# Exploring a topaz-bearing Pikes Peak pegmatite

**Richard Fretterd and Jean Cowman**
*Woodland Park, CO, richardfretterd@peoplepc.com, jeancowman@peakinter.net*

**The Hunt for Topaz**

Rich has spent many years researching and chasing minerals in Colorado's Front Range. Books, maps and stories both old and new have been a constant source of information and inspiration for pursuing new targets. One winter evening Rich was browsing through the "Minerals of Colorado" by Edwin B. Eckel (1997). He turned to his favorite section on topaz and read through the county listings of known topaz locations. Under the El Paso county heading, he was intrigued to read of a brief description of "magnificent pink two inch topaz crystals" found by Edwin Over Jr. somewhere near Cameron's Cone and Crystal Park some sixty years earlier. The information of course was not new and as Rich learned, many other local mineral hunters had attempted to locate the source of the topaz during the intervening decades.

Undeterred, Rich set his sights on finding the original source of the material. Starting in the summer of 2010, Rich spent much of his spare time hiking the hills west of Colorado Springs. Numerous old digs were located that showed amazonite fragments but no confirmed topaz was evident at any of the sites. In the summer of 2012 Rich was contacted by an old friend who had previously hiked the area. Rich mentioned his search for the topaz location and the friend stated that he had found a shard of a pink gem less than a quarter mile from the current search area some forty years prior. What providential timing to hear such details from an old friend!

With renewed excitement the search continued. Mining partner Jean Cowman accompanied Rich on most of his hikes to the area. On one particular hike, Rich found exposed pegmatite material near the top of a ridge and discovered a smoky quartz pocket in the rocks. Jean made it a habit to stay in radio contact and prospect a little further away from Rich in order to search a larger area. (Prospecting right beside Rich can be a little frustrating as he usually sees everything first!) Whenever either partner found anything of interest they would radio the other to check it out. So taking a different route, Jean circled to the valley floor below. Hiking back up the bottom of the valley toward Rich revealed several stringers of white quartz that had eroded down the slopes from above. Near the upper end of the valley, Jean located the largest of these quartz trails of "float" and began to follow the quartz uphill. The trail ended at a relatively small outcrop of white quartz that protruded about 18 inches (46 cm) above the granite scree slope. No quartz crystal faces were evident near the outcrop but the outcrop itself was dissected by a vertical vein-like structure of pink microcline about 18 inches (46 cm) wide. Jean radioed Rich who hiked down to check out the site. Both agreed that it was one of the most unusual structures on the mostly barren slopes of the search area.

Surface digging adjacent to the outcrop revealed large books of biotite mica up to 6 inches (15 cm) in diameter. Several more hiking trips were made to the site to continue digging. Quartz bordering the microcline vein was well fractured along growth lines and was fairly easy to chisel away. This fractured quartz area produced some small doubly terminated tabular crystals of milky quartz. Rich moved several feet to the side of the outcrop and began digging down while Jean continued excavating the fractured quartz. Approximately 18 inches (46 cm) down into the quartz, more tabular doubly terminated quartz crystals were revealed. These crystals appeared to be more translucent and smoky. The small, flat crystals were stacked like pancakes to a depth of about three inches (8 cm) into a small pocket. Below the crystals was a layer of thick tan clay. Removing the clay with skewer sticks revealed no more quartz crystals. Disappointing. The pocket was small, about the size of a grapefruit.

Jean then scraped the bottom of the pocket with skewer sticks to ensure that there were no more quartz crystals. Several needle sharp terminations were found in the bottom of the pocket. Cleaning the crystals revealed that they were not glassy shards of broken quartz but were in fact topaz! The topaz was etched, peachy pink in color, and mostly double terminated in multiple needle-sharp terminations. Crystals were all smaller than ¾ inch (2 cm) but did resemble the description of the Over topaz found some 60 years prior.

A second pocket of similar size and material was found about one foot (30 cm) downhill from the first pocket. These weren't nearly the size of the topaz crystals documented from the Over find but were the first topaz found within the search area. The chase was on!

Jean continued excavating the quartz outcrop but no more crystals were found. Digging down just off the edge of the main outcrop, Rich eventually began to find oddly shaped quartz crystals. Most were milky and only a few showed complete terminations. He eventually hit a larger pocket of well terminated mostly clear quartz crystals that appeared to be waterworn or had frosted surfaces. Many crystals were doubly terminated and appeared to be Tessin habit (Carnein, 2013), or tapering in size toward the termination. Some crystals had attachments of minute purple fluorite cubes. Others appeared to be clusters of multiple penetrating crystals. This quartz pocket took many

hiking trips to excavate and eventually reached a size of 8 ft x 3 ft x 3 ft (2.5 m x 1 m x 1 m). The sheer size of the pocket was exciting but not a single topaz was found in the pocket.

The small, unusual topaz pockets previously found were inspiration to keep digging. The smaller pockets had a lid of tabular quartz crystals covering a zone containing only clay. Topaz crystals were only found at the bottom of the pocket. What if the much larger quartz pocket discovered by Rich followed the same zoning habit? Could there be topaz located deeper underneath the quartz crystals? There was only one way to find out.

Digging under the floor of the excavated quartz pocket, Rich encountered a horizontal quartz slab. Was this just the floor of the pocket? Persistent thoughts kept encouraging him to explore further. Rich wrestled the slab out of the hole to find some sandy material and another quartz slab below the first one. Rich remembers remarking that "if there's nothing under this second slab, I'm digging someplace else!" With effort, Rich managed to pry the second slab from the floor of the hole. Immediately under the slab was a pristine topaz crystal! The crystal weighed 1½ lbs (680 g) and was 3 inches (7.8 cm) high.

The area beneath the quartz slabs revealed large quantities of loosely packed golden albite, resembling damp sawdust. Removing handfuls of this flakey damp material revealed more topaz crystals. Many crystals were intact with highly etched prism faces or sides of the crystal. They were a peachy pink in color with multiple needle-sharp terminations. One large specimen that was recovered in two pieces revealed very distinct color zoning where the crystal had broken along the cleavage plane. Some crystals were doubly terminated. The largest incomplete crystal, if repaired, would be at least four lbs (1.81 kg) in weight. Over 60 lbs (27 kg) of topaz were recovered from this pocket in one day.

Of note, not a single quartz crystal was found within the main topaz pocket. Rich then referred to the large quartz crystal pocket located above as "the Halo Pocket" because of its location directly above the topaz pocket. Rich then named the lower topaz pocket "the Tribute Pocket" in honor of Edwin Over Jr. and his collecting partners who had found the original referenced topaz decades before.

Further digging revealed smaller topaz pockets along the side walls in a tan clay. The crystals had less surface etching but were still consistently sherry colored. A few colorless or almost colorless crystals were found. Numerous fissures in the granite surrounding the main pocket also contained topaz, microcline and very well formed zinnwaldite crystals up to 5 inches (13 cm) in length. Small areas of blue clay surrounded