St. Croix Rockhounds
Doug Olson, Editor
211 Interlachen Way
Stillwater, MN  55082

***First Class***

# January, 2008

**Please send exchange  bulletins to:**

**Doug Olson, Editor**
**211 Interlachen Way**
**Stillwater, MN  55082**

**January 15th – The Program is:**
**Show and Tell &**
**Find of the Year**

St. Croix Rockhound's
LEAVERITE NEWS
Vol. 33, Issue 1; January, 2008

Member of: AFMS & MIDWEST FEDERATION

# ST.CROIX ROCKHOUNDS

MEETINGS: Club meetings are held the third TUESDAY of each month, at Stonebridge Elementary School on W. Elm. St. in Stillwater, MN at 7:15 P.M.. Everyone is welcome.

MEMBERSHIP: Full membership for a single person over 16 is $7.50 per year. Family membership is $10.50 per year.

OFFICERS:

| | | |
|---|---|---|
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The purpose of our organization is to bring together rock and mineral enthusiasts on a regular basis through membership and through pooling of individual knowledge, talents and skills, to improve the lapidary skills of participating members. Affiliation: American Federation of Mineralogical Societies and Midwest Federation of Mineralogical and Geological Societies.

**COMING UP! - January 15h:** St. Croix Rockhounds club meeting will be at Stonebridge Elementary School in Stillwater MN at 7:15 pm. The usual January program is **Show and Tell, Find of the Year.** So plan on bringing in your treasures.

## COMING ATTRACTIONS

**February 19th:** St. Croix Rockhounds club meeting will be at Stonebridge Elementary School in Stillwater MN at 7:15 pm.

**February 23-24th:** Anoka county Gem & Mineral Club show in Har Mar Mall in Rosedale, MN.

**April 8th:** Annual Silent Auction! Chicago Rocks & Mineral Society. Open to the public, no admission fee. The first tables close at 5:45pm. The auction is expected to last until 10 pm. Salvation Army, 4056 N. Pulaski Avenue, Chicago, IL.

**March 15th:** St. Croix Rockhounds Annual Club Show; Saturday 9AM – 4 PM (Saturday before Palm Sunday), at the Valley Creek Mall in Woodbury, MN

**March 14-17th: Annual Show, Cedar Valley Rocks & Minerals Society**, Teamsters Union Hall, 500 J St SW, Contact: Marv Houg, 319-364-2868, m_houg@yahoo.com

**April 12-13th:** Anoka county Gem & Mineral Club show at the Eisenhower Community Center, Hopkins MN.

**April 19-20:** Chippewa Valley Gem & Mineral Soc, Eau Claire Expo Ctr, Lorch Ave off Hwy 93, Contact: Roger Goss, Rgoss@cool.net, 715-723-0196.

**June 20-22nd :** MWF convention in Lincoln, NE.

**September 23-28th:** AFMS/RFMS show in Humble (Houston), TX.

**Minutes of the St Croix Rockhounds**
**December 21st, 2007**
**I have no minutes for this meeting.**

# FIXING NAVADA OPAL

***by*** *Ken Wetz*

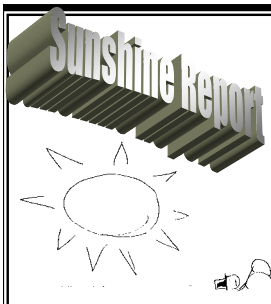
Quite a bit of the opal from Nevada while incredibly beautiful is also very unstable. I read somewhere that is because it came out of the ground several million years early and therefore was not finished. The water content is too high is what happens, and when you expose it to air it starts to dry, the spheres start to rearrange and cracking and flaking result.

I have heard of secret processes that supposedly can stabilize the stuff but funny thing is you read these but never see any results. I do remember years back a way to stabilize the stuff was to wrap it in wet paper and put it in a tightly closed plastic bag and let it dry out slowly over a course of a few years.

Which is what I have done with a couple of the pieces I dug up a couple of years back in Virgin Valley. Someday I will get brave and try cutting one. The best piece of course is in a bottle of water as I did not want to loose my prize to cracking. *-- non-commercial republish permission granted –*

*Lapidary Digest Sept 97 kwetz@acun.com via Stoney Statements 12/07*


*If paying dues by mail, send to treasurer:*
***Lin Rawlings***
***850 Woodduck Rd***
***Woodbury, MN 55125***




Our condolences to Pete Rodewald whose mom recently passed away.

if you have news - good or bad please call Marie at (651) 439-7809.

