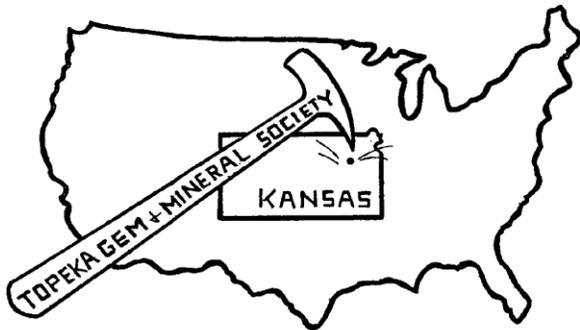


The Topeka Gem and Mineral Society, Inc.  
 1934 SW 30<sup>th</sup> St. Topeka, KS 66611  
 Rock2Plate@aol.com

# THE GLACIAL DRIFTER



[www.TopekaGMS.org](http://www.TopekaGMS.org) or  
 Facebook: Topeka Gem and Mineral Society Field Trips

The Topeka Gem & Mineral Society, Inc.  
 Organized December 3, 1948

Member of Rocky Mountain Federation of  
 Mineralogical Societies American Federation of  
 Mineralogical Societies



The Glacial Drifter, Vol. 60, No. 3, Mar. 2017

The Purpose of the Topeka Gem & Mineral Society shall be exclusively educational and scientific: (1) to promote interest in geology and the lapidary arts; (2) to encourage the collection and display of rocks, gems, and minerals; (3) to encourage field trips and excursions of a geological, or lapidary nature; and (4) to encourage greater public interest and education in gems and minerals, cooperating with the established institutions in such matters.

Meetings: 4<sup>th</sup> Friday of each month, September to May, 7:30 pm, Stoffer Science Hall, Room 138, Washburn University.  
 No meeting in December unless notified of a change. Picnic meetings are held June, July and August.

Dues: Individual, \$15.00; Couple, \$20.00; Junior (under 18 years of age), \$5.00. Dues are collected in December for the following year. Send dues to: **Millie Mowry, Treasurer, 1934 SW 30<sup>th</sup> St, Topeka, KS 66611.**

[www.TopekaGMS.org](http://www.TopekaGMS.org)

## 2017 OFFICERS AND CHAIRS

President	Mike Cote	220-3272	Cab of the Month	Debra Frantz/Fred Zeferjohn	862-8876
1 <sup>st</sup> Vice Pres.	Dave Dillon	272-7804	Field Trip Coord.	Leslie Hartman	380-6016
2 <sup>nd</sup> Vice Pres.	Carolyn Brady	233-8305	Publicity	TGMS Board	-----
Secretary	Cinda Kunkler	286-1790	Welcome/Registration	Russ & Rhonda Miller	272-6408
Treasurer	Millie Mowry	267-2849	Property	M. Cote/D. Dillon	220-3272
Directors	Harold Merrifield	633-9745	AFMS Scholarship	Cinda Kunkler	286-1790
	Chuck Curtis	286-1790	Editor/Exchange Editor	Millie Mowry	267-2849
	Brad Davenport	379-8700	Show Chairman	Harold Merrifield	633-9745
Historian	Deborah Scanland	273-3034	Show Dealer Chairman	Dave Dillon	272-7804
Federation Rep	Harold Merrifield	633-9745	Show Secretary	Cinda Kunkler	286-1790
Corporation Agent	Millie Mowry	267-2849	Jr. Rockhound Leader	Jason Schulz	640-6617
Librarian	open	-----	Show Case Coordinator	Francis Stockton	913-645-1131
Web Master	Jason Schulz	640-6617			

Area Code for all numbers is (785).

## EXCHANGE BULLETINS WELCOME

For exchange newsletters contact the club via mailing address listed above or email at [rock2plate@aol.com](mailto:rock2plate@aol.com) .  
Permission is granted to reprint articles only if proper credit is given to the author, Glacial Drifter and the date.

### Words from Our President

I want to thank Russ and Rhonda Miller for volunteering to take the position of Welcoming. We appreciate your help. I understand that the Job Description Notebooks project is well on its way to be completed. It will be very beneficial to all once it is done. If you are interested in a position within our club, you can see what all it entails in the notebook before you take the job and then be able to know how to do it.

Classes—everyone is asking when we are going to start up again at the Barn. Just as soon as the weather cooperates and stays warm. We will send out an email to let you know when. In the interim, Millie is still holding her Thursday afternoon wire wrap class if anyone is interested. Just contact her for more information.

