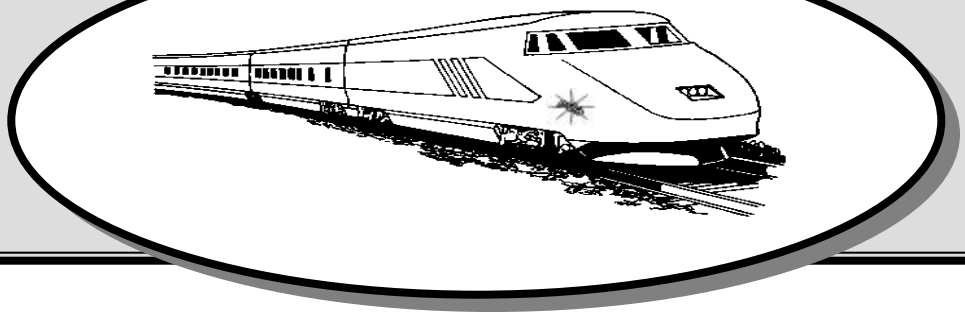
Are Your Dues Due Now?

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.

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

Thank you,
The Editor

The Opal Express



Published monthly by The American Opal Society

February 2004

Volume 37 Issue 2

Table of Contents:

++

President's Message

By Pete Goetz

HI Folks,

I apologize for the condition of last months President's message. I must have sent the rough draft to the editor instead of the finished piece.

Not to sound like a broken record... but this is the start of a new year. There is a lot of fun "stuff" on the drawing board, and there is a lot of mundane "stuff" that needs to get done.

I have mentioned several times the AOS Board is planning some fun activities for this year. However, these activities require some planning and more importantly, require member volunteers to help make these activities happen. Along the same line, even volunteer organizations need organization. I would like to encourage new members and those of you who have been members for awhile, to come forward and take a more active roll in the future of the American Opal Society.

This is an election year for the AOS. We will be looking for a new President and Vice President in December. We need a Treasurer right now. There are some committees we would like to establish to help with annual show. So as you can see (read), there is a lot to get involved with.

More later!

++

February Speaker – Dr. Walt Johnson

Lifetime member Walt Johnson will give a presentation on the different ways to set opal. Don't miss it!

++

Members Only Website Password

The Members Only" protected area on our website, http://opalsociety.org/aos_members_only_area.htm, has had the password changed this month. An account name and password are required to get into the protected area. The account name is always "member", not the actual member name.

To login into the protected area, type the following when prompted: **Name:** "*member* "- **Password:** "*pinfire"*

++

Opal Workshop

The AOS opal workshop is at **Ball Jr. High School** on 1500 W. Ball Road, Anaheim, CA. It will be available for AOS members on Wednesday. Contact **Stan McCall** for details at **(714) 220-9282** if you plan to attend a session.

++

The American Opal Society meets in Quartzsite

By Mike Kowalsky

Barbara Beemer Moritz, Barbara McCondra, & B. Moritz's Sister

Hi All,

It was a planned event that was successful but not without its last minute doubts. I had been in contact with several members of AOS and our representative in Lightning Ridge Australia. We all planned to be in Quartzite on Sunday January 18th and have a short get together. It all hinged around that date because that was the only day that two of us would be able to go to Quartzsite. I was returning from skiing in Mammoth two days before that date, but more importantly, our AOS representative, Barbara Beamer Moritz, would be there after crisscrossing the western U.S. visiting relatives and friends. Her last stop in the U.S. was Palm Springs where her sister resides.

I also had a special mission in the Quartzsite area. I had a special delivery to make to one of our members; Dr. John Hiller who winters near Quartzsite rather than experience the snow and ice in Tennessee. I took on the job of delivering to him and his wife the raffle prize they won at our annual show in November. The prize was a special grouping of items from one of our member –dealers; Wes and Frann Roth. It contained a very nice parcel of rough Australian opal as well as a Len Cram book on Opals and other items for a confirmed opalholic. I really wanted to see Johns face when he received such an excellent prize.

Mike Kowalsky, Darlene & Jim Hilliard, & Barbara McCondra

I also was given two unexpected and wonderful gifts by Barbara Beemer Moritz, also known by her pen name Barb Whyre. It included a prized CD, which contains many photos of Lightning Ridge Black Opal. Edition 1 CD contains photographs of a magnificent selection of Lightning Ridge Black Opals. I believe it will become part of the AOS library. Another item was a beautifully colored magazine containing an excellent article about the black opal in Lightning Ridge. This is written by the Walgett Shire, which contains the opal fields of Lightning Ridge. Thank you for thinking of us here at AOS and for the unmatchable gifts you brought for us.

One other AOS member, Board Member at Large; Barbara McCondra, also came with me from visiting her son and grandchildren in the San Fernando Valley. We all spent time with great conversation on this special meeting that was successful in becoming a real event.

Needless to say, we took several pictures which will be posted on our website. One has all five AOS members with the typical Quartzsite background.

While my short one day trip to Quartzsite was short in time it was long on meeting friends, conversation and gifts. I would not have missed it for the world.