## January's Birthstone is the Garnet

The name "garnet" is derived from the Latin "granatum" meaning "pomegranate" because the crystals resemble the red color and seed-like form of this fruit. Most people think of the garnet as a red gemstone, but in fact, it exists in all kinds of colors, such as black, many shades of red and green, or even colorless. The garnet's variety of colors comes from metals such as manganese, iron, calcium, and aluminum. Some varieties even contain mineral fibers that produce the illusion of a four- or six-rayed star within the stone. Green garnets are most highly prized but are very rare. Emerald green and colorless stones are highly valued, followed by pure red garnets.

Garnets are commonly found as small pebbles in streams, where the igneous and metamorphic rocks that contain them have weathered away. They're found in many places around the world, including North and South America, Australia, India, Asia and Spain.

In the former Czechoslovakia, evidence of garnet jewelry dating to the Bronze age was found -- garnet necklaces were discovered in the graves of ancient lake dwellers. Garnet jewelry has also been discovered dating back to 3100 B.C. in Egypt, 2300 B.C. in Sumeria, and 2000-1000 B.C. in Sweden. Garnets were treasured in 3rd and 4th century Greece, and continued in popularity during Roman times. Across the Atlantic, Pre-Columbian Aztec and Native Americans also used garnets in their ornaments.

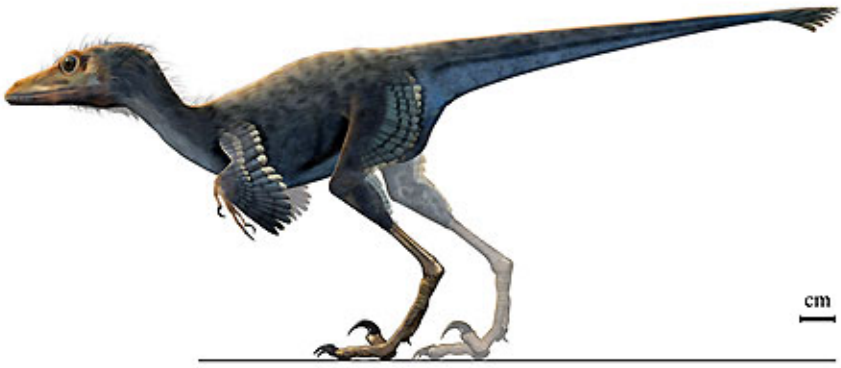
As with many precious stones, garnets were once believed to hold medicinal powers. In Medieval times, it protected its wearer against poisons, wounds and bad dreams, and cured depression. Red garnets relieved fever, hemorrhages and inflammatory diseases. To modern users, the garnet symbolizes a light heart, loyalty and enduring affections.

**Birthdays**:

None admitted

**Anniversaries**:

None admitted




**THE TWO CAR - NO CAR GARAGE**

The garage is really large enough,
It's two or three cars wide!
However, we have so much stuff
The cars sit alone outside.
With flats of fossils, grinders, saws,
And rocks by the hundred pounds,
There is barely a path for us to walk
And the garage door won't go down.
We stare inside and shake our heads,
As the cars sit covered with snow.
I can't believe we have to stop
And scrape our car's window!
No matter how crazy this may sound
Our garage is "border to border"
We call our silly malady
**The Two Car - No Car - Garage Disorder!**

*from - Petrified Digest 07 / 06 Via - Delvings 12 / 06*

# Tiny Dinosaur Was Almost Ready to Fly

Remains of a petite dinosaur reveal that some of the ancestors of birds had already shrunk in size before flight evolved.

The dinosaur, a mere 2 feet long (70 centimeters) and weighing the equivalent of two cans of soda, roamed the Earth 80 million years ago during the Cretaceous period (between 146 and 65 million years ago).

"This specimen shows that dinosaurs evolved small size earlier than we previously thought," said study team member Julia Clarke, a paleontologist at North Carolina State University and the North Carolina Museum of Natural Sciences.

A prerequisite for flight is the ability to lift one's body off the ground. So for dinosaurs to take to the skies, they first had to "lose some weight."