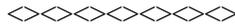
There is an open invitation to anyone that is interested in learning more about the Jr Rockhounds and maybe interested in teaching a class, so look for it under the Jr Rockhound section.

Mike and his Rock Stash

### Publicity

T-shirts and Hats are on the drawing board this year. They are almost ready and by the general meeting or before, we should have the final pricing of each. The hats will be black with blue TGMS letting & Logo in blue. The t-shirts are blue and will have generic letting on them so that they can be worn year round. Millie will be taking orders for both. She will be sending out an email to everyone as soon as we get the pricing.

Sponsors are being contacted again this year, so if you know of anyone that would like to become a sponsor, contact Lesliee.



**Visitors are always WELCOME at our meetings!**

## Jr Rockhound: FOSSIL OF THE MONTH FOR March:

### Fossil Crinoids Stems



**Description:** Because many crinoids resemble flowers, with their cluster of waving arms atop a long stem, they are sometimes called sea lilies. But crinoids are not plants. Like their relatives--starfishes, sea urchins, sea cucumbers, and brittle stars--crinoids are echinoderms, animals with rough, spiny surfaces and a special kind of radial symmetry based on five or multiples of five.



For more details read: <http://www.kgs.ku.edu/Extension/fossils/crinoid.html>

**Event Calendar**

**Mar. 2016**

1W	Jr Rockhound Mtg Rm 202 Anton
2T	Wire Wrap Class @ Millie's 1-3 p.m.
3F	
4S	
5S	
6M	
7T	
8W	
9T	
10F	
11S	
12S	
13M	
14T	
15W	
16T	Wire Wrap Class @ Millie's 1-3 p.m.
17F	
18S	RMFMS Conference- Albuquerque, NM
19S	RMFMS Conference- Albuquerque, NM
20M	RMFMS Conference- Albuquerque, NM
21T	
22W	
23T	Wire Wrap Class @ Millie's 1-3 p.m.
24F	General Mtg. Stauffer Hall Rm 138 7:30 p.m.
25S	Field Trip-Union Station-Pompeii Exhibit
26S	
27M	
28T	
29W	
30T	Wire Wrap Class @ Millie's 1-3 p.m.
31F	

**Apr. 2017**

1S	Jr Rockhound Mtg Rm 202 Anton Lincoln, NE Show-Lancaster Event Cntr 84 <sup>th</sup> & Havelock, Lincoln 9-6
2S	Lincoln NE Show 10-5
3M	
4T	
5W	
6T	Wire Wrap Class @ Millie's 1-3 p.m. Jr Rkhds Rm 202 Anton
7F	
8S	
9S	
10M	
11T	
12W	
13T	Wire Wrap Class @ Millie's 1-3 p.m.
14F	Board Meeting-7 pm Millie's
15S	
16S	EASTER SUNDAY
17M	
18T	
19W	
20T	Wire Wrap Class @ Millie's 1-3 p.m.
21F	Wichita Show
22S	Wichita Show
23S	Wichita Show
24M	
25T	
26W	
27T	Wire Wrap Class @ Millie's 1-3pm Williams Magnet School 5:30-7pm
28F	General Mtg. Stauffer Hall Rm 138 7:30pm
29S	
30S	

Any questions ask Millie at [rock2plate@aol.com](mailto:rock2plate@aol.com)

**Volunteering is the heart**



**beat of YOUR club**

# TOPEKA JUNIOR ROCKHOUNDS

<https://www.facebook.com/TopekaGMSJuniorRockhounds>

To register for the Junior Rockhounds or any of the classes, email: Leslie Hartman at: [Hartman.12345@hotmail.com](mailto:Hartman.12345@hotmail.com)



## Junior Rockhound Activity Center

We will have the Activity Center open for Jr Rockhounds at 7:00. We will meet at Washburn University 1700 SW College Ave., Topeka, KS in the Stoffer Science Hall Room 138.

### JR ROCKHOUND CLASSES

**(Some classrooms and dates may have changed so please watch for changes)** \*\*\*\*\*Here are reminders of the next 2 months of classes: Topeka Shawnee CO Public Library sign in starting at 6:00pm and classes starting at 6:30pm.