++

A Salute To Opal Cutting

By W. K. Judd, Jr.
Secretary, American Opal Society

This article is from the October 1975 issue of Gems And Minerals Magazine, a now defunct magazine. It is written by the founder of the American Opal Society – The Editor

The most important thing for anyone to do, if he or she wants to cut opal, is to get rid of some of the old false ideas that, "Opal is hard to grind." Actually, it is one of the easiest stones to grind that can be found, and this is not written to try to precondition anyone. If psychology had to be used to try to impress you, then attempts to bring an enjoyable and profitable hobby to you would be impossible.

As the secretary of the American Opal Society, and the originator of that group, I have occasion to read many letters appealing for help in learning how to grind opal. The question is nearly always the same: "I bought a bottle of opal and a machine. Will you please tell me how to grind it?"

The desire of people to learn how to work this material, and to know what to do with it after it is ground, caused me to want to associate with people who knew the things I wanted to know. Hence, the American Opal Society. I read books and asked so many questions that I began to think opal cutting was about as hard to learn as photography.

One source of information was very emphatic in stating that a person had to use a 220 grit grinding wheel, traveling at 1725 r.p.m., with — lots of water running on the wheel. This source failed to give the bond of the silicon carbide, vitrol or soft bond, and didn't state the size of the wheel, 6, 8 or 10 inches.

Another person felt that 180 grit was about right and impressed the reader with the fact that the dressing of the wheel was the most important factor to consider as long as plenty of water is used.

Diamond wheels were just becoming available and it was said to be the best all around grinders.

A bit of information out of Hong Kong, revealed that the Chinese grinders were using sandstone wheels approximately 3 feet in diameter with a coarse grit on one side and a finer grit on the other, water dripping on as required. They used leather on the sides of the wheels for polishing. Power was supplied by foot pedaling.

Some lapidaries used other variations, which included different grits of wet or dry paper on a maple board. The stone was hand rubbed on this improvised tool.

Sanding and prepolish varied from the use of 400 grit prior to polish to figures in the micron numbers like 24,000, etc.

A large number of opal fanciers started the sanding operation with 220 grit and concluded with 600 grit using 400 in-between.

These techniques and the variations of each would cause one to wonder which of them are right and how he should grind his own opal. At first, the thought entered my mind that some of these people might be stretching the truth a little, but when I look at the work produced by whatever method was employed, it became evident that almost anyone could perform the task in the way he desired. Of course some would be better than others.

The most important part of the grinding of an opal, as I see it, is not the kind of equipment used, nor the kind of polish which produces the finish, but *in the person actually doing the work.* You are the controlling agent, and must develop your own unique method of working to be able to accomplish a desirable result. Believe in yourself and your ability; persevere, and success will more than likely follow. Of course it goes without saying that you have to try to improve as you progress.

Each of us have our own way of doing things and I am sometimes called an unorthodox grinder because of the way I do my work. I have several types of machines and enjoy using each. My old stand-by, which is most commonly used, is a combination unit with a small saw on one end. This saw is for rough work and trimming off excess. The blade is .025 inch thick and travels much too slow to do fine cutting or slicing to get to a fire band.

To sum up my methods:

1. I prefer to reduce the speed of the grinder to approximately 500 or 600 r.p.m.
2. I use a soft bond 6-inch wheel which is kept well-dressed, with a diamond dresser.
3. A squirt bottle is used to wet the wheel with water and occasionally the opal build-up on the wheel is removed with a wet sponge. I don't like to work in water.
4. The grinder I prefer to use is 100 grit. Proper pressure and movement against this soft bond wheel does not crack the opal; just enough moisture to cool the stone is all that is required to prevent friction heat of the gem. The stone is almost as hard as the grinding wheel, actually, so the process is slow enough for me to examine the progress. I like to grind big opals, so I don't mind the little extra time it takes spraying the wheel occasionally, etc.
5. From the 100 grit grinder (500-600 r.p.m.), I go to a 400 grit sanding drum at 500-600 r.p.m. The stone is worked with a spinning motion, alternating with an up and down movement of the hands.
6. I then go to a 600 grit sanding drum for prepolish or preparatory to a sanding in the palm of the hand. The stone is moved in all directions.
7. The final polish is done with a Poly Pad synthetic disc, using titanium dioxide. I will qualify this by saying not just any old titanium dioxide will do. There are 64 different grades or grits, so to get the right one, I go to the Halfway Rock Shop on Simms Road, at Oakley, California. They can tell you all about it, but won't disclose the particulars. This polishing powder at the last purchase was $2.00 per pound.
8. In my opinion the success or degree of success you have in the working of opal depends largely upon *the* ability to coordinate *your* actions and properly use the equipment.

When different wheels are used, such as diamond, I speed up the rotation of the equipment and place a wet sponge in contact with the wheel. It is kept in place with a piece of coat hanger wrapped around the sponge and hooked over the edge of the machine. A squirt of water on the sponge occasionally keeps the grinding wheel moist enough to do my work.

