The Lake George Gem and Mineral Club -

Club News, May, 2009

Meeting Time 8:45 AM, May 9 at Lake George Community Center. *Best wishes for a speedy recovery to our President and his wife, both of whom recently underwent surgery!*

Our field-trip leader, **Dan Alfrey**, has organized ***two trips*** for May 9:

Trip 1. A guided tour by Mr. Ed. Hunter, covering Victor-area mines, mill sites, etc., for our Victor GeoStudy Project. This trip is limited to Steve Veatch and Dan (drivers) and Ed (guide) plus 11 members. We will offer this to Victor Study Group members **FIRST**, and then open it to other Club members. ***At 9:15 sharp!***, we will take 2 vehicles from the Community Center to conduct a driving tour of the Victor area. We will use walkie-talkies and log miles to create a Driving Guide that the Victor Museum can sell to raise a few dollars. **Those interested MUST contact co-chair Dan Alfrey** (alfreydan@aol.com). Snacks and pop provided; bring a sack lunch.

Trip 2. John and Laurie Casto (CSMS club claim managers) have graciously invited us to the April Fools claim in the Crystal Creek mining district. This is near the GodSend and ForeverMine area, and **Joe Dorris** was very instrumental in making this happen for the CSMS! Bring your tools, water, sun screen, camera, and snacks and collect smoky quartz and awesome-colored amazonite! ***Meet at 9:20 sharp!*** At the wide-spot in the road just past the USFS Work Station (on the Left). **Sign up before the meeting and be ready to go!**

Dan suggests that you get to the meeting a little early—we'll have a short business meeting and should be ready to go when that's finished.

Reminder: It's springtime in the Rockies, and in the event of adverse weather or dangerous road conditions, we will cancel the meeting. Be sure to dress for nearly any kind of weather. Watch for email notice of cancellation or call one of the Officers.

Coming Events

Denver Gem & Mineral Guild Auction, Colorado School of Mines, Rm. 108 Berthoud Hall, Golden, 7:30PM	…	**May 8**
62nd Annual Grand Junction Gem & Mineral Show, Two Rivers Convention Center, 1st and Main Sts, Grand Jct. (call Brent Jensen, 970-245-5595 for info)	…	**May 9-10**
Colorado Springs Mineralogical Society Monthly Meeting, "The Illusive (sic?) Gold of Antelope Springs", by Lauren Lowe, 7:30PM, Colorado Springs Senior Center, 1514 N. Hancock Blvd.	…	**May 14**
Columbine Gem & Mineral Society Monthly Meeting, 6:30PM, Mt. Shavano Manor, 525 W. 16th St., Salida.	…	**May 14**

Colorado Chapter Friends of Mineralogy Silent Auction (rescheduled), Clements Community Center, 1580 Yarrow St., Lakewood. Call Larry Havens, 303-757-6577. … **May 16**

Cheyenne (WY) Mineral & Gem Show; contact Donna Durako at 307-634-4229 or bluebarite1@bresnan.net for information. … **May 16-17**

Colorado Mineral Exploration Seminar, Western Museum of Mining and Industry; cost is $15. Call 719-488-0880 to register; can be used for 0.5 hr. grad. Credit at CSM (tuition extra). … **May 16-17**

Rocky Mountain Micromineral Association, monthly meeting, Colorado School of Mines Mineral Museum, Golden, 2PM. (Contact Richard Parsons at Richard.parsons@worldnet.att.net for info) … **May 17**

"**Exhibiting and Judging Seminar"**, by Jordan Sawdo, (rescheduled) 10AM-3:30PM, Adams Co. Museum, 9601 Henderson Rd. (Adams Co. Fairgrounds); confirm attendance at jordanruth@msn.com; call 303-452-7792 with questions … **May 23**

Wigwam Claim Field Trip with Denver Gem & Mineral Guild (contact Dan Alfrey, alfreydan@aol.com for details) … **June 6**