1. **1<sup>st</sup> Thursday, April 6, 2017, Badge # 1 Rocks**—instructor Brad Davenport, Room #202 Anton.
2. **1<sup>st</sup> Thursday, May 4, 2017, Badge #4 Lapidary Arts**-instructors Dave and Mike at the Barn 4910 Clark RD. Meriden, KS. Will not be at the library. Times will be the same.

**Junior Rockhounds you can always bring a new friend to class who are interested in rocks and minerals. You and your friend will get a surprise.**

### Future Field Trips

**Saturday March 25, 2017 (PLEASE email or call me so I know how many are going also bring cash to pay me back (or at the general meeting) because I have to pay ahead to reserve the spot for \$9.95 adult and \$9.95 child!!)** Union Station Pompeii Exhibit regular Price \$19.95 adults and child age 3-12 \$15.95 if 15 or more in a group then it is **\$9.95 adult and \$9.95 child.** Saturday 10-7. You will spend a good hour or so but if you like to take your time then it will be longer. No strollers. **Meet at 10am to count 15 people and sign in there before going through. We all have to be together to get the discount the same time.**

April 8 -- Olathe G&M group is tentatively scheduling a field trip to the Salt Plains National Wildlife Refuge (near Jet, OK) to collect hourglass selenite crystals. If you like to come let me know so I can tell them to expect you. My family will be going. I will update hours later.

Wichita Gem & Mineral Show @ Cessna Activity Center 2744 George Washington Blvd  
Friday April 21<sup>st</sup> 9am-6pm, Saturday April 22<sup>nd</sup> 10am-6pm (Field Trip for TGMS & JR Rockhounds), Sunday April 23<sup>rd</sup> 10am-5pm Discount door tickets available.

## Serious Invitation

**We need more instructors! This is an invitation for anyone who would like to teach a Jr Rockhound class to come and visit one of the classes and watch the instructors teach. After the class or a couple of classes you decide to still teach a class we would be happy to set you up with one of the instructors to become an intern-instructor.**

**Also, at our general meetings we have special speakers who come to talk about their field trips and experiences in the fossil field. We would like to carry this over to our Jr rockhound classes. If any of you would like to do a show-n-tell of any field trips, we would love for you to visit one of our classes just for up to 30 minutes. Please contact me for further details. [Hartman.12345@hotmail.com](mailto:Hartman.12345@hotmail.com)**

Working Together WORKS!

# Growth Forms Of Quartz

by Beth Heesacker

This installment will cover the growth forms of quartz. These are the crystals that are imperfect and distorted. That does not mean that they are any less beautiful but in most cases as even more beautiful and interesting. And a crystal ball is NOT a growth Form.

**Split Growth - sprouting and artichoke:** If a crystal widens as it grows until the tips split. This is called a split growth. One type of these has daughter crystals growing on its side and is called a sprouting crystal. These side crystals point slightly outward. The other type is the artichoke in which the crystals subdivide so that they look like sheaths surrounding a central crystal. Since these are so similar there of course will be transitions and mixtures found.

**Cathedral Growth:** This growth is similar except that the side crystals are parallel to the central crystal.

**Bent Growth:** Some crystals are stressed so that they break or are displaced. These fractures heal and if it happens multiple times the crystal will look bent.

**Cactus Growth:** A growth of second generation crystals grow on the faces of this type of crystal and point away from the central crystal.

**Corroded Growth:** Rising temperatures, etching solutions or higher pressure can partially dissolve the crystal. Sometimes these surfaces heal which can give interesting crystal shapes. Sometimes just the surface is etched and becomes dull or the edges are rounded.

**Elestial Growth:** This growth seems to be a collection of forms with a particular look. Small crystals grow on the top of the main crystal as a continuation of that main crystal. It is a multiple scepter crystal.

**Faden Growth:** These crystals form in cracks that slowly widen. The crystal is attached to both walls and the crystal breaks but regrows so it is again one crystal. This gives what is called a Faden Line down the center made of liquid and glass inclusions.

**Gwindel Growth:** This crystal looks like it has grown sideways to form a platy or flat crystal shape. It is not straight but twisted and bent. The growth rotates around an axis either right handed or left handed.

**Interference in Growth:** Sometimes the crystal runs out of room to grow or crystals of other minerals get in the way of a quartz crystal growth. Sometimes these other minerals dissolve away and leave what looks like pitting on the quartz crystal.

**Needle Growth:** These crystals are very elongated and narrow like a needle.

**Crystal Perimorph:** In this instance one mineral grows and then is covered by quartz. The first mineral then dissolves and leaves its shape in the quartz.