I would like to say that when you grind an opal, there will not likely be too many instances when you apply the same pressure, make the same movements or, in general, are able to just run a production line-like system. Basically, you do the same thing, but approach it in a little different manner because of the variations in the stone you are grinding.

If you feel you have problems, go to your neighborhood rock shop and the owners can usually help straighten them out, maybe put you in contact with someone else who is an opal cutter. Joining a club may help.

I saved the fun part last — selecting, orienting and sawing opal. First, I would suggest that you buy the most inexpensive opal you can find (potch — no color), and just practice trying to grind it to get the feel of how it works. You may also grind to "fire bands," made by a green or red Flowmaster pen, just to see how you can do. The stones you grind in this type of practice are not as important as good opal, but save them anyway; most children are happy to-get them. (You are not likely to have greater appreciation than that which comes from your junior observers.)

Now, you are ready to buy some opal for gems you want to cut. Practice will be necessary before you can expect any degree of success.

1. Look for bottles or pieces that are fiery from the edges and be sure the fire goes all around the stone. It might just be a surface flash. Also look for small windows (chips) which will let you look into the material.
2. Flat pieces, ¼ to ¾ inch are better than those that taper from, say ¼ inch to a knife-edge.
3. If the opal is in chunks, you must draw a mental picture of the cuts that could be made to get good workable stones (this requires practice and patience).
4. Some of the bad things to look for are sand spots, cracks, and diagonal lines of color which are insufficient to produce a good stone, but don't overlook the fact that a doublet or triplet might be made from the stone. Cementing a slice with a very colorful band of fire onto

another piece lacking color can make a good stone. I use quick drying clear epoxy to cement the stones together. If you have lots of time, a slower drying cement can be used.

Most opal is formed by nature in seams or cracks and has a coating of natural adherence of the rock — sand or other formation in which it is found — so in some cases you may have to grind away the surface very gingerly so you can see the color beneath the surface. The coated stone is a gamble unless you can see enough color at some point to justify your purchase.

I dress up the stone and clean it, so I can see what I have to work with before any decision is made to grind. Practice will let you almost know what your yield will be in the finished gem. You will develop a knowledge of whether to cut to a pattern, grind a baroque or cut for smaller stones.

When you buy opal there is only one rule of the thumb to use: If you can't see fire or color in the stone, don't buy it unless you need some material to back thin fiery pieces. II you find some way to buy good material without seeing what you want, you can make a fortune telling others how it is done.

Some reputable dealers will supply you with the material you need. Some of them will send it to you, and if you are not satisfied, they will return your money or send another parcel upon request. Your description of what you want will help the dealer to make a selection for you.

Purchasing opal is very much like taking pictures — the selection of the subject for a good picture requires practice and study. You can snap a shot on your camera, you can grind a comparable stone from opal, but to get good results, desire, study, patience, practice, imagination, application, and perseverance is required.

When sawing opal, use a thin blade (.012 inch or thinner). A thick blade will waste material. Use a separate saw for good cuts if you can because it should run at 3000 r.p.m. or faster for long wear and good cutting. Don't be afraid to dress your saw if it is bumpy or out of round. Take an old silicon carbide wheel and just barely touch the saw blade with it at first so it grinds off any unevenness. The blade will outlast two that are bumping and bouncing against the stone you try to cut. If you can use a vise on which to rest your hands while feeding the opal through the saw, it may help to make a straight cut.

I dop an opal on a nail (aluminum, if available). The gem can be easily removed by holding the nail over an alcohol lamp, and twisting the stone to get it off as soon as the wax heats. My advice is to pre-heat opal under a 100-watt lamp before dopping it. The shock of hot wax or laying the stone on a hot piece of metal is a cardinal sin, in my opinion. Avoid sudden changes in temperature which will cause cracking.

I am very thankful that I can grind a stone, cast a mounting or write a line because my arms have been dislocated, muscles torn in two and disabilities suffered which cause me to work much harder than you might have to. So I will conclude by saying that if I can grind an opal, I know *you* can.

Remember the old saying? If the world gives you a lemon, make lemonade.

Want to find out more about opal? The place to learn is the 8th Annual Opal Show, presented by. the American Opal Society, October 11 and 12 at the Norwalk Civic Center, 12700 Norwalk Boulevard, Norwalk, California. There will be displays of many varieties of this beautiful gem, demonstrations and dealer sales.

In conjunction with the show, the 2nd Annual Opal Seminar will be held. At this two-day session, experienced opal cutters, gemologists, dealers and university professors will present lectures and demonstrations. Subjects to be covered include selecting good rough material, color in opal, identification, jewelry design, stone setting, mining, making doublets and triplets, synthetics, equipment and appraising finished opal. The donation of $25.00 per person covers both days at the seminar plus admission to the show.

Attendance at the seminar is limited, so getting in your reservation as soon as possible is advisable. Checks should be sent to Bill Whittle, Seminar Chairman, American Opal Society, P.O. Box 3895, Downey, California 90242.