But did already-small dinosaurs shrink further in size after they took to the air and became birds? Or did they first shrink in size before they could fly?

Paleontologists had previously assumed it was the first scenario that occurred, but the new finding, detailed in the Sept. 7 issue of the journal Science, suggests otherwise.

"Paleontologists have long thought that miniaturization occurred in the earliest birds, which then facilitated the origin of flight," said lead author Alan Turner, a graduate student at the American Museum of Natural History and Columbia University in New York. "Now, the evidence shows that this decrease in body size occurred well before the origin of birds and that the dinosaurian ancestors of birds were, in a sense, pre-adapted for flight."

The tiny tot, dubbed *Mahakala omnogovae*, was unearthed in the southern Gobi Desert region in Mongolia. Turner and his colleagues analyzed the fossilized bones, including portions of its skull, forelimb, hindlimb and much of the vertebral column.

By comparing *Mahakala* with other small meat-eating dinosaurs, and birds, the paleontologists showed small size was a common feature within the two dinosaur lineages most closely related to birds, *dromaeosaurids* and *troodontids*.

Specifically, they placed the new species at the base of the dromaeosaurids, a group of fierce predators equipped with switchblade-like talons, with the most famous member being "Jurassic Park" star *Velociraptor*.

However, the dinosaurs within these lineages didn't step down in size uniformly over time and, in fact, some of the dinosaurs' sizes ballooned by nearly three orders of magnitude. *via Stoney Statements 12/07*

## Quartz is not hexagonal and leucite is not cubic – the highs and lows of pseudomorphs

*by Julian Gray, GMS Member*

Figure 1 – A leucite trapezohedron

Here's a riddle for you: Look up leucite in your mineral identification book. It will say that it is tetragonal. Now look at the crystal drawing or photograph for leucite; it is a trapezohedron – a crystal with twenty-four equal sized trapezoids (Figure 1). Trapezohedrons, the most common crystal form of leucite, are a cubic or isometric crystal form. This is a diagnostic property of the mineral. But the book says leucite is tetragonal, not cubic (Klein, 2002). What is going on here?

Minerals often form at temperatures much higher than the temperature at which we collect the mineral. Go to your collection and find a quartz crystal. Get a good long prismatic crystal from Arkansas, not those stubby, doubly terminated Herkimer diamonds. We all know that quartz has six sides on the prism, the long part of the crystal. In 1669 Danish scientist Nicolaus Steno correctly pointed out that the angle between the same two crystal faces on all crystals of the same mineral always have the same angle. There are six sides to the prism and the angle between any two adjacent faces is equal. While these facts seem to scream hexagonal, look carefully at the *width* of the faces. Ah hah! Three alternating faces have the same width and the remaining three have a different width (Figure 2A). Now look at the termination (even on your Herkimer diamonds). There are three large triangular faces and between them are smaller triangular faces. Most if not all of the quartz in your collection is trigonal and not hexagonal. Big deal you say?

A. Low temperature or alpha quartz

B. High temperature or beta quartz

Figure 2 – Two common habits of quartz.

This may seem like meaningless trivia, but we can learn some interesting things about quartz from this minor formality. Quartz has many polymorphs, even in the crystalline varieties. Quartz, cristobalite, stishovite, and tridymite are all different forms of $SiO_2$. All the beautiful varieties of quartz (amethyst, rose quartz, citrine, smoky quartz) are $SiO_2$. The mineral that we call quartz actually has two forms – low quartz and high quartz. Low quartz is sometimes called alpha quartz and high quartz is sometimes called beta quartz. The low and high refer to the temperature at which the quartz forms. High quartz forms at temperatures above 575 degrees C (1,067° F) (Frondel, 1962, and Klein, 2002). High quartz is hexagonal and its crystal form is a six-sided double pyramid with a short or non-existent hexagonal prism (Figure 2B). Each of the triangular faces on the terminations are equal size. Low quartz, on the other hand, forms at relatively low temperatures. It is trigonal and has two trigonal (three-sided) prisms and two rhombs that produce the triangular faces on the terminations. Since this is the most common crystal habit of quartz, we know that most quartz crystals form at temperatures of less than 1,000° F (still pretty toasty!).