**Phantom Growth:** A quartz crystal grows, then stops, another type of mineral growth covers all or part of the quartz crystal and then the quartz begins to grow again. When you look at the crystal the other mineral outlines the inner crystal.

**Pseudomorph Growth:** This growth occurs when one crystal replaces another but keeps the shape of the first. The quartz fills in a cavity where another mineral dissolves out. In this image on the right is a gypsum rose. On the left is a pseudomorph of quartz after selenite taking that same shape.

**Rainbow or Iris Growth:** Cracks sometimes form and the light refracts off of them breaking the light like a prism. In another form it seems like Brazil Twin layers cause the prism effect.

**Scepter Growth:** When a second quartz crystal grows on top of the original and is larger than (or smaller, or offset from) the lower crystal it takes the shape of a scepter. This second crystal is an outgrowth of the first crystal. There can be multiple stack scepters.

**Skeletal Growth:** When the edges grow faster than the faces then you have skeleton quartz. The edges stick out like the frame on a picture. These growth forms seem to be caused by rapid falling pressures and temperatures.

**Star Growth:** Small, equal sized crystals sometimes grow outward from a common center forming spheres that are star shaped. Of course as with all things in nature, there are many combinations of the above growth patterns that can yield more interesting shapes. Then you throw in the effects of changes in temperature, pressure, and chemistry while the crystal is growing can lead to all kinds of fantastic and wonderful possibilities.

Please visit the website [www.quartzpage.de](http://www.quartzpage.de) to see many more examples and other forms.

Information summarized from the website [www.quartzpage.de](http://www.quartzpage.de)

*From CMSe Tumbler 10/12, via Clackamette Gem, 9/12, via The Council Reporter, 10/12, via the WGMS Rockhounder Mar 2017*

## How Do You Know If A Geode Is Hollow Without Opening It?

Everyone knows what a geode is, a spherical rock with a hidden hollow inside usually encrusted with some type of crystals. Here's the caveat though, how do we know if the cavity inside is large or small, that it has lots crystals of just few. Most experienced geode breakers knew a simple "rule of thumb," if one geode of other geodes of the same size weighs less than the others then the lighter one probably had a larger hollow center, thus able to hold more crystals. Well there is a more definitive and mathematical way for calculating whether one geode is more hollow than another. This way is based on the density of quartz. Forgoing all the deep math to calculate the density of quartz, we'll just plug in the numbers and put forth this simple formula.

Weight (if solid) in pounds (lb) =  $0.401 \times r^3$  where  $r$  is the outside radius of the geode in inches. As you remember from high school geometry  $r$  is one-half the diameter and the little 3 above and to the right of the  $r$  is an exponent which means you multiply  $r$  by itself 3 times! (Didn't you love geometry and algebra?). So if a geode weighs less than it should by this formula, then it has a hole inside. The greater the weight difference the bigger the hole inside should be!

So here it is:

$$\text{Weight (if solid)} = 0.401 \times r^3$$

So lets' try it out. Lets' take a geode with a diameter of 8 inches and plug it into our formula.

First if the diameter is 8 inches then the radius ( $r$ ) is 8 divided by 2 ( $8/2$ ) or 4 inches.

Now we can plug our numbers into the formula.

$$\text{Weight} = 0.401 \times 4^3 = 0.401 \times (4 \times 4 \times 4) = 0.401 \times 64 = 24.664\text{lbs}$$

Any geode weighing considerably less would have a greater hollow inside.

So the next time you step up to the geode seller have your scale and calculator ready and get the best geode money can buy.

Good Luck.

Somewhere out there the great hollow geode filled with crystals is waiting for you.

### GEODE WEIGHT CHART FOR QUARTZ

(solid wt. =  $0.401 \times r^3$ )

#### GEODE DIAMETER WEIGHT IF SOLID

3.00 in	1.35 lbs
3.50 in	2.15 lbs
4.00 in	3.21 lbs
4.50 in	4.57 lbs
5.00 in	6.27 lbs
5.50 in	8.34 lbs
6.00 in	10.83 lbs
6.50 in	13.77 lbs
7.00 in	17.20 lbs
7.50 in	21.15 lbs
8.00 in	25.66 lbs
8.50 in	30.80 lbs
9.00 in	36.50 lbs
9.50 in	43.00 lbs
10.00 in	50.12 lbs

## A LITTLE ABOUT LIMESTONES By Beth Simmons

As taken from Frederic Brewster Loomis' book, "Field Book of Common Rocks and Minerals," published in 1923 by G. P. Putnam's, pages 212-215 and plates 59 & 60.