NOTE: The above information, of course is outdated by about 30 years! Please do not use the address either! – The Editor

++

"Rainbow Calsilica" or: Gemmology meets Art

A New Artificially Reconstructed Ornamental Material

At the 2002 Mineral Show in Ste. Marie aux Mines in France, a beautifully coloured necklace consisting of banded opaque stones was offered for sale. The SSEF purchased two loose stones of this material weighing 46.11 ct and 36.14 ct. The gemstone merchant explained that the stones came from the USA and had been around for several years. He showed a photo of the mine as well as a certificate of authenticity from a US based geological laboratory, identifying this material as being natural.

The distributor in the USA specified that it is believed to come from the Chihuahua area, Mexico. The analysing geologist stated that the material can be described as "vein matter" or

So-called "rainbow calsilica", showing multicoloured banding

fracture filling due to a "copper push" which cuts a volcanic rock. The material itself was described as a microcrystalline calcite bonded with the amorphous clay mineral allophane. The geologist concluded that there had been "no evidence found that the hand of a man has been involved in the formation". Since opaque materials, especially when they appear to made of several minerals, are relatively difficult to analyse with standard gemmological means, we decided to perform a Raman spectroscopic study on the two pieces. And as we have experienced many times in the past, our Raman spectrometer once again proved to be of invaluable help.

In the microscope, we could distinguish differently coloured layers of material (blue, several shades of green, reddish brown, white, black) containing differently coloured small grains, all interspersed with larger partly idiomorphic white grains of various sizes. Around the larger grains and in between the layers a soft transparent material, sometimes with bubbles, was observed. With the Raman spectrometer, the white grains were identified

as calcite. When we analysed the coloured grains, we noticed that the Raman spectra did not fit with any of the copper minerals we had in our library, but rather resembled the Raman spectra of artificial colours as observed in dyed coral. We then contacted a scientist who is analysing pigments in paintings (Dr. Peter Vandenabeele, University of Ghent in Belgium), and soon got the result: The Raman spectra of the dark blue grains compare well with the Raman spectrum of 20th century blue artist's pigments. The material could be identified as the copper phtalocyanine pigment PB15, a synthetic pigment which was developed in the 1930's. Similarly, the light greenish yellow areas contained the yellow mono-azo pigment PY1 (Hansa Yellow).

The soft plastic-like material turned out to be highly related to paraffin wax. From its appearance and spectrum, it is likely that the substance is an aliphatic polymer or a paraffin wax derivate mixed with other compounds unknown to us.

Besides calcite and these clearly man-made components, we also identified hematite in the red bands as colour-giving compound, and celestine in areas and layers which appeared black to the naked eye. Under 50x magnification the black areas turned out to be dark greyish green, with a multitude of different grains, transparent polymer-like layers and dyes.

The identification of pigments with Raman spectrometry is new in gemmology, but has been performed extensively for the identification of artists' pigments. Raman spectrometry has been applied for the identification of pigments in mediaeval manuscripts, polychrome sculptures, wall paintings and easel paintings, dating from antiquity until the 20th century. Now, through interdisciplinary collaboration, we could prove that the "rainbow calsilica" is not a natural material.

From the SSEF Facette No 10, January 2003

++

Ask Rocky – Opal in Water

I've been buying some opal at rock shows recently and they are always sold in glass containers with some sort of liquid. Once I get them home I usually take them out and spread them out so that I can see them better. Should I be storing them in liquid? Thanks Rocky, your great...

ANSWER: Well thank you for asking. As for storing wet or dry, I think it is best dry. I sometimes keep my rough wet in glass domes just to simplify selection of new stones to cut. Once the stones are dried - keep them dry. All my cut stones are also kept dry.

Some dry opals crack and craze. But the bottom line is that they will anyway, eventually. Some opals are born to craze. Experts simply don't agree on the causes of opal stability and instability, but here's what I've come to think over the years based on reading, conversations with experts and my own experience. All opal contains varying amounts of water. Australian opal expert Len Cram's research indicates that good quality, stable Aussie material has about 6% water. Years ago when I was digging for opal at Keith Hodson's Virgin Valley mine in Nevada, Keith told me a couple of stories that make me believe opal instability is caused by mining it several hundred thousand years too soon!

Most Virgin Valley opal simply contains too much water when mined, opal missed in mining and found several years later in the mine-dumps outside, tended to have a much higher percentage of stability. This was presumably due to slower dehydration of excess water, allowing internal "adjustment" to the water loss. While most Australian opal is stable, I've been told that production from new mines is viewed with great caution until proven.

Over the years I've developed the habit of putting all the opals I cut aside for at least 6 months before mounting or selling them. Most problems -- if there are to be any - show up in that amount of time.

From Rockhound Rumblings -10/01 via The Rock Collector 9/02.

++

Is It Amber or Is It Fake?

by Richard Busch (FGMS Member)

[Ed. Note: This article won first place in the adult technical-advanced article competition in the California Federation of Mineralogical Societies in 1994.]