International Gem & Jewelry Show, Denver Merchandise Mart, 451 E. 58th Ave., admission $7.00; info at 301-294-1640. … **June 12-14**

Cave of the Winds GeoAdventure, Pillar Institute of Lifelong Learning and Steve Veatch; cost TBD. Call 719-633-4991 to register. … **June 19**

"The Fossil Record: an Introduction to Paleontology", Cripple Creek Parks & Recreation, cost $69; call 719-689-3514. Cost includes 2 field trips; can be used for 0.5 hr grad. credit at CSM (tuition extra). … **June 20**

Colorado Springs Mineralogical Society "Rock Fair", at Western Museum of Mining and Industry, contact Yam Yamiolkowski at 719-488-5526 or Ron.Yamiolkowski@aecom.com … **June 20**

Garden of the Gods and Red Rocks Open Space, Friends of the Florissant Fossil Beds Summer Seminar Series, cost TBD. Call 719-748-1156 to register; can be used for 0.5 hrs. grad. Credit at Adams State College (tuition extra). … **June 27**

"Cruisin the Fossil Freeway" lecture by author Kirk Johnson and illustrator Ray Troll, Denver Botanic Gardens, Mitchell Hall, $10 donation (see Denver Botanic Gardens website for details) … **July 1**

Lake George Gem & Mineral Club field trip to Rich Fretterd's Petra Placer … **July 11**

Dinosaur Ridge Class, Steve Veatch and others, Cripple Creek Parks & Recreation, cost is $33, including transportation. Call 719-689-3514 for information. … **July 11**

Contin-Tail Rock and Gem Show, Buena Vista Rodeo Grounds (free admission) … **Aug. 6-9**

Lake George Gem & Mineral Club Annual Show, U.S. Highway 24 (next to Post Office), Lake George (free admission) … **Aug. 14-6**

"The History of Scientific Discovery at Florissant Fossil Beds N.M." by Dr. Herb Meyer and Steve Veatch, Friends Summer Seminar Series; cost TBD. Call 719-748-1156 to register. Can be used for 0.5 hrs. grad. Credit at Adam State College (tuition extra). … **Aug. 23**

Colorado Mineral & Fossil Show (Fall), Holiday Inn, 4849 Bannock St., Denver (free admission); info at MartinZinnExpositions … **Sept. 16-20**

Denver Coliseum Mineral, Fossil, Gem, & Jewelry Show, Denver Coliseum, 4600 Humboldt St.; $3/$2 admission; info from Lowell Carhart, 719-886-7046. … **Sept. 16-20**

Bead Renaissance Show, Crown Plaza, 15,500 E. 40th Ave., Denver; call 575-894- … **Sept. 17-20**

1293 for info.

42nd Annual Denver Gem & Mineral Show: "Fossils—Windows to the Past" ⋯ **Sept. 18-20**
Denver Merchandise Mart Expo Hall, 451 E. 58th Ave. (I-25 exit 215); $6/$4 admission.

Colorado Fossil Expo, Denver Merchandise Mart Plaza Annex, 451 E. 58th Ave.; $6/$4.50 admission; info at MartinZinnExpositions. ⋯ **Sept. 18-20**

Field Studies in Paleontology: Exploring the Shelf Road from Cripple Creek to Garden Park, Colorado, Cripple Creek Parks & Recreation; cost is $69. Call 719-689-3514 to register. Can be used for 0.5 hr. grad. Credit at CSM (tuition extra). ⋯ **October 3**

46th Annual Pikes Peak Gem & Mineral Show, Phil Long Expo Center, Colorado Springs, contact Rick Copeland, 719-332-7915 or rick@rockymountainwonders.com ⋯ **Dec. 5-6**

Club News

About 30 members gathered in Lake George at the April meeting. At a short business meeting, **Dick Lackman** volunteered to help with publicity for the August show. **Dee Loest** reported that tee-shirt prices will depend on how many people order them from her by the May meeting. **Mary O'Donnell** is looking for a volunteer to help with the club history. **Dan Alfrey** and **Steve Veatch** provided an update on the Victor Project. Several field trips are planned (see below), and the group needs to move fast to have a presentation ready for Victor Gold Rush Days (in late July). Let Steve know if you want to help out.

