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

Volume #37 Issue #1
January 2004

Some Topics In This Issue:

- Sedimentary Rock-Hosted Opal
- Blackening Andamooka Matrix Opal
- A Beetle Which Thinks It's An Opal
- Triplet Tips and Tricks
- The "Art" Of Finding Opal
- Quartzsite Shows

Important Dates:

Board Meeting
January 5th

General Meeting
January 8th

Speaker: Stan McCall
Opal Inlay &
Making Spencer Opal Triplets

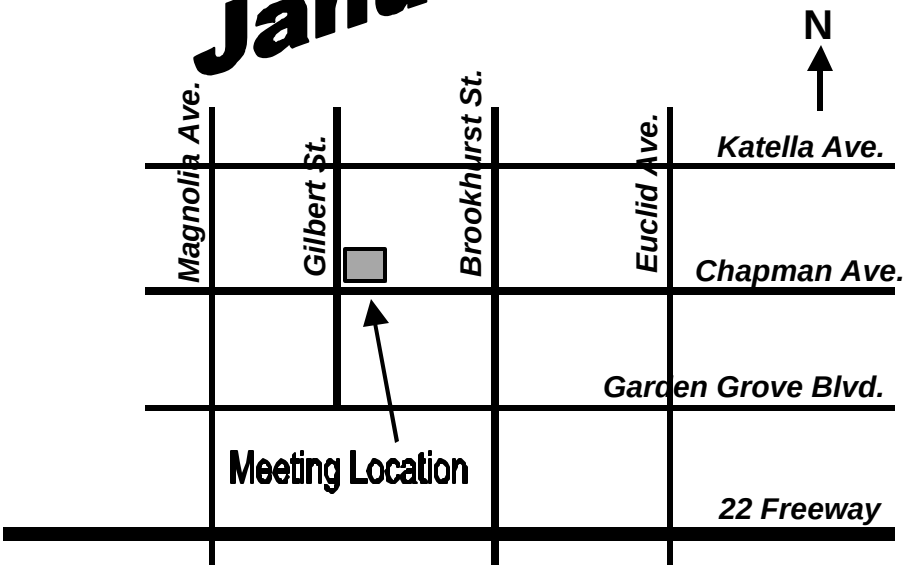
— GENERAL MEETINGS —

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*

TO:

General Meeting January 8th



The American Opal Society

http://opalsociety.org

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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.

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

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Please address all inquiries and exchange newsletters to:

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

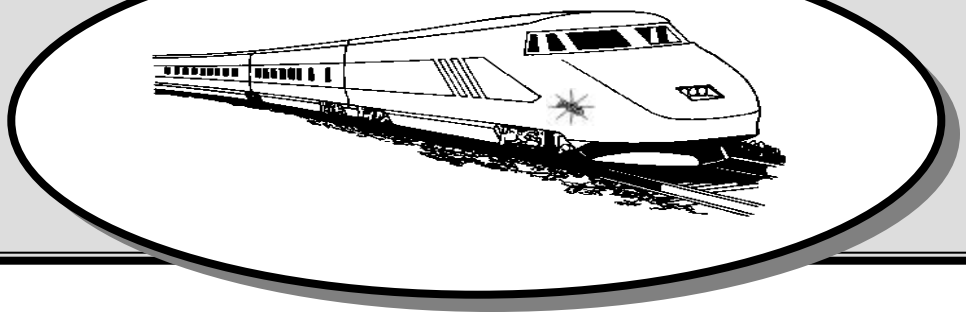
Are Your Dues Due Now?

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



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President's Message

By Pete Goetz

Hi Folks,

2004 is upon us, 2003 was somewhat productive. 2004, however, should be a banner year for the AOS. We have a lot of exciting "changes" on the planning board, and we are just waiting to launch them.

The AOS Christmas Dinner was a great time. Food was good; the company was good, the place good, and the after dinner talk was outstanding. David Burton of Burton Gems gave a travel log about mining at various places in Australia. What I thought was interesting was not only did Dave have a lot of mining knowledge, but it seems he took the time an had the interest in a lot of the local stuff and his the of "things" which added a great deal of color and humor to his presentation. We hop to hear from him again at a regular meeting.

Not a lot to say at the moment. A lot of things are on the drawing board – stay tuned!

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January Speaker – Stan McCall

Stan will give a slide show presentation on **Opal Inlay**. After that, Stan will lecture on making **Spencer opal triplets**. The triplet lecture will be a **"hands on"** demonstration.

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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 in December. An account name and password are required to get into the protected area.

To login into the protected area, click the following when prompted: **Name:** member - **Password:** yowahnut

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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.

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Sedimentary Rock-Hosted Opal

(BC Mineral Deposit Profile #Q08)

by S. Paradis [1], J. Townsend[2] and G. J. Simandl[3]

[1] Geological Survey of Canada, Pacific Geoscience Centre, Sidney, British Columbia, Canada
[2] South Australia Department of Mines and Energy
[3] B.C. Geological Survey, Victoria, British Columbia, Canada

Paradis, S., Townsend, J. and Simandl, G.J. (1999): Sedimentary Rock-hosted Opal; in Selected British Columbia Mineral Deposit Profiles, Volume 3, Industrial Minerals, G.J. Simandl, Z.D. Hora and D.V. Lefebure, Editors, British Columbia Ministry of Energy and Mines.