In an article which appeared on the front page of the July 7, 1993, issue of *The Wall Street Journal,* Warren Getler described the piece of amber he bought for $800: "The eyes of the entombed lizard glared defiantly as I marvelled at the critter's near-perfect state of preservation, its features frozen in time for 30 million years in a sneaker-sized chunk of glossy amber. I loved that lizard. It was a paleontological beauty, the kind of piece amateur fossil collectors like me dream of owning."

Mr. Getler went on to describe the results of an analysis of his piece of amber that was performed at the American Museum of Natural History. In addition to the lizard, the amber contained an anachronism -- two strands of human hair. The specimen was significantly less than 30 million years old. The lizard, it was determined, was a modern Caribbean tree climber known as an anole. The final insult: The "amber" was revealed to be made of nothing more than the unsaturated polyester used to repair fiberglass speedboats.

Getler purchased his speedboat resin, as amber, from a New York gem and mineral dealer. Did the dealer know the "amber" was a fake? Perhaps. Perhaps not. Amber fakes continue to get better while the demand for amber continues to increase. As a result of this fall's release of *Jurassic Park* on videotape, the demand for amber is expected to skyrocket -- along with the availability of fakes. Mr. Getler quotes Francis Huber, Curator of Paleobotany at the Smithsonian Institution: "A good 80% of the stuff brought to me is fake."

So, with a significant amount of phony amber in the marketplace, how is a potential purchaser able to answer the question: Is it amber or is it fake? In general, no single test is absolutely conclusive. However, the results of several tests, taken together, can tell you whether the specimen you cherish was made 25 or more million years ago by the forces of nature, or last week by an unscrupulous person in their garage.

Specific Gravity: Dissolve two tablespoons of table salt in eight ounces of water. Remove the "amber" from any mountings and drop it into the solution. If it sinks, it is *not* amber. If it floats, it *may* be amber.

Hardness: Try scratching the "amber" with your fingernail. Real amber has a hardness of approximately 2.5 on the Moh's scale. If you can scratch the specimen with your fingernail, it is *not* amber. If you are unable to scratch it with your fingernail, it *may* be amber.

Static Electricity: Place some small pieces of tissue on a flat surface. Rub the "amber" vigorously against a piece of velvet until it is warm and hold it about one-half inch above the tissue pieces. If the pieces of tissue are not attracted to the specimen, it is *not* amber. If tissue is attracted to the specimen, it *may* be amber.

Fluorescence: Place the specimen under a short-wave ultraviolet light. If the specimen does not fluoresce or if it fluoresces other than a very pale blue, it is *not* amber. If the specimen fluoresces a pale blue under short-wave ultraviolet light, it *may* be amber.

Smell: Rub the specimen briskly on a piece of cloth until it gets warm, then smell it. If the specimen emits a plastic or chemical

smell, it is *not* amber. If it emits a mild pine or turpentine odor, it *may* be amber. Look out for the possibility that the specimen might be copal, which we will discuss later.

Refractive Index: Drop the specimen into a glass of mineral oil, such as Johnson's Baby Oil. The oil has a refractive index very close to that of amber -- 1.54. If the edges of the specimen are easily distinguished from the oil by either a dark outline or light halo, the specimen is *not* amber. If it is difficult to discern the edges of the specimen, it *may* be amber. Note: This test may be difficult to perform if the amber is exceptionally dark. Try to disregard the color difference between the specimen and the oil.

Taste: Wash the specimen in mild soapy water, rinse it thoroughly, then taste the specimen. If you detect anything other than the mildest taste, especially if you notice any strong, unpleasant, or chemical taste, the specimen is *not* amber. If the specimen has no taste (or one that is very subtle) it *may* be amber.

Entomology or Paleontology: If the "amber" contains an insect or other animal, try to have it identified. Most insects and animals found in real amber are extinct. If the animal is not extinct, or if it does not match those found in amber documented from the same location, the specimen is very likely *not* amber. If the animal is extinct and matches an animal found in amber from the same location, the specimen *may* be amber. Beware! There have been instances in which an insect has been manually inserted into a piece of real amber.

There are several additional tests which are (or may be) destructive to the specimen. Not everyone may let you perform these tests on a piece of "amber" that you are considering purchasing. However, if you have a specimen of questionable pedigree in your collection, you might consider the following tests:

Hot Needle: Heat a needle until the tip is red hot, then place the point into the specimen. If the needle goes in easily, or if a bad smell is emitted, or if the needle leaves a black mark on the specimen, it is *not* amber. If the needle enters the specimen slowly and the specimen emits a pine or turpentine smell, it *may* be amber.

Solubility: Place a drop of acetone, ether, or 95% ethyl alcohol on the specimen. If the area dissolves or if the surface becomes tacky, the specimen is *not* amber. If the surface remains intact, it *may* be amber.

Melting Point: If you have an oven or other heating apparatus with an accurate temperature indicator, place the specimen in the oven and heat it. Increase the temperature slowly over time to determine its melting point. If the specimen melts below 390 degrees Fahrenheit, it is *not* amber. If its melting point is in excess of 715 degrees Fahrenheit, it is also *not* amber. If the specimen melts between the temperatures of 390 and 715 degrees Fahrenheit, it *may* be amber.