Field-trip Chairman **Dan Alfrey** noted that he has a new assistant, **Todd Mattson**. Dan reported that the Club claim is on the "back burner" for now & so is the FaceBook idea. Future trips include a visit to the Red Rocks Canyon Open Space to see dinosaur track and petrified wood; a Guffey region trip; and others (see below).

President **John Rakowski** reminded members of the May 16-17 Mineral Exploration Seminar at Western Museum of Mining and Industry. The seminar has received rave reviews in the past. John also reported to the Editor that the Red and Green Mineral Shop, in Lakewood, is for sale. If any of you are aching to own a retirement business or just always wanted to own a rock shop, this well established mineral business can be yours. Call 303-929-6714 for info.

Townsend and Frankie Wolfe gave a short presentation on their ForeverMine claim. They showed off some really nice transparent smoky quartz crystals as well as clear/colorless quartz and big microcline crystals from the claim. Then, despite threatening weather, many members took advantage of the Wolfes' invitation to collect on the claim. In an e-mail to Dan, Frankie reported that **Todd Matson** found some beautiful, lustrous, euhedral, dark blue-green amazonites, some in clusters with smokies. Other (unidentified) collectors found a 6-inch, 3-point cathedral smoky quartz crystal and small, very clear smokies. Todd reported that he saw a goethite/onegite with smoky quartz "mini cluster". It sounds like everybody came away with some "keepers".

Field Trips/Victor Study Group

Dan Alfrey has scheduled some field trips and meetings of the Victor Study Group, as listed below:

- **Victor Study Group** will meet at the Lost Dutchman Conference Center **May 12,** 6:00-7:30; **June 9**, 5:30-7:30, and **June 23**, 5:30-7:30. Space is limited; please contact Dan if you plan to attend any or all of these meetings.
- **May 23:** Club field trip and picnic in the Guffey area
- **June 6:** Wigwam claim field trip with the Denver Gem & Mineral Guild

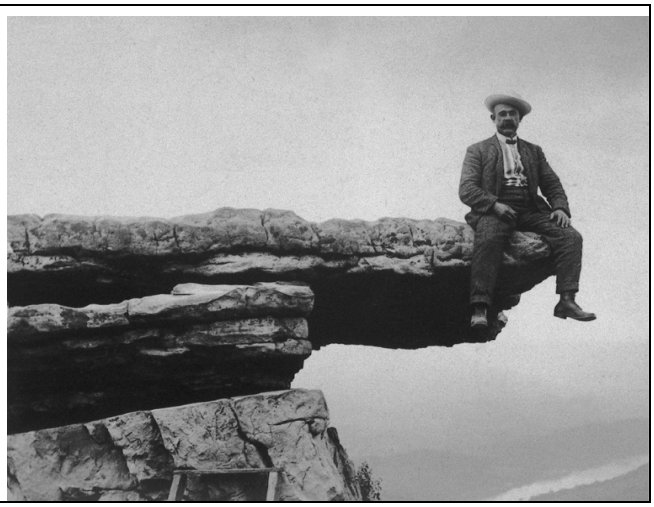
- **June 13:** Trip to an active gold mine at Alma; Dan needs a **head count by May 29**
- **July 11:** PetraPlacer trip
- **August 8:** LGGMC Show set-up and pizza party
- **August 29:** Glen Cove inter-club field trip (with DGMG and CSMS) for smoky quartz and topaz (Fee required – Group Rate available)

Notes from the Editor

Bob Carnein, Editor

ccarnein@lhup.edu

719-687-2739



If you haven't paid your 2009 dues, this is your last newsletter. Please use the membership application attached.