We all recognize limestone; it's the rock that fizzes! Limestone ( $\text{CaCO}_3$ ) is very useful stuff—it makes a fine building stone, although prone to dissolution; it is used as a flux in smelting and in preparing sugar from beets; it is the basis of cement; and is that round leather-cleaning ball I showed last year. Limestone forms through the action of carbonate fixing organisms—from mega seashells to microbes; even calcareous-fixing algae that live in fresh-water lakes contribute.

Crushed limestone can be heated in a kiln to about  $900^\circ\text{C}$ . The carbon dioxide in the rock goes off as a gas, and leaves calcium oxide, lime. When lime is mixed with water, it makes calcium hydroxide, or slaked lime. Mix slaked lime with sand to give it body, and you've made mortar. When exposed to the air, the slaked lime gives up water, and takes back carbon dioxide from the air, and becomes calcium carbonate with its original hardness (of 3). There were tremendous limestone deposits along the Front Range—the first layers to be mined out were the Forelle and Glennon Limestones in Mount Vernon Valley used not only for lime, but also for building stone as early as 1859. The Soda Lakes at Bear Creek Lake Park were old limestone quarries mined out in the late 1800s for smelting flux. Present Portland cement limestone quarries operate at Florence and north of Boulder.

Limestones are distinguished according to their mode of origin.

**1. Bog lime** - white calcareous powdery deposit made by calcareous-fixing algae on the bottom of fresh-water ponds. Occurs along the Front Range in the Morrison Formation. Microscopic algal balls, gyrogonites of charophytes (female egg containers of stone-worts), have been used to correlate outcrops of the Morrison Formation in Colorado, Wyoming, and Utah.

**2. Coquina** - formed from the loose consolidation of shells and shell fragments. The coquina used in Castillo de San Marcos, St. Augustine, Florida, built in 1672, was so porous, it absorbed cannon balls!

**3. Chalk** - soft, fine-grained limestone, formed by the accumulation of foraminifera shells in shallow, warm tropical seas, presently in Florida Bay as foraminifera ooze. Widespread deposits of the "Niobrara Chalk" cover most of the Midwest; the limestone ball used for cleaning leather is "Niobrara chalk." The famous White Cliffs of Dover are chalk. Often there will be flint nodules within the chalk layers, globs of silica radiolarian ooze that hardened after it dropped into the foraminiferal ooze. Chalk is much nicer in texture than the original foraminiferal ooze, which is slimy and gooey, full of little shards of shells; I report from personal experience of jumping off a boat into Florida Bay.

**4. Coral Rock** - made by the cementation of fragments of corals. The "Dolomite Mountains" in Tyrol are made of ancient coralline deposits. Many Silurian and Devonian limestones contain huge coral heads such as the Petoskey Stones of Michigan.

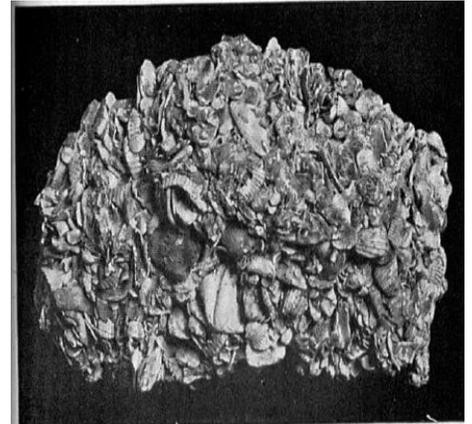
**5. Encrinal Limestone** - limestone full of the fragments of crinoid skeletons. Crinoidal limestones occur throughout the eastern Midwest.

**6. Hydraulic limestone** - fine-grained, compact, yellowish limestone with 13-17% sand and some clay; can be burned at a higher temperature than normal limestone, will create a cement that sets under water, like Portland Cement. In places this describes the "Niobrara limestone."