If you encounter a specimen that looks like amber and passes some, but not all, of the tests mentioned above, you might be dealing with a specimen of **copal**. Copal is best described as "young" amber. Copal, like amber, is formed from the resin of trees. However, unlike amber, copal is only one-hundred to three-million years old. Copal from Kenya and Colombia is frequently marketed as "amber."

There are several tests that can be performed to distinguish copal from true amber. Copal is softer than amber; it has a hardness of about 1.5 versus amber's 2.5 on the Moh's scale. Thus, copal can be scratched with a fingernail. Copal is generally brittle and sensitive to heat or sunlight. It is difficult to cut and polish, and will develop a crazed surface in a few years. Copal has a much lower melting point than amber, about 300 degrees Fahrenheit, and is soluble in acetone. When subjected to short-wave ultraviolet light, copal does not fluoresce. Additionally, the insects in copal are recent -- those in amber are generally extinct.

When trying to distinguish real amber from a fake, many collectors frequently overlook perhaps the most important indicator of all . . .

Common Sense: Mr. Getler should have known better. If his 30 million year old lizard in amber were authentic, it should have carried a price between $10,000 and $40,000, depending upon its condition. In his article, Getler mentioned that he thought he had gotten it "for a steal." Well, there **was** a steal involved. Unfortunately, Mr. Getler was on the losing end. It has been said: If it seems too good to be true, then it generally **is** too good to be true. This homily applies especially to amber dealings. Even if the situation seems reasonable, the specimen still might be a fake. It is wise to be skeptical these days when purchasing amber. The best bet is to insist upon a return privilege from the seller.

Despite your best efforts, you still could wind up purchasing a fake. If that happens, rest assured you are in good company. Recently, the British Natural History Museum discovered that what it believed to be the oldest specimen of a particular species of bee in amber was, in reality, a fake. The specimen was made of genuine amber. However, someone had drilled a hole, inserted the bee, and refilled the specimen with melted amber. The specimen was actually less than 150 years old.

References:

Baalke, Ron (baalke@kelvin.jpl.nasa.gov); Internet postings; May 1994.
Fisher, Pat (fisher@utkvx.utcc.utk.edu); Internet posting; May 1994.
Getler, Warren;
"From This Amber, You Could Clone A Really Cheap Suit;" *The Wall Street Journal;* Dow Jones & Company; July 7, 1993.
Grogan, William (wlgrogan@sae.ssu.umd); Internet posting; May 1994.
Platt, Garry (garry@gplatt.demon.co.uk); Internet posting; May 1994.
Wetz, Warren (warrenwetz@delphi.com); Internet posting; May 1994.

++

The Search for Shooting Stars: Hunting for Meteorites on the Antarctic Plateau

By Rick Hudson

Meteorites are samples from parts of the Solar System astronauts may never be able to visit, or that would cost a great deal to explore. They have been dubbed 'the poor man's space probe'. – 'Meteorites' by Robert Hutchison and Andrew Graham, Sterling Publishing, NY.

The wind is gusting at 40 knots from the northwest, the air temperature is a bracing -20 centigrade, the sky is clear and sunny. In a land devoid of shape, or form, or colour, there is nothing to see in any direction. Antarctica is truly the last place on Earth: remote, aloof, yielding its secrets only after the most backbreaking effort.

Yet today this great continent is witnessing a remarkable race, ever since a Japanese scientist picked up 9 rocks from the ice's surface near the Yamato Mountains in 1969. Months later, startled researchers realized what he had found - a collection of rare meteorites.

In 1975, a Japanese team visited the same area again, and this time returned at the end of the summer program with a staggering 663 samples! The international race was on, to collect, classify and store these important finds. The USA quickly formed the Antarctic Search for Meteorites group (ANSMET). During the following 20 years, over 17,000 meteorites have been found, tripling the known number available to science.

The Source

What's happening here? To understand the process, we need to go back in time, a long way back. Asteroids are the building blocks of our early solar system, orbiting the sun between Mars and Jupiter. A fragment, or meteoroid, occasionally escapes the asteroid belt, and wanders into an Earth orbit. Some time later, these fragments of space flotsam enter our atmosphere as meteorites or "shooting stars". If observed and measured upon entry, they are called falls; if discovered later, they are finds. Most are finds. After a particularly famous fireball was photographed (by accident) in 1959, both Canada and the USA established a Camera Network to scan the skies and record trajectories. Only when a meteorite's trajectory is precisely known can its origin be calculated. To date, each country has successfully photographed only a single meteorite. In both cases, the source was found to be the asteroid belt.