We all know locations for low (alpha) quartz crystals, but is it possible to collect crystals of high quartz with the true hexagonal crystal habit? Yes, of course. Rhyolite is a type of volcanic rock that is rich in silica and therefore will contain quartz. Since volcanic rocks form at high temperatures, the quartz is typically beta quartz – the high quartz variety. A micromounting buddy recently gave me some beta quartz crystals from the south shore of Dillon reservoir in Colorado. I know of one other location near Challis, Idaho. I strongly suspect there are many other locations. Any location with a rhyolitic ash could yield beta quartz.

Now for the hard part; the crystal structure of high quartz is not stable at temperatures less than 575° C. This doesn't mean that your beta quartz is going to disintegrate when you take it home. All that happens is that the internal arrangement of silica molecules rearrange into the structure of the low or alpha quartz. This does not change the shape of the crystal, but this internal structural adjustment to the low-form can cause the crystal to craze or become cloudy. Crystallographers can determine the structure of the quartz using X-ray diffraction. If you think of alpha and beta quartz as different minerals, which they are, then your beta quartz crystal is actually a type of pseudomorph called a paramorph! Your label should read "Alpha quartz after beta quartz": the low temperature mineral is replacing or pseudomorphing the high temperature mineral.

Figure 3 – The Cumberland habit of quartz (see White, 2003).

Are Herkimer "diamonds" beta quartz? No. They formed at low temperature and are alpha quartz. The fact that they are nearly perfectly hexagonal is merely fortuitous. There are other even better such examples of nearly hexagonal quartz that has formed at low temperatures. These are called the Cumberland Habit (Figure 3; see John S. White's excellent article in the May/June 2003 issue of Rocks and Minerals). John notes that these forms can be found at the Florence mine in Egremont, Cumbria, England, and at the second Sovietsky mine, Dal'negorsk, Primorsky Kray, Russia (White, 2003).

Now what about the leucite riddle? Easy. At high temperatures (above 605° C) leucite is isometric and forms the cubic tapezohedron. As it cools, it reverts internally to the low temperature tetragonal crystal structure (Klein, 2002). Since leucite is most commonly found in volcanic rocks, a high temperature environment, the cubic habit is most commonly observed. "Piece of cake" as my mentor use to say.

**References:**


Frondel, Clifford, 1962, *The System of Mineralogy*, 7th Edition, Volume III – Silica Minerals, John Wiley and Sons, Inc., New York, 334 p.

Klein, C.S., 2002, *The 22nd Edition of Manual of Mineral Science* (after James D. Dana), John Wiley and Sons, Inc., New York, 641 p.

White, John S., 2003, *Let's get it right – The Cumberland Habit, Rocks and Minerals*, v. 78, no. 3, p. 196-197.

**Higher Power** Earth's heat keeps continents afloat and land above sea level. Topography seems easy to explain when beholding jagged summits such as Colorado's Rocky Mountains or California's Sierra Nevada range. After all, these mountains mark spots where the continent grew thick during violent collisions with other tectonic plates; land crumpled and heaved skyward, like the hood of a car buckling in a head-on crash.

But surface-shaping geologic forces account for surprisingly little of the planet's highs and lows. About ½ of North America's elevation actually results from our planet's internal heat. Minus that warmth, most land would sink below sea level, say University of Utah geophysicists Hasterok and Chapman. Based on their recent calculations, parts of the Rockies and high sierras would shrink to mere islands, and cities such as New York would slip at least 200 meters (700 feet) underwater. Scientists have long known that heat must be part of the reason that the continental crust, which is about 40 kilometers thick on average, floats like foam atop the denser rocks of the mantle underneath. Although the crust's temperature varies from place to place, its bottom side is an estimated 400 degrees Celsius at its coldest. About 60% of that heat rises from the earth's fiery interior; the rest builds up from decay of radioactive elements. And, like most materials, the rocky crust expands, and thus floats higher, the hotter it is.

Despite this seemingly simple relation between temperature and elevation, ovserved topography correlates poorly with measurable heat flow. Hotter does not always mean higher.

Such discrepancies exist because the makeup of the continental crust, which also varies from one region to the next, exerts its own influence on buoyancy; some rock types are denser than others; regardless of temperature. The other complicating factor is the crusts' variable thickness. Geologic forces not only pile up mountains in some places, but also stretch the crust thin in others.