IDENTIFICATION

SYNONYMS: Australian opal deposits.
COMMODITY: Gem quality opal (precious and common).
EXAMPLES (British Columbia - *Canadian/International*): *Lightning Ridge and White Cliffs (New South Wales, Australia), Mintabie, Coober Pedy, Lambina and Andamooka (South Australia) Yowah, New Angledool (Queensland, Australia).*

GEOLOGICAL CHARACTERISTICS

CAPSULE DESCRIPTION: Most of the Australian opal occurs in cracks, partings, along bedding planes, pore spaces and other cavities in strongly weathered sandstones generally underlain by a subhorizontal barrier of reduced permeability. The barriers consist mainly of claystones, siltstones and ironstone strata.
TECTONIC SETTINGS: The tectonic setting at the time of deposition and lithification of the opal-bearing lithologies is not indicative of favourable environment for opal. However, the presence of a terrestrial (non-marine) environment at the time of intense weathering is essential.
DEPOSITIONAL ENVIRONMENT / GEOLOGICAL SETTING: Clastic sediments were deposited in the shallow inland basins. Subsequently, these areas were affected by climatic/paleo-climatic changes (transformation into desert environment) that have resulted in rapid fluctuation in water table levels and entrapment of silica-rich waters.
AGE OF MINERALIZATION: In Queensland, Australia the host rocks are Cretaceous or Paleozoic and have been affected by deep weathering during the Early Eocene and Late Oligocene. The latter period is believed by some to be related to opal precipitation. Similar conditions favourable for opal deposition could have prevailed in different time periods in other parts of the world.
HOST/ASSOCIATED ROCKS: Sandstones, conglomerate, claystone and silty claystone. Associated lithologies are feldspathic rocks weathered to kaolinite, silcrete and siliceous duricrust, shales and shaley mudstones, limestones, dolostones and ironstones. Exceptionally, precious opal may be found in weathered crystalline basements stratigraphically underlying the lithologies described above.
DEPOSIT FORM: Opal occurrences are stratabound. Favorable subhorizontal, precious opal-bearing intervals can exceed 10 m in thickness, and are known to persist for distances of one to over 100 km. The distribution of individual precious opal occurrences within favorable areas is erratic. Veins are subhorizontal to subvertical and locally up to 10 cm thick. They pinch and swell, branch or terminate abruptly. A single vein can contain chalky to bony to blue, gray or milky common opal and precious opal.
TEXTURE/STRUCTURE: Opal occurs as veinlets, thin seams in vertical and horizontal joints, desiccation cracks in ironstone layers, lenses and concretions, and replacing fossils (shell and skeletal) and wood fragments. Opal also forms pseudomorphs after glauberite[4]. In places opal seems to follow cross bedding. In unusual cases opal pieces eroded from the original host are incorporated into younger sediments. In silicified sandstones precious opal may form the cement around detrital quartz grains, in other areas, the opal may be cut by gypsum or alunite-filled fractures. The lithologies above the opal may contain characteristic red-brown, gypsiferous silt-filled tubules.

[4] Glauberite: $4[Na_2\,Ca(SO_4)_2]$, widespread as a saline deposit formed as a precipitate in salt lake environments, also occurs under arid conditions as isolated crystals embedded in clastic sediments.

ORE MINERALOGY: Precious opal.
GANGUE MINERALOGY [Principal and *subordinate*]: Host rock, common opal, gypsum and gypsum-shot opal, alunite, hematite, limonite/goethite.
ALTERATION MINERALOGY: N/A.
WEATHERING: Feldspathic rocks strongly altered to kaolinite typically overly the Australian precious opal-bearing deposits. Opal exposed to arid weathering environments may desiccate, crack and lose its value; however, gem quality opal may be found at depth.
ORE CONTROLS: 1) Regional configuration of impermeable layers permitting groundwater pooling. 2) Local traps within regional sedimentary structure, such as bedding irregularities, floored by impermeable layers, porous material (e.g. fossils) or voids where opal can precipitate.
GENETIC MODELS: Australian opal is hosted mainly by strongly weathered sandstones, which are underlain by claystone, siltstone and ironstone that form relatively impermeable barriers. Periods of intense weathering are evidenced by indurated crust horizons. Silica-transporting solutions derived from intense weathering of feldspar within sandstones percolated downward to the contact between the porous sandstone and the underlying impermeable layers. During a subsequent dehydration (dry) period silica was progressively concentrated by evaporation. The last, most concentrated solutions or colloidal suspensions were retained within bedding irregularities at the permeable/impermeable rock interface, in joints and in other traps. Gem-quality opal was formed by ordered settling and hardening of silica microspheres of uniform dimensions. Disordered arrangement of silica microspheres or variability in microsphere size results in formation of common opal.
ASSOCIATED DEPOSIT TYPES: Possibly clay deposits (B05).
COMMENTS: There is good reason to believe that a similar mode of opal formation could also take place in porous terrestrial

and waterlain pyroclastic rocks, assuming favorable geological and paleo-climatic setting.