I hope you all enjoy the following 2 articles, one by "yours truly" and the other by Steve Veatch. Remember, if any of you have general or specific questions about minerals, fossils, or anything else of interest, send them in. We have many talented members who could be prevailed upon to write a short article. Also, **please let me know if the newsletter stresses your computer connection.** I'm slowly increasing the amount of content until somebody complains.

Why Are There So Many Big Crystals Around Crystal Peak?

by Bob Carnein

Introduction. The Crystal Peak area's fame rests on its spectacular specimens of amazonite, smoky quartz, and at least 45 other primary and secondary minerals. Most LGGMC members have seen the 4-foot, 439-pound smoky quartz/microcline specimen in the Pikes Peak Historical Society Museum in Florissant, and smoky quartz-amazonite combos from the Lake George area grace mineral collections all over the world. Have you ever wondered why the local Pikes Peak Granite hosts such an abundance of big, euhedral* crystals?

Many readers have no doubt heard that the Pikes Peak Granite locally contains "pockets" of crystals. The technical term for the kinds of pockets in the Crystal Peak area is ***miarolitic cavities***. Thousands of these openings have been excavated since they were discovered in the 1860s. Sizes range from a few mm to several meters in maximum dimension. The smallest cavities generally retain their open spaces from the time they formed, about a billion years ago. However, the largest have mostly collapsed, as a result of fracturing that occurred either shortly after they formed or later, due to tectonic activity or to

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*The terms ***euhedral, subhedral, and anhedral*** refer to the degree to which crystal faces are developed. If a crystal is completely enclosed by faces, it is euhedral. If partially enclosed in faces, it's subhedral. Anhedral crystals have no flat faces.