To isolate heat's role, Hasterok and Chapman came up with calculations that strip away effects of composition and thickness for 36 geologic provinces across North America. For resulting elevations, hotter usually does mean higher. Colorado Plateau is about 1,500 meters (5,000 ft) higher than the Great Plains, even though the same rocky types underlie the two regions, mainly because crust below the plateau is an estimated 150 degrees C warmer than crust under the plains. If the elevation doesn't reflect heat flow, then we know something else is going on. One region of crust under northern Canada is hotter than thermal elevation suggest it should be… almost certainly because a higher-than-average concentration of radioactive isotopes is heating rocks near the surface. To contribute to the buoyancy in any notable way, heat would have to warm up a deeper part of the crust. Regions that look hot relative to their thermal elevations could be good targets for uranium or thorium mining. A mismatch between thermal elevation and heat flow can also tell scientists about timing of certain geologic events. That thermal elevation of Sierras is higher than expected suggests that a particularly hot chunk of mantle must be heating that part of the crust from below. That heat simply has not had enough time to rise all the way to the surface. Such insights are critical for modeling how mountains are built and how oceans form, because crustal rocks tend to weaken, and become more likely to break or fold, the warmer they get. Without earth's internal heat, most of North America would be underwater. *by Sara Simpson from Scientific American 11/07 via the Trilobite 11/07*

**In the late 1700s**, many houses consisted of a large room with only one chair. Commonly, a long wide board was folded down from the wall and used for dining. The "head of the household" always sat in the chair while everyone else ate sitting on the floor. Once in a while, a guest (who was almost always a man) would be invited to sit in this chair during a meal. Sitting in the chair, one was called the "chair man". Today in business, we use the expression or title "Chairman" or "Chairman of the board". *from Judy Crawfor from the SKP Genies via Rock Chips 5/07*

# Titus and the Glittering Flakes *by Dr. Bill Cordua, U. of Wisconsin - River Falls*

About 2500 years ago, everyone knew that Titus was the person to ask if you had an odd rock. His shop in Athens was legendary, crammed with the rare and marvelous. Once day, Titus traveled to the wild lands of Macedon to check on some reported finds of tin ore. He had been sent by Pericles, to find if it was a resource that needed to be protected from the Persians. Even though his journey was to be kept secret, his identity did become known on his way back, and he was sought by several to look at what they had found. Many were fooled by materials they thought to be gold, but which could be crushed readily to a black powder, showing it to be merely pyros.

One morning, as Titus and his servant, the cadaverous Aegirine, were breaking camps on the foothills of Oros Vemio, a portly gentleman hurried up and haled them.

"Are you Master Titus of Athens?"

Aegirine stepped forward, brandishing his staff. "Who wishes to know?"

"I am Oeneus. If that is indeed the famous Titus, I have a wonder to show him."

Titus said, "I am Titus. Pray let him come forward, good Aegirine and tell his tale."

"There is a stream near here", said Oeneus, "It's bed is full of flakes of gold. But as we try to pan it, the flakes float out instead of settling. If you can tell us how to work it, we will reward you handsomely."

"I must see this river. Please lead on". As they made ready to go, Aegirine hissed in Titus' ear "Now don't buy anything from him."

They walked a short distance over several ridges, then down into an open meadow through which bubbled a clear gently flowing stream. The stream emerged a short distance to the south from a dark canyon cut through massive rock. The bed of the stream was indeed covered by many flakes of a gold to bronze colored substance that glittered in the early morning sun. Two slaves were ineffectually at work wading the stream and trying to hand pick the flakes from the wet sand.

"See here," said Oeneus, scooping some sand onto a ceramic pan and agitating it into the current. The golden flakes took off like leaves in a breeze and wafted out of the pan. "It is impossible to concentrate them. That's why my slaves are picking them out by hand. How can gold behave thus?"

"Because its not gold," said Titus.

"Why do you say that?" demanded Oeneus.

"Because if it floats off in such a way that it cannot be gold. Let's have a look at some and I'll see if I can tell what it is".

Grumpily, Oeneas motioned a slave forward who had laboriously gathered some of the flakes. Titus took some and sprinkled them on a flat rock. He took a second rock, ground the flakes between the two, and then examined the result

"Look how this breaks. It crumbles as gold will not. Also see how light can penetrate through these thin pieces. This is not gold at all, but rather a form of speklopoisos. It has little value.