EXPLORATION GUIDES

GEOCHEMICAL SIGNATURE: N/A

GEOPHYSICAL SIGNATURE: Most opal fluoresces brightly if exposed to ultraviolet light. Limited success was achieved using magnetic field and resistivity to find ironstone and ironstone concretions that commonly contain precious opal in Queensland.

OTHER EXPLORATION GUIDES: Unmetamorphosed or weakly metamorphosed areas known for:

1) prolonged periods of deep chemical paleoweathering characterized by rock saturation and dehydration cycles;
2) broad sedimentary structures permitting shallow underground solution pooling;
3) local traps where opal could precipitate from nearly static, silica-bearing ground waters; and
4) presence of common opal.

ECONOMIC FACTORS

TYPICAL GRADE AND TONNAGE: No reliable estimates of grade or tonnage are available for individual deposits. Until 1970 the only records of production were annual returns submitted by opal buyers. Miners fear that reporting the true production would be used for taxation purposes. As with other gemstones, reporting the grades in terms of grams or carats per tonne may be strongly misleading. Large and exceptional quality stones command very high prices. Precious opal may be transparent, white, milky-blue, yellow or black. It is characterized by the internal play of colors, typically red, orange, green or blue. The best opal from Lightning Ridge was worth as much as $Aus. 10 000.00 per carat in cut form and Mintabie opal varied from $Aus. 50.00 to 10 000.00 per ounce of rough. Most of the white to milky colored opal from Coober Pedy was worth $Aus. 10.00 to 100.00 per ounce of rough, but the prices of top quality precious black and crystal opals exceeded $Aus. 5 000.00 per ounce. The value-added aspect of the gem industry is fundamental. An opal miner receives 1 to 50% of the value of cut and polished stone.

ECONOMIC LIMITATIONS: In Australia mining is largely mechanized, either underground or on surface. Opal-bearing seams are generally found at shallow depths (< 30 metres). Opal is still recovered from old tailings by hand sorting over conveyer belts using ultraviolet light. Large and exceptional quality stones command very high prices and the unexpected recovery of such stones may change an operation from losing money to highly profitable. Stones from these deposits are believed to have better stability under atmospheric conditions than opal from most volcanic-hosted deposits.

END USES: A highly priced gemstone that is commonly cut into solid hemispherical or *en cabochon* shapes. Doublets are produced where the precious opal is too thin, needs reinforcement or enhancement; plastic cement, a slice of common opal or other support is added to the back of the opal.

IMPORTANCE: Australian sedimentary-hosted opal deposits account for most of the opal produced today. The situation is likely to continue since these deposits recently attracted important Japanese investment. In 1990, the Coober Pedy, Andamooka and Mintabie produced opal worth over $Aus. 47 million. Total production estimates for Australia are in the order of $Aus. 100 million annually.

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From the Mineral Deposit Profiles of the British Columbia Geological Survey. (http://www.em.gov.bc.ca/Mining/Geolsurv/default.htm)
Reprinted with written permission from the Province of British Columbia's Ministry of Energy and Mines. December 9, 1998

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Is There A Safe Way To Blacken Andamooka Matrix Opal?

This question was asked on the AOS Opal Forum and answered by Barbara McCondra, long-time AOS member, opal miner, and dealer. - Editor

I am reading Emory Ligett's book OPAL BUYER AND DEALER HANDBOOK and Emory discusses a non-acid method of carbonizing on page 23. He gives credit to his friend Carl Barney. The jist is that he puts sugar in a mason jar and the jar in a crock pot in hot water. The lid goes on jar AFTER cooking is completed and this creates a vacuum to suck in the sugar mixture. When cooled off he opens jar taking out the matrix and, without wiping, he bakes it in a regular kitchen oven in ever increasing temperature cycles. For more details , Emory's book is sold by his company Tops in Opals 1851 W. Ehringhaus St. PMB 121 Elizabeth City, NC 27909-4555 While in Andamooka I noticed lots of ovens in the lab of a fellow carbonizing matrix.

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Gambling With Chairs

It wasn't easy to find a little restaurant for a candlelit dinner in Andamooka and it probably never will be.

But I managed to find a secluded little dining spot one night back in the late 1960's. It was very small and dimly lit. I enjoyed a quiet meal while three guys in the other corner about 4 yards away played cards. It looked a bit like poker. They were speaking some European language that had no meaning to me. It was the sort of foreign language talk I would hear all the time in opal mining towns. I didn't understand it. I just let it happen and so it became background.

I was taking no notice and the night wore on. The meal came and went. The dessert came and went. Next it was coffee time. Then suddenly out of this background banter of foreign noise one of the three card players, the big guy, raised his voice. He was shouting at the top of his voice at the little fella opposite him. He gradually stood up without moving his feet. Straightening his legs his chair slid back screeching on the floor and the table in front of his belly tilted forward scattering all the cards. He twisted his body around, and in one smooth action picked his chair up from behind himself with both hands and swung it over his shoulder. The chair accelerated as he swung it like a baseball batsman attacking the ball, but instead of a ball it was this little guy's head. He brought the chair down on him with tremendous force and kept the chair going in a big circular action and did it again and again.