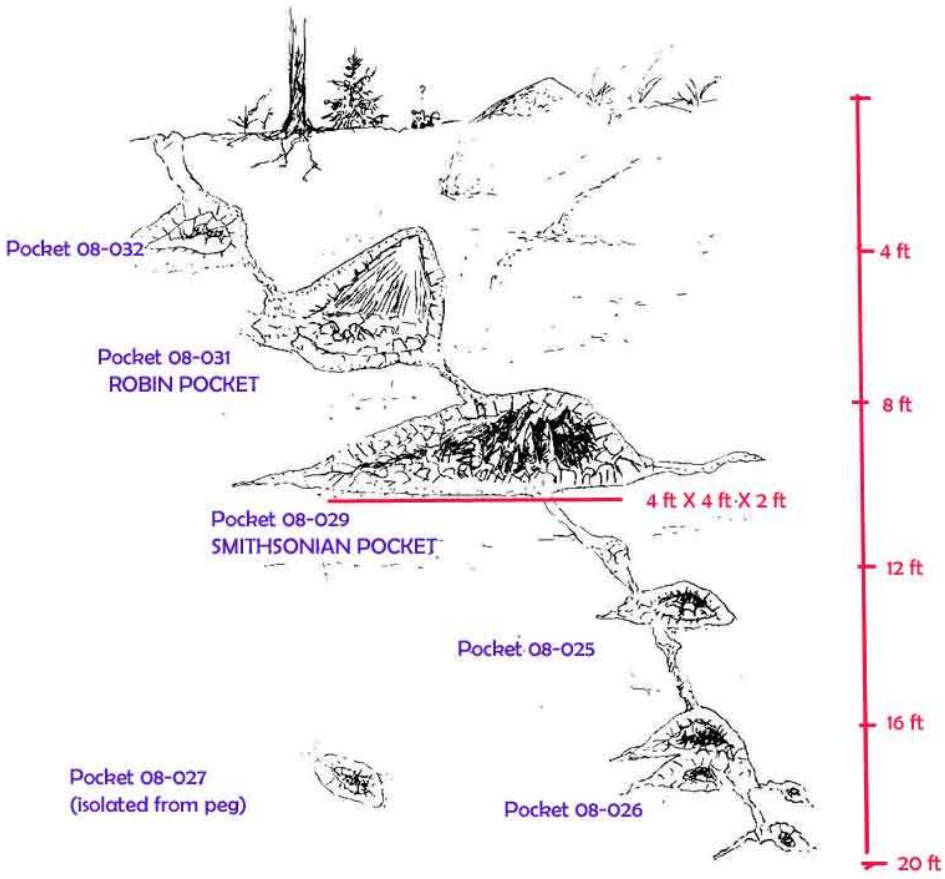

Figure 1. Pegmatite pockets, Smoky Hawk claim, Crystal Peak area. Copyright Joseph L. Dorris, Glacier Peak Mining, LLC.

freezing and thawing and root action when they were exposed to weathering. Although their shapes vary widely and often must be reconstructed, many of the larger openings have been described as having cross sections like a mushroom cap, with flat floors and domed tops (Fig. 1). These may be localized in more extensive pegmatite bodies, most of which are horizontal or dip gently. They often are filled with red, montmorillonite-rich clay, and the larger crystals that have broken loose from the tops of the cavities commonly accumulate in the mud overlying crystals of the cavity floors. The pockets may be lined by "*graphic granite*" (Fig. 2) or *aplitic granite*. Graphic granite is a coarse, oriented intergrowth of quartz and K-feldspar (microcline) that resembles ancient cuneiform writing. Aplitic granite is a uniformly fine grained rock of granitic composition in which the mineral grains are anhedral*. Both of these textures are typically associated with granite pegmatites.

Figure 2. Typical "graphic granite", an intergrowth of quartz (dark gray) and K-feldspar (tan).

Figure 3. Porphyritic texture, in which euhedral feldspar phenocrysts are surrounded by finer-grained material.

Why are the crystals euhedral? Euhedral crystals can form in many ways. In metamorphic rocks, heat and pressure sometimes allow crystals of minerals such as garnet and staurolite to "shove aside" other minerals as they grow. Generally, the crystals that do the shoving have more compact structures than the minerals that are squeezed aside. In other cases, euhedral crystals are often attributed to growth in "empty spaces".

It would be very unusual to find crystals whose euhedralism resulted from growth in a truly empty space. Even snow crystals form in a space containing air and water vapor. Fluids, however, offer little resistance to the growth of well developed crystal faces. Many igneous rocks (e.g. granite, basalt) contain feldspar grains, with at least partially developed flat crystal faces, that are completely embedded in a matrix of anhedral crystals (Fig. 3). These euhedral to subhedral crystals formed at a time when they were surrounded by magma, which allowed them to grow freely with minimal interference from other growing crystals. The later crystals filled in the spaces between the earlier, euhedral ones as the magma cooled. Sometimes, the earlier crystals are significantly larger than the later ones, and are called ***phenocrysts*** (feen'-oh-crists) (Fig. 3). Occasionally, such phenocrysts may weather out of the host rock and accumulate where rockhounds can pick them up, as shown by the famous potash-feldspar crystals from the Lincoln porphyry, near Climax. Thus, the order of crystallization can be a critical factor in explaining some euhedral crystals. However, the crystals in the Crystal Peak area clearly aren't phenocrysts.

So, what was in the pockets that host the amazonite/smoky quartz specimens of the Crystal Peak-area? The best bet is hot, chemically active, water-rich fluids that started out dissolved in the Pikes Peak Granite magma. As an analogy, think of carbon dioxide dissolved in a can of Dr. Pepper or Moose Drool. As long as you keep the pressure on the beer, the CO_2 is invisible—it's dissolved in the liquid. Similarly, in the Pikes Peak Granite, water derived from deep underground or picked up as the granite ascended through the crust stayed dissolved in the magma as long as it was deeply buried, where the pressure "kept the lid on". As the magma worked its way upward, it cooled, and parts of it crystallized. Quartz, feldspars, and biotite, the main ingredients of the granite, don't take up much water as they solidify, so the residual magma became progressively richer in water as it ascended. Eventually, the reduced pressure, possibly aided by formation of fractures, allowed the water to separate. This could only happen relatively close to the Earth's surface. In the case of the Pikes Peak intrusive bodies, separation of water-rich "bubbles" probably occurred within less than 5 km of the surface, at temperatures below about 550˚C (amazonite loses its color if heated to between 300 and 400˚C, and microcline, which is the mineral name for amazonite, is unstable at high temperatures in the presence of water).