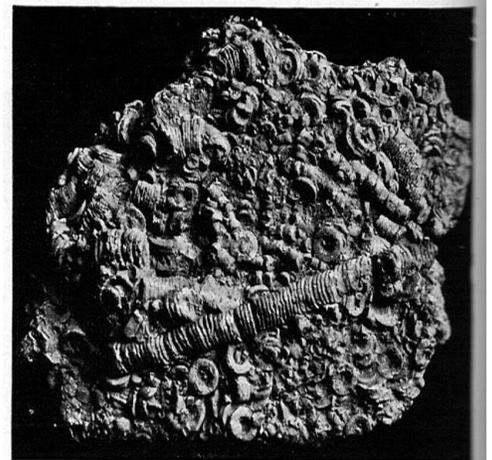
**7. Lithographic Limestone** - very fine-grained compact, limestone, with clay impurities which make it usable for a historical printing process. Figures are drawn in reverse on this limestone with a special crayon. Then the slab was treated with acid, and those parts which were not protected by the drawing were etched away, while the points protected by the drawing remained in low relief. The figures were then inked and pressed onto paper, creating the printing. I show a piece of lithographic limestone from a printing shop back in Pennsylvania.

**8. Travertine** - general name applied to calcareous deposits from fresh water lakes or streams, precipitated as a result of cooling or evaporation. They can be stick-like algal deposits and occur around Rifle Cave and Jewel Cave in South Dakota. Porous travertine is called "tufa" or "calc sinter." They are common, of course, at Yellowstone.

**9. Onyx marble** - dense travertine formed in the deposition of lime from spring water or underground cave deposits. Often banded from impurities in the water, they are common throughout Mexico where they are carved into figurines and household ornaments.



Coquina



Encrinal Limestone; fragments of the stems, arms and body of Crinoids

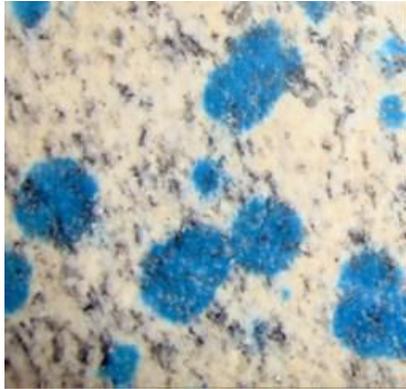
## “K2-Blue”

by Anastasia Chaparro

**K 2-Blue** is found at the base of K2 in the area of Gilgit-Baltistan at an altitude of about 15,000ft. It is a unique and rather rare occurrence. Azurite and Malachite are almost chemically identical.

Azurite's Formula is:  $Cu_3(CO_3)_2(OH)_2$ , Malachite's Formula:  $Cu_2(CO_3)(OH)_2$ . If it were not for the elevation and environment in which K2 was created, there would probably be green malachite balls inside of the matrix instead of blue azurite. This particular formation of azurite is needle like and forms ball like aggregates which lends to unique cutting of rough. No matter which angle you slice it at you will come out with perfect little balls in a 360 circle because these azurite balls are 3 dimensional.

Azurite often forms with malachite however due to the altitude in which k2 blue is formed, the copper does not oxidize as much, which is a rarity in itself. Yet, I have seen it included with light green balls which probably means that it was



mined at a lower elevation where there was more water available to mix with the oxygen to allow oxidization. Water holds less oxygen at low barometric pressure (high altitude), therefore the azurite stays blue. Azurite holds less water in it than malachite so the copper in malachite will oxidize faster. This explains the color changes and why they are usually found together. The oxidization of azurite actually changes it into malachite. If K2-Blue were formed at a lower altitude it would change colors and chemical composition.

The azurite floats permanently suspended in albite and quartz. The strontium is grey and turns a (very faint) yellowish brown color when it hits the air which leaves an unusual warm colored matrix with a cool colored blue in its midst. The circumstance of its formation has lent it some very unique and beautiful qualities. It also contains titanium which show as tiny

sparkly flakes flashing in the light, surrounded by darker flecks of chromium and manganese which polishes easily and is surprisingly easy to cab. Especially if you are used to working with harder crystals.

When it was first analyzed, the tests showed that it was ALBITE, Quartz/Microcline. When further tests were completed, it was determined that K2-Blue consisted of Blue Orbs of Azurite, with Manganese, Titanium, Strontium, and Chromium, as Secondary Minerals of Concentration. These tests were ordered by Gary Andruss who is a rockhound adventurer, however the website now states that you can order directly from Pakistan instead of through him.

The website is: <http://k2blue.com/>

In the pictures of the rough, note that it has not been polished in any way, and there are examples of cross sections to show the 360 degree azurite balls at different cutting angles. I have also added pictures of finished cabs to show the shine.