The largest meteorite found to date is the 65-ton Hoba meteorite in Namibia, southwest Africa (which may have been as large as 120 tons before weathering), but many are tiny by comparison. Small or large, together they form a rain of dust, which results in an amazing 10,000-30,000 tons of debris raining down on us every year. (Time to wear a hard hat, when leaving the house!) While most fall into the ocean (the oceans cover 72% of the Earth), others come down on mountains, deserts and forests, where the chances of recovery are slim indeed. The Canadian Camera Network estimates over 26,000 fragments over 100 grams (about 3.5 oz) arrive each year. Since the late 1970s, specially equipped NASA aircraft have been flying at over 60,000 feet, where sticky panels on the wings trap micrometeorites and other space dust for subsequent analysis.

Why Antarctica?

Why, then, are so many meteorites being found in Antarctica? No more are falling there than elsewhere. In fact, quite the opposite. Most meteors, comets and asteroids orbit in the same plane as the planets, and rotate about the sun in the same direction as the planets. As a result, they tend to converge with the Earth, rather than slamming headfirst into us on diametrically opposing paths. Further, the focusing effect of the Earth's gravitational field tends to draw more meteorites in towards the equatorial regions, with the result that there is a slight preference for falls to occur away from the polar regions.

But Antarctica is unique because it is encased in glacial ice. This frozen ocean moves steadily outwards toward the coast, carrying with it anything that has been deposited on it. Remember, of course, that meteorites, being more dense than ice, will slowly sink into the glaciers. But as these rivers of ice approach the coast mountains, they start to be thrust upwards by the underlying slopes. The ice begins to sublimate (change from a solid to a gas state, without going through a liquid phase), aided by fierce katabatic winds that roll down off the high ground (over 2000 m on the polar plateau). This process scours the ice away at a rate of about 5 cm per year, and slowly, gently, the meteorites are exposed. These zones are known as 'stranding surfaces'.

Such a process serves to concentrate the deposits. By plotting the positions of the meteorites when found, and determining the age of the associated ice, scientists can calculate how long a stone has been buried, and hence when it entered our atmosphere.

A further plus to this deep-freeze process is that the meteorites are kept, quite literally, in cold storage, so they are often in excellent condition when found, with almost no corrosion, oxidation or physical damage done to them after their arrival. The same cannot be said, obviously, for material coming down in deserts or jungles.

The Search

How do scientists find them? Each year, small, mobile groups are dropped off in areas, which have been determined to be good sites. Remember, they are looking for zones where there is bare ice, just upstream of mountains or nunataks, which force the sea-bound glaciers to rise and dissolve. The team usually searches in a grid pattern, on snowmobiles, often just 25 metres apart. Every rock on the surface must be examined, and a trained eye quickly tells whether the object is a shooting star or of local origin.

When a meteor is found, its exact position is noted using a Global Positioning System (satellite positioning). It is photographed, and placed in a specially decontaminated bag, for analysis later. Because of this low pollution process, some important discoveries have been made. In 1980 the ANSMET team returned from the Elephant Moraine area near McMurdo Base with what turned out to be a very exciting sample. EETA79001 was an achondrite (stony meteorite) with abundant melted rock on its exterior. Inside, chemists later discovered traces of noble gases that were identical to those measured by the Viking Lander in the Martian atmosphere.

Another meteorite, found in a crevassed glacier field while scientists were taking a break from meteorite hunting, turned out some years later when it was thawed (all samples are kept

frozen back at the Johnson Space Center in Houston, TX) to contain feldspar glass and oxygen isotopes which confirmed its Martian origin. More importantly, there appeared to be extremely tiny structures resembling bacteria. Who knows? The debate will continue for years, but there are exciting possibilities ahead.

How many meteorites are found these days? Typically, a group can work in the field for about 7 weeks during the so-called 'summer' (Dec/Jan). Bad weather (high winds or low cloud) will take up as much as 10 days of that precious time. A team tries to cover about 150 square kilometers per season. A typical season yields 100-200 finds; the best single day was close to 40.

Studying Them

The study of meteorites is called meteoritics, and there are three broad types: stony, stony-iron, and iron. The former are the most common, and are divided into chondrites and achondrites. While meteorites heat up tremendously as they enter the Earth's atmosphere, their cores remain supercooled to near absolute zero, so only a narrow 1-2 mm surface usually melts, often forming a fusion crust of black glass. Other common features are the surface dimples, pits and flow features.

By studying these specimens, that have been 'on ice' both in space and the Antarctic plateau, we are able to see back in time to view primitive matter from early solar nebulae, or from a pre-planetary era, or more recently from our own solar system. To find meteorites, therefore, is to travel back in Einsteinian time to our very distant past and in so doing, gain a glimpse, however fuzzy, of our future.

E-mail: mineral@islandnet.com

From The Canadian Rockhound Internet Magazine – http://www.canadianrockhound.com Summer 1998: Volume 2, Number 1

++

Cutting Obsidian

Rainbow Sheen: Saw with the bands, as if they were a stack of plates and you wish to un-stack them. Watch for "fire spots" of gold sheen. It is not plentiful, but opal-like colors do occur, also.

Rainbow: Cut parallel to the flow layers. These can be seen by looking at fractures surfaces using a single lamp directly overhead. Note: The bands are not always straight. It may be necessary to turn the stone slightly between cuts. Examine each slab set with either water or saw oil to see if the correct angle has been obtained.