Why are the crystals so large? Sudden reductions of temperature and pressure as the water-rich magma shot into fractures triggered abundant nucleation of the dissolved quartz and feldspar in the fluid. This generated aplitic granite—lots of little crystals formed so quickly that no faces developed. If the aplite sealed off the fractures or openings, or if crystallization occurred in an isolated cavity, slow nucleation, combined with rapid migration of ions in the hot, aqueous fluid, produced fast growth of a

relatively small number of large crystals. This resulted in a pegmatitic texture, where mineral grains average more than 3 cm across. If most of the dissolved material is used up before the pocket fills with crystals, then euhedral crystals line the walls, as in the Crystal Peak area.

Notice the paradox here! You probably learned in a basic geology course that large crystals result from slow growth. In pegmatites, the opposite is true. The presence of abundant water in magma decreases its viscosity, allowing rapid migration of dissolved ions to the faces of growing crystals. As a result, some pegmatites contain huge crystals weighing many tons that probably formed in a matter of hours, days, or weeks. On the other hand, water-poor, silica-rich magmas are so viscous that formation of large crystals takes place very slowly.

Hydrothermal deposits. So, where did the water go? It can't be taken up by crystallization of the minerals in the gem pockets. As the rock cooled off, fractures formed, allowing the residual water to drain out of the pockets, carrying with it whatever dissolved ions could not crystallize under the temperature and pressure conditions in the pocket. Such fluids, the final residue of the granite magma, become the sources of *hydrothermal deposits* found in many granites or surrounding rocks. In some cases, the resulting exotic minerals, concentrated from the original magma or from interaction with the host rocks, form some of the most economically and scientifically important deposits on Earth. In the case of the Pikes Peak Granite, most of them probably were eroded off the top of the intrusive complex hundreds of millions of years ago.

Figure 4. Nighthawk pocket, Smoky Hawk mine. Copyright Joseph L. Dorris, Glacier Peak Mining, LLC.

Figure 5. Specimen from Upper Forty pocket, Smoky Hawk mine. Copyright Joseph L. Dorris, Glacier Peak Mining, LLC.

Blue John Stone:
A Remarkable Fluorite from a Limestone Cavern
By Steven Wade Veatch

Blue John Stone is the name given to banded fluorite found in the Castleton area of Derbyshire in England (Ollernshaw, 1964). Blue John Stone has been prized for centuries. Chemically, it is a calcium fluoride (CaF_2) and occurs in distinct bands of different colors: blue, white, purple, and yellow. The color banding is thought to be from periodic changes in the composition of the mineralizing solution and the physical conditions during its formation (Mackenzie and Green, 1971). The name of this distinctive material is thought to have come from the French "*bleu et jaune*," referring to the blue and yellow that describes its color.

Blue John Stone is mined from only two places—Treak Cliff Cavern and Blue John Cavern in Castleton. Blue John occurs either in veins up to 3 inches thick or as nodules in a limestone unit found inside natural caverns beneath a hill west of Castleton. The caverns are now tourist attractions where visitors can go on underground tours (British Council, 2008).

Located in limestone deep within the Treak Cliff and Blue John Caverns, the Blue John Stone has been mined for its beautiful colors for centuries. (S. Veatch specimen, photo by S. Veatch.