Bits of wood started flying off the chair as the little fella went to the ground. He kept swinging that chair. It started to break up. A leg came off here and a foot rail came off there and then the whole thing broke up.

He suddenly stopped hitting the little fella on the floor. Blood was coming out of his head. The big guy looked at the chair with a quizzical look like he was thinking, "Gees, I think there's something wrong with this chair!?" He looked across at the tavern owner and said, "Hey Gus, this chair is kaputt!" He threw it to the ground next to the little fella and strolled out of the restaurant like nothing had happened.

Gus rushed over and attended to the little fella and got him off to the nurse at the hospital. He hadn't been too badly damaged, but suddenly it was all over; that was it. He'd done something wrong; maybe he'd cheated at the game or disobeyed the big guy sometime recently. The big guy didn't like it and the little fella paid...he won a chair.

I went on sipping my coffee. Gus threw the old chair remnants away and put another in its place and went back to cleaning glasses, just like nothing had happened.

David J. Oldfield peacepie@iprimus.com.au, is an expert opal cutter whose sole US distributor is Dida Kutz, at www.CandidaOpals.com Color your Life with Opals!

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Meet A Future Jewel Of Technology: Gem Of A Beetle Which Thinks It's An Opal

By Deborah Smith, Science Reporter

December 18, 2003

Pachyrhynchus argus . . . layers of transparent spheres packed in a precise hexagonal pattern in this beetle emulate that of the opal.

This Australian beetle really is a gem: the greenish scales on its back are identical to opal.

Andrew Parker, a former researcher at the Australian Museum, was amazed when he examined the internal structure of the scales under a powerful microscope and realised it was the same as that of the precious stone.

"This is the first time opal has been found in animals," said Dr Parker, who is now at Oxford University in Britain.

The find could lead to a new method for synthesising opals, not only for use in jewellery, but as components, known as photonic crystals, for the computers of the future, which will rely on the movement of light.

The beetle, *Pachyrhynchus argus*, is commonly found in the rainforests of north-eastern Queensland. Its particular pattern of patches of metallic gleam had probably evolved to make it recognisable to other members of its species in the dim light under the forest canopy, Dr Parker said. "The optical effect created by this weevil makes it appear strongly coloured, whatever angle you look at it."

The discovery is published today in the journal *Nature*.

The colour of most opals, and the beetle's scales, is the result of light being reflected from layers of transparent spheres, packed in a precise hexagonal pattern.

The beetle reflects only one colour because all of its nano-spheres are exactly the same size - about 250 nanometres across (a nanometre is a billionth of a metre) - whereas multi-coloured opals have a range of different sized nano-spheres.

Dr Parker said that although liquid opals were easy to make, synthesising solid ones was notoriously difficult. His team has begun to try to fathom how the beetle creates an opal-like structure using the chemical "factories" inside its cells.

"If we can emulate the weevil's means of opal production this would represent a technological breakthrough, particularly since opal, as a photonic crystal, has numerous industrial applications," he said.

Scientists have already had some success copying nature, recently creating artificial mother of pearl by mimicking the way abalones build up nanolayers of different materials to make their shells.

But the beetle's method for making perfect opals posed a bigger challenge than this, because it probably used clever pieces of tiny machinery, such as molecular motors, and templates to extrude the nano-spheres, Dr Parker said.

From the Sydney Morning Herald, http://www.smh.com.au.

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Life Of Opal Miners

Opals were discovered in 1915 at Coober Pedy, an isolated spot in the center of South Australia, thousands of miles from the nearest town. The town now houses more than 4,000 inhabitants and is still the main opal-producing center in Australia—or anywhere else. Ninety percent of the world's opals come from Coober Pedy or from nearby Andamooka.

In spite of continuous mining since 1916, it is estimated that less than 2 percent of the existing opal stock has been brought to the surface. Mining operations are kept to a small scale by government regulations. The law permits each miner to stake only one claim and limits that claim to an area of 540 square feet. No more than four people may form a partnership. So large mining concerns have no place in the town, which remains a rough and ready community of individuals hoping to make a fortune by their own efforts. To get a chance at wealth, the miners contend with a multitude of discomforts—the worst is extreme heat.

For four months of the year, the average temperature is 97°F, rising to 104°F or more for days. Dust from the mining often swirls into blinding storms that make taking off and landing at the rocky airstrip nerve-racking. The only water comes from a saline well and the fresh water provided by a solar desalination still is precious: each resident is allowed 120 gallons a week. To escape the crushing heat, many people at Coober Pedy have retreated underground, into caves dug out of the slope where the opals were first discovered. The gypsum in the rocks makes it possible to hollow out sizable chambers that will not collapse. Some homes are spacious and even luxurious: and if the occupants decide to add a room by carving out the rock, there is always the chance that they may find a few gems.