Iridescent: In cutting the two types of iridescent obsidian, orientation is important. One type is banded and the color lies in the bands. On the other type, the surface has to be chipped to find the color in the conchoidal fracture surface. Cut the banded material parallel to the bands. To get the rainbow effect, cut the stone at about 15 degrees across the bands.

Midnight Lace: Lace-pattern obsidian should be cut across the surface pattern that you want to reproduce. Sand out all the scratches with grit and wet sanding (to reduce heat) before going on to polish. For the final polish use a hard felt wheel with cerium oxide. *Via the Tumbler 11/95, via the Obsidian Observer, 2-01.*

++

February Gem & Mineral Shows

31-14–TUCSON, AZ: Show; Martin Zinn Expositions; The Vagabond Plaza Hotel, 1601 N. Oracle Rd.; Sun. 10-7, Mon. 10-7, Tue. 10-7, Wed. 10-7, Thu. 10-7, Fri. 10-7, Sat. 10-7, Sun. 10-5; free admission; contact Martin Zinn Expositions, P.O. Box 999, Evergreen, CO 80437-0999, e-mail: MZ0955@aol.com; Web site: www.mzexpos.com.

31-14–TUCSON, AZ: Annual show; Martin Zinn Expositions; The Executive Inn Hotel, 333 W. Drachman; 10-7 daily; free admission; more than 400 dealers from all over the world; contact Martin Zinn Expositions, P.O. Box 999, Evergreen, CO 80437, (303) 674-2713; e-mail: MZ0955@aol.com; Web site: www.mzexpos.com.

31-14–TUCSON, AZ: Annual show; Martin Zinn Expositions; The InnSuites Hotel, 475 N. Granada; 10-7 daily; free admission; more than 400 dealers from all over the world; contact Martin Zinn Expositions, P.O. Box 999, Evergreen, CO 80437, (303) 674-2713; e-mail: MZ0955@aol.com; Web site: www.mzexpos.com.

31-14–TUCSON, AZ: Annual show; Martin Zinn Expositions; The Mineral & Fossil Marketplace, 1333 N. Oracle Rd.; 10-7 daily; free admission; more than 400 dealers from all over the world; contact Martin Zinn Expositions, P.O. Box 999, Evergreen, CO 80437, (303) 674-2713; e-mail: MZ0955@aol.com; Web site: www.mzexpos.com.

31-14–TUCSON, AZ: Show; AKS Gem Shows; Howard Johnson, 1010 S. Freeway; 10-7 daily; contact Kay Schabilion, P.O. Box 24552, New Orleans, LA 70184, (504) 455-6101, fax (504) 455-6157; Web site: www.aksshow.com.

31-14–TUCSON, AZ: Show; AKS Gem Shows; La Quinta (formerly Holiday Inn Express), 750 W. Starr Pass Blvd.; 10-7 daily; contact Kay Schabilion, P.O. Box 24552, New Orleans, LA 70184, (504) 455-6101, fax (504) 455-6157; Web site: www.aksshow.com.

2-8--TUCSON, AZ: Retail and wholesale show, "Bead Renaissance Show"; J&J Promotions; Sabbar Shrine, 450 S. Tucson Blvd.; Mon. 4-8, Tue. 10-6, Wed. 10-6, Thu. 10-6, Fri. 10-6, Sat. 10-6, Sun. 10-6; free admission; contact Glen or Joan Johnson, J&J Promotions, P.O. Box 420, Williamsburg, NM 87942, (505) 894-1293; e-mail:info@beadshow.com; Web site: www.beadshow.com.

13-22–INDIO, CA: Show; San Gorgonio Mineral & Gem Society; Fairgrounds, 46-350 Arabia St.; 10-10 each day; contact Bert Grisham, (909) 849-1674.

21-22–APACHE JUNCTION, AZ: Show, "2004--Rocks Galore"; Apache Junction Rock & Gem Club; Apache Junction High School, Ironwood and Southern; Sat. 10-5, Sun. 10-4; adults $2.50, students $1, children under 12 free; contact Raymond Quillia, 3710 S Goldfield #944, Apache Junction, AZ 85219, (480) 671-2944.

21-22–STOCKTON, CA: Show, "Earth's Treasures"; Stockton Lapidary & Mineral Club; San Joaquin Co. Fairgrounds,1658 S Airport Way, Bldg.4; Sat. 10-5, Sun 10-4; contact Jim Dunlap, (209) 478-0747, or Beverly Miller, (209) 334-3438; e-mail: crystalpoint@aol.com.

27-29–PALM SPRINGS, CA: Show, "Palm Springs Rockfest and Earth Science Fair"; Specialty Productions Development; Palm Springs Market Fair, Ramon Road exit off I-10; Fri. 9-5, Sat. 9-5, Sun. 9-5; over 13 $6, ages 7 to 12 $3, under 7 free; contact W.R. Russ, 4515 E. Joan de Arc, Phoenix, AZ 85032, (602) 929-7802 or (602) 684-7381.