Castleton is an excellent example of an ideal English village. A beautiful stream quietly flows through this picturesque community of quaint tea shops, inviting pubs, charming cottages, and old stone houses. Peveril Castle is a short walk up the hillside from Castleton.

The Blue John stone was first discovered about 2,000 years ago when the Romans mined lead and other ores in the caverns of Castleton. The Romans valued the beauty of the Blue John stone and mined it for use in ornamentation. Two vases made of the stone were unearthed during archaeological excavations at Pompeii. Blue John Stone artifacts have been found at other ancient Roman sites. There are several references to the stone in Roman literature. Blue John Stone was in demand in the 18th and 19th century for ornamental vases and columns used in some of the finest houses in Britain.

Today the larger Blue John veins are largely mined out and the material is now scarce—only a few hundred pounds are mined each year for specimens, ornamental pieces, and for jewelry sold in Castleton shops.

References Cited:

British Council, 2008. *"Going down the mine."* British Council Web site: Retrieved March 21, 2009, from http://www.britishcouncil.org/learnenglish-holiday-countryside-peaceful.htm

Mackenzie, K.J.D. and Green, J.M. 1971. *The cause of Color in Derbyshire Blue John banded fluorite and other blue banded fluorites*. Mineralogical Magazine, December 1971, vol. 38, pp. 459-470.

Ollernshaw, A. E. 1964. The *history of Blue John stone; methods of mining and working, ancient and modern*. Published Castleton via Sheffield , 23 p.

Lake George Gem and Mineral Club
Box 171
Lake George, Colorado 80827

2009 MEMBERSHIP APPLICATION

Name(s) _____

Address _____City _____State __ Zip _____

Telephone ( ) _____-_____ E-mail _____

Names and ages of dependent members: _____
_____

Annual membership - dues Jan. 1 through Dec. 31 are as follows:

- Individual (18 and over) …….. $15.00
- Family (Parents plus dependents under age 18) …….. $25.00

Annual dues are due on or before March 31. Members with unpaid dues will be dropped from the roster after this date. **Anyone joining after August 30 shall pay one half the annual dues.**

I hereby agree to abide by the constitution and by-laws of this club.

Signed _____ Date: ____/____/____

I have previously been a member of Lake George Gem & Mineral Club. Yes __ No ___

My interest areas include:
Minerals __ Fossils__ Lapidary __ Micromounts __
Other _____

I would be willing to demonstrate any of the above for a club program or educational activity? If yes, which: _____

Please indicate which of the following activities you might be willing to help with:

Writing _____ Editor _____ Mailing _____ Local shows _____

Club Officer _____ Programs _____ Field trips _____ Refreshments _____

Questions about the club or club activities? Contact John Rakowski (719) 748-3861

Lake George Gem and Mineral Club
P.O. Box 171
Lake George, CO 80827

The Lake George Gem and Mineral Club is a group of people interested in rocks and minerals, fossils, geography and history of the Pikes Peak/South Park area, Indian artifacts and the great outdoors. The club's informational programs and field trips provide an opportunity to learn about earth sciences, rocks and minerals, lapidary work and jewelry making, and to share information and experiences with other members. Guests are welcome to attend, to see what we are about!

The club is geared primarily to amateur collectors and artisans, with programs of interest both to beginners and serious amateurs. The club meets the second Saturday of each month at the Lake George Community Center, located on the north side of US Highway 24 on the east edge of town, sharing a building with the county highway shops. **In the winter we meet at 10:00 AM. From April through September, we meet at 9:00 AM, to allow more time for our field trips.**

Our organization is incorporated under Colorado law as a nonprofit educational organization, and is a member of the Colorado, Rocky Mountain and American Federations of Mineralogical Societies. We also sponsor an annual Gem and Mineral show at Lake George, where collectors and others may purchase or sell rocks, minerals, fossils, gems or jewelry. Annual membership dues (Jan. 1 through Dec. 31) are $15.00 for an individual (18 and over), and $25.00 for a family (Parents plus dependents under age 18).

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