From Rocky Trails, 6/01, via Osage Hills Gems 1/02 Page 4 April / May 2003 Port Townsend Rock Club News

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No Relief for the Earth

by Richard Busch (FGMS Member)

Just how much relief does the Earth have? I mean, suppose that someone gave you a two-foot diameter sphere and a bucket of modeling clay and told you to construct a three-dimensional, exact scale model of the Earth. How much clay would you have to slather on the sphere in order to accurately model the Earth's mountains? Would you have to put on a quarter of an inch thickness of clay? Half an inch? One inch? More?

Time to yank out the old geography book. Let's see ... The radius of the Earth at the equator is 3,963 miles. The radius of our model Earth is 12 inches. The elevation of the highest mountain on Earth, Mount Everest, is 5.5 miles. So how high will our model Mount Everest have to be?

Uh-oh, this looks like a job for (*gulp*) proportions! Ok, one step at a time: 3,963 miles is to 12 inches as 5.5 miles is to x inches. Solving for x we get:

x = ((12)(5.5))/3963 = 0.017 inches

That's only 1/60 of an inch! Kind of hard to believe, especially if you're standing next to Mount Everest, but it's true. The Earth is actually so smooth that it only takes a light smear of clay on the surface of a two-foot diameter globe to accurately model the Earth's mountains. I guess we'll just have to look at someplace other than the Earth for relief.

From the *Lithosphere*, 4-93 Fallbrook G & M Society

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Triplet Tips and Tricks

Briefly I have recorded the following as "Howard's Triplet Making Demonstration of 1992" Howard uses his faceting machine, a coffee pot of water, Opticon 200 and epoxy 330 to make triplets. He advises: Cut with 100, 320 or 600 grit lap. No finer than these or you will be working too hard to find the fire.

If your opal has two bands of fire, grind down to the first layer and glue basenite on top of the cut area with epoxy 330. Make your next cut between the bands of fire. The backing will allow you to hold the stone more secure when cutting between them.

Using slow speeds on the faceting lap, make the opal as thin as 3 newspapers and not milky. Make sure the opal does not hydroplane. Cut a little, look a little.

Use optical quartz for cap. Cut quartz on 600 grit. Get rid of angular lines by using a circular motion on a stopped lap.

Wipe off the stone and place it on top of the coffee pot lid and warm it and the quartz cap. Watch for cracks, if they appear, cool the stone slightly, use Opticon 200 and smear with a toothpick, wipe slightly to remove excess and replace it on the coffee pot lid to re-warm. Howard uses it on each stone whether cracks form or not.

Using epoxy 330 in a packet made with foil, warm it on the coffee pot lid and then stir to get the bubbles out. Spread onto the surface of the stone with a toothpick and squeeze the quartz cap onto the stone and slide it back and forth just a bit. To check to see if there are bubbles, spread some epoxy on the quartz top. Wipe off when the check is complete. If the stone is not set completely and there are bubbles, you may be able to retry by removing the piece and wiping them off and starting again.

Place nearly finished triplet on top of coffee pot lid to set up. Wait 15 minutes.

If you use precut quartz cabs, make sure the bottoms are flat by placing them on a lap and rubbing them flat. Use a pencil eraser to move a small cap around to the correct position on a stone.

To help the final cabbing process, just before the glue sets, form a groove around the cap with a metal tool to form a guiding groove to trim by. Glue will be jelly-like. To cut basalt; use a glasscutter.

Complete the triplet by trimming away any excess material as close to the groove guide a possible. Finish the cab as usual.

From The Opal Flash, 2-2002

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The "Art" Of Finding Opal

An Excerpt From Opal Adventures

by Paul B Downing, Ph.D.

In our visits to the various Australian opal fields, we have met many miners who have found a lot of opal The subject always arises as to how it came about that they decided to mine where they did The answers vary. It is common that the successful miner has been mining for a number of years Usually

they have mined on several fields within a mining district and often they have mined in more than one district each has his pet theory as to why the opal is where they found it and there is little consistency among these theories Yet there is one consistent opinion among these successful miners Most miners who have made a big find freely admit That finding opal takes a lot of hard work and especially a lot of luck! Les Taylor in Struck by Lightning tells of a man who just arrived on the field and asked Lea how to find opal. Now Les at this time had been mining for a number of years and had never found anything. So he told the man to go out in the field, toss his hat in the air, and dig where it landed, which is exactly what the man did He bottomed his shaft on a huge pile of gem opal. Pure luck.

There is perhaps no case which better illustrates this point than that of a Lightning Ridge miner we met on this first trip There is nobody on the fields who is better equipped to use science to find opal This miner has a Ph. D. in Mineral Geology from Harvard. He has been successful over the years in finding many large mineral concentrations in many different locations throughout the world. After retiring he moved to the Ridge and started looking for opal He used all the scientific knowledge available to him. He tried one spot after another with little success. Science didn't seem to be working.