Oeneas took this news stormily. "I know gold when I see it. You just want to discourage me so I'll leave and you can take it all for yourself."

Titus laughed. "No, thank you. You are welcome to it. Carry on as you wish. We are late getting on the road to Athens."

Oeneas drew up his slaves so they separated Aeneas and Titus from the stream. "We're no fools! We're staying!" Oeneas yelled, then began cursing them.

His yelling voice could still be heard in the distance as Titus and Aegirine once more came upon the Athens Road

O.K. you 21st Century mineral people, what mineral formed the glittering flakes in the stream?

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Answer: The flakes are micas from the biotite group. Dark brown to black when fresh, they become bronzy when they weather, giving the superficial effect of gold when seen on a stream bottom on a sunny day.

# Stolen Gems *St Croix Rockhounds Leaverite News*

**Ripple marks on your slab?** There are several reasons for this problem:

1) the carriage (or arbor) may be out of alignment; 2) the blade may be dished; 3) the bearing may be faulty; 4) the blade may not fit the shaft properly; or 5) the feed speed may be too fast.

To find a remedy slow the feed speed. At the same time make sure the blade is sharp, if not, dress by running a piece of brick or grinding stone through several time. If this doesn't help, check the alignment. Check the bearings by trying to wiggle the shaft. If it wobbles, the bearings are faulty. Be sure there isn't any dirt under the shaft collars. If your check indicates misalignment, and you don't have the experience to re-align the carraige, contact your supplier or manufacturer.

Don't let the blade slow down during curring. Variation in RPM destroys accuracy, reduces cutting efficiency, and dulls the cutting edges of the blade. Use ample motor power. When running the piece through by hand, use only light, firm pressure.

Tighten vise clamps after every few cuts for a smoother cut. Successive slabs are sawed from one piece of rough. To cushion rocks in a vise, use rubber composition such as stair treads or boot soles. If blocks must be used, line with composition for a snug fit.

To mark rocks for trim sawing, use a Flair pen instead of the aluminum pencil. It is easier to see and doesn't run in oil coolants. It is also water soluble. *from the Gemrock 03/00 via Rock Chips 12/07*

**Topping Malachite –** Working with malachite is a messy operation, so I stop as soon as I can. I make doublets with malachite on the bottom and synthetic quartz on the top. This makes the malachite look even better than it would with polish, plus the quartz cap magnifies and accentuates the pattern. I use the synthetic quartz made for space shuttle windows and produced by an outfit in Cleveland, Ohio. If find that this stuff is tougher than natural quartz. *by Jerry Harr from Strata Gem 10/03 via Rock Chips 12/07*

**Agates can be cut** and polished on diamond, but we prefer to use carborundum grinding wheels and polish with cerium oxide on hard felt. You can also use leather or poly-pads. Try a little red rouge when polishing. It seems to give a more glassy finish. One thing to remember is to get rid of all scratches from the grinding stage with a 600 grit sanding disc or belt before proceeding to the polishing step *from Strata Gem 10/03 via Rock Chips 12/07*

**Be careful when buying amber.** Some dealers will sell copal as amber. Copal is softer than amber, it has a tendency to craze, and when exposed to ether it becomes sticky. Under a short-wave ultraviolet light copal may fluoresce white, whil amber may fluoresce blue or yellow. *from Strata Gem 10/03 via Rock Chips 12/07*

**Stones to carve:** the following stones may be carved with only a file and/or motor tools and a few hand tools:

Sepiolite (meerschaum) – the material to make pipe bowls. Work and finish with steel wool.

Alabaster (gypsum) – hardness varies. Hard types respond well to hand tools; others with files and wet or dry sandpaper.

Talc (soapstone) – work with files, sandpaper and carving tools.

Anthracite (coal or jet) – work with files and sandpaper. Polishes to a shine equal to hematitie.

Calcite (marble, onyx) – with with hand, steel wool and tungsten bits.

Argonite – similar to calcite and worked the same.

Howlite – worked with hand tools and has the advantage of being dyed easily.

Most of these can be sawed with a hacksaw and polished by hand with a piece of leather and tin oxide. *from Strata Gem 10/03 via Rock Chips 12/07*