One day he and his partner, a an with much experience on the Ridge, but no formal training, heard that a friend had sunk a shaft in a new area and had real good indications of opal. They went tout to see this new site. Indeed, the ground at the bottom of the shaft looked quite promising so they decided to peg a claim nearby. Our scientific friend looked around the area. Nearby was a line of trees going up the ridge. Several old miners had told him that opal is often found under such tree lines. He picked a spot to dig his shaft in the shade of one of the trees. When his partner asked him why he chose that spot his reply was that the tree would provide shade from the hot sun. The partners put down two shafts six feet apart to provide air circulation and started finding opal and lots of it only a few feet into their first drive. They have since taken a great deal of opal out of this mine. It was luck, not science, that led this miner to his big find. Yet the tree line probably signified a fault in the earth, which can cause concentrations of opal.

Another method, whether scientific or luck I will let others decide, is divining. We met three retired couples at the Bowling Club one night and as luck would have it, they were at the field we visited the next day. One man was holding two lengths of wire bent at right angles, which they had recently liberated from a nearby fence. He whirled term around to "warm 'um up", and walked with them pointing straight ahead. At a certain point they would cross and as he walked on they would become straight again. Bobbi tried it and I swear the wires moved of their own accord at the very same spot! We checked with these fine folks several times to see if they found opal this way, but they had no luck by the time we left. The next year we entered a mineshaft winch crossed a fault. The divining rods crossed at the fault, just where the miners had found a lot of opal.

If there is an art to successful opal mining it might be this Pick an area where others are finding opal. Stand in the middle of an unpegged area and throw your lucky hat into the air. Dig a shaft where your hat lands. If you don't find any opal, get a new hat!

Thank you Paul for allowing us to print small portions of your book, From the Opal Express 4-1990

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Abalone

(Editor's note – due to the near extinction of the species the harvesting of Abalone in Canada is prohibited – please use only old shells or from foreign sources)

Abalone, (Haliotis), for over 80 million years, has been grazing on algae in the selected waters of our planet earth. Eight species may be found along the West Coast of the North American continent, from Mexico to the Aleutian Islands. They are: Red Black, Corrugated, Green, Flate, White, Pinto, and Threaded.

These shells are comprised of multi-layered "Mother of Pearl" nacre, chemically similar to the Oyster. Colour bands found in the shells are a direct result of diet and genetic factors. The outer layer is protected by a covering called Peristrum, which is a translucent shellac-like overlay.

These beautiful shells have been found all over the world in many forms. In ancient times, royalty decorated their robes and turbans with them, Stings of Abalone shell jewelry were used by the women. During the era of barter and trade, the Abalone was often used as "coin of the realm". In many parts of the world, at archeological digs, artifacts have been found made from these shells. Today, many forms of jewelry, from formal to baroque, are designed with the unique characteristics and beauty of the Abalone utilized to the fullest.

Many steps are used in the preparation of the shell until its final lustrous beauty is brought to life in the creation of fine jewelry.

Working with Abalone

(Editor's note – Abalone is extremely toxic if worked dry. Do not ever work this material unless the piece is under a steady stream of water. If you feel the least bit nauseous even when working it wet – stop immediately and get plenty of fresh air.)

Starting with the raw shell, it must first be soaked in a chemical to rid it of algae and parasitic crustaceans. It is scrubbed, dried, sandblasted, before it is ready for cutting. Rough shapes are formed by saw, drill, and Dremal tools using diamond edged tools. This work should be done under water, with a worker wearing a respirators, plus fans blowing for ventilation to protect the workers from Silicosis, due to the dust of Calcium Carbonate from the shells.

After the cutting operations are completed, the shell parts can be placed in a tumbler for 24 to 72 hours with three changes of grit. The shell is then washed, and buffed to a high gloss finish. This last operation can be done either mechanically or by hand. The shell should now be a beautiful creation of vivid colour worthy of any jewelry setting.

All that is left now is the imagination of the craftsman. The shell can be drilled for jump rings, epoxied for any glued style, or prong set for special effects. Completion of any of these operations assures the individual of the finest in Abalone jewelry.

The world's population has for years, gorged itself on these delectable Gastropods (Editor's note – if you enjoy fish flavored shoe leather ;)), thus over-harvesting their reproductive capacity. The Sea Otter also includes Abalone as a main part of his diet, and that also reduces the reproduction. Our federal government has stepped in and placed an "Endangered Species" label on the Abalone for these reasons. Quantity limits as well as size limits have been placed on the harvesting of

them. Thus, the Abalone has become more valuable, both as a food source and a jewelry source.

From the Ultralite Co. Inc. via Chips and Tips, via Palomar Gem 2-03

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Dna Traces Found In Ancient Rock

By Ivan Noble BBC News Online Science Staff Thursday, 23 May 2002 Scientists say they have found traces of ancient bacterial DNA that are dozens of millions of years old. There have been many reports of discoveries of ancient DNA, but most have been dogged by suspicions of contamination. Now, Bill Grant of the University of Leicester, UK, says he is sure the samples his team found are from genuine ancient rock.

For Sure

They looked at tiny samples of rock salt from Poland, the United States and Thailand - some of it thought to be 425 million years old. Dr. Grant and his colleagues drilled into the tiny lumps of rock salt with a special laser. In each case, they took care to find a piece of the rock that was genuinely ancient rather than a piece contaminated by more modern water.

Scientific Controversy

"*We took that piece out, bring as careful as we could to avoid contamination. Then we looked for* of the scrutiny his work will receive after dozens of reports which have been disputed over the years. *"There are well known and respected people who believe that DNA can't survive more than 100,000 years or so. "Its basic chemistry means that the bonds in it fall apart*," he said. But such experts had based their work on DNA kept in relatively dilute liquids and little work had been done on how DNA survived in extremely strong salt solutions, he said. "*We think that salt has particular preservation qualities*," he said. The bacterial DNA traces his team found were in tiny pockets called *fluid inclusions* created as the rock salt formed. Dr. Grant and his colleagues describe their work in the journal Nature.

via Breccia, 6-02, via http://news.bbc.co.uk , via Port Townsend Rock Club News 1-03

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Lava Unlocks Subterranean Mysteries

Hawaiian Volcano Observatory Press Release (9-1992)

To the non-geologist, lava is hot, orange, molten rock or, when cooled, smooth and gray or black and jagged rock. However, to the geologist or volcanologist, lava contains a set of clues to decipher processes occurring in the interior of the Earth and the volcano. [These processes, once understood, form the basis of eruption forecasting, including eruptive style (passive or explosive), magnitude, and timing.] Magma (lava before it erupts) consists of molten rock, crystals, dissolved gases, and bubbles. Sometimes there are also fragments of the rocks through which the magma moved, called xenoliths. Many lavas have had complex histories that include cooling and forming crystals, loss of gases, re-melting of rock that surrounds the magma body inside the volcano, and mixing of different magmas. In order to understand the initial formation of the magma deep inside the Earth, one needs to be able to "see through" the effects of all these processes.

Magma that moves up into Kilauea Volcano, from perhaps one hundred miles deep, arrives at a temperature of about 2,480 degrees F. However, lavas with eruption temperatures this high have been found only along the submarine part of Kilauea's East Rift Zone. The lavas erupted near the summit and along the subaerial part of the rift zones commonly have temperatures in the range from only about 2,040 to about 2,190 degrees F. Clearly, these lavas have had to cool by several hundred degrees within the volcano before they erupt. Cooling of magma causes crystals to form. In Hawaiian lavas, the first crystal to form as magma cools is olivine, the mineral that forms green sand beaches.

As magma is stored inside the volcano in a magma reservoir, it also loses some of the gases that are dissolved in the melt. The main gas components in magma are carbon dioxide, water, and sulfur gases. Most of the carbon dioxide, and some of the water and sulfur dioxide, leaks out of the summit of the volcano as the magma is stored in the magma reservoir about 3 miles below. During this period of storage, the magma may also melt the rocks adjacent to the magma reservoir, thereby changing the chemistry of the magma. Sometimes groundwater or hydrothermal fluid is added to the magma with dramatic results. Explosive summit eruptions at Kilauea, such as those in 1790 and 1924, were caused by addition of water to the magma stored inside the volcano (this phenomenon is rare however).

There are numerous separate batches of magma stored inside the volcano at any time. Each has slightly different chemical characteristics that can be used to trace mixing of the different batches. Most eruptions at Kilauea appear to involve several of three magma batches that have mixed with each other. Commonly, the magmas that mix have different temperatures and contain distinctive assemblages of crystals. Upon mixing, some of these crystals dissolve back into the melt while other crystals grow rapidly. If the magma is erupted soon after the magma batches mix, these crystals are quenched before they can dissolve. However, if mixing predates the eruption by more than a few days, the evidence for mixing will have been erased.

From April 1993 issue of *Lithosphere*, the official bulletin of the Fallbrook Gem and Mineral Society, Inc;

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January Gem & Mineral Shows

JANUARY 2004

2-4--ROSEVILLE, CA: Show; Gem Faire; Placer County Fairgrounds, 800 All America Blvd.; Fri. 12-7, Sat. 10-7, Sun. 10-5; weekend pass $5; contact Gem Faire, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com.

2-4--YUMA, AZ: 31st annual show; Colo-Gila Kiwanis Club; Yuma County Fairgrounds, 2520 E. 32nd St.; Fri. 10-5, Sat. 10-5, Sun. 10-4; adults $1, children free; contact Dave Johnson, P.O. Box 647, Yuma, AZ 85366, (928) 782-9043.

9-11--PHOENIX, AZ: Show, "AZ Rockfest and Earth Science Fair"; Specialty Productions Development, Mineralogical Society of AZ; Tempe Diablo Stadium, Exit 153 off I-10; Fri. 9-5, Sat. 9-5, Sun. 9-5; over 13 $5, ages 7 to 12 $3, under 7 free; 60 dealers and 20 earth science organizations; exhibits, gold panning, giveaways, grab bags, demonstrations, spin the wheel, rock-climbing wall; contact W.R. Russ, 4515 E. Joan de Arc, Phoenix, AZ 85032, (602) 929-7802 or (602) 684-7381.

9-11--SANTA ROSA, CA: Show; Gem Faire; Sonoma County Fairgrounds, 1350 Bennett Valley Rd.; Fri. 12-7, Sat. 10-7, Sun. 10-5; weekend pass $5; contact Gem Faire, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com.

9-18--LAUGHLIN, NV: 3rd annual show; Cloud's Jamboree; Riverside Resort; contact Cloud's Jamboree, PMB 2289, 1650 S. Casino Dr., Laughlin, NV 89029, (866) 558-7719; Web site: www.cloudsjamboree.com.

16-17--GLOBE, AZ: 47th annual show; Gila County Gem & Mineral Society; Gila County Fairgrounds; Fri. 9-5, Sat. 9-5, Sun. 9-4; adults $2, students with ID and children with adults free; dealers, demonstrations, door prizes; contact Bill Morrow, (928) 425-0194, or Lila Lambrecht, (928) 425-3459.

16-18--DEL MAR, CA: Show; Gem Faire; Del Mar Fairgrounds, 2260 Jimmy Durante Blvd.; Fri. 12-7, Sat. 10-7, Sun. 10-5; weekend pass $5; contact Gem Faire, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com.

23-25--SANTA CLARA, CA: Show; Gem Faire; Santa Clara County Convention Center; Fri. 12-7, Sat. 10-7, Sun. 10-5; weekend pass $5; contact Gem Faire, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com.

JANUARY-FEBRUARY 2004

1-28--QUARTZSITE, AZ: International show; Desert Gardens; 1155 Kuehn St.; Sun. 9-5, Mon. 9-5, Tue. 9-5, Wed. 9-5, Thu. 9-5, Fri. 9-5, Sat. 9-5; free admission; more than 200 vendors dealing rocks, gems and minerals; contact Sandra McAllister, P.O. Box 619, Quartzsite, AZ 85346, (928) 927-6361; e-mail: dggemshow@ureach.com.

2-1--LAUGHLIN, NV: 3rd annual show; Cloud's Jamboree; Avi Resort & Casino; contact Cloud's Jamboree, PMB 2289, 1650 S. Casino Dr., Laughlin, NV 89029, (866) 558-7719; Web site: www.cloudsjamboree.com.

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; more than 400 U.S. and international dealers, free shuttle to other shows; 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.

2004 Quartzsite Schedule

Jan. 10 - **Hi Jolly Daze Kick-Off Parade** www.quartzsitechamber.com

Jan. 23 -Jan. 25 - **Legends of the West** To Locate Hi-Jolly's Monument - Map - Map Ref. C

Jan. 1 - Feb. 28 - Desert Gardens Gem & Mineral Show - Map - Map Ref. - Look below the E; 928-927-5555 PO Box 619 Quartzsite, AZ 85346; South of I10 on access road (West side Kuehn St.)

Jan. 28 - Feb. 1 - 38th Annual Quartzsite Pow Wow - Map Ref. A
928-927-6325 PO Box 881 Quartzsite, AZ 85346

Jan. 17 - Feb. 1 - The Main Event - Map Ref. D; Mexicali Dancers, Fireworks, Hit and Miss Engine Show, Horseshoe Tournaments, Hot Air Balloons, Ultra Light, Bi-Plane and Glider Aircraft; 928 - 927-5213 PO Box 2801 Quartzsite, AZ 85346

Jan. 13 - Feb. 18 - Rice Ranch "17th. Annual Yawl Come Show" Map Ref. - Look below the A on Kuehn St; Rice Ranch "Camp and Sell"; 928-927-8118 PO Box - Quartzsite, AZ 85346

Jan. 2 - Jan. 11 - Tyson Wells Rock & Gem Show www.tysonwells.com - Map Ref. H;

Jan. 16 - Jan. 25 - Tyson Wells Sell-A-Rama

Jan. 30 - Feb. 8 - Tyson Wells Arts & Crafts Fair
928-927-6364 PO Box 60 Quartzsite, AZ 85346

Jan. 17 - Jan. 25 - 21st Annual Sports, Vacation & R.V. Show: www.quartzsitervshow.com - Map Ref. F; 800-969-5464 4952 Warner Ave., Suite 203 Huntington Beach CA 92649

Jan. 31 - Feb. 1 - 6th Annual Rock and Roll Classic Car Show ; 800-969-5464 4952 Warner Ave., Suite 203 Huntington Beach CA 92649

Jan. 28 - Feb. 1 - 6th Annual Hobby Craft & Gem Show
800-969-5464

Prospector's Panorama:

Jan. 2 - Jan. 14 Gold Show - Map Ref. G

Jan. 17 - Feb. 2 Gem & Mineral

Feb. 5 - Feb. 16 Peddler's Fair
928-927-6467 PO Box 786 Quartzsite, AZ 85346

Jan. 14 - Feb. 15 Four Corners Swap Meet - Map Ref. I; 928-927-5219 PO Box 620 Quartzsite, AZ 85346

Local & Outlying Accommodations
http://www.quartzsite.com/accoms.htm

44 Points of Interests & Tours: Quartzsite Chamber of Commerce 928-927-5600

Vendor Information and License: 928-927-4333 - Map Ref. - Locate the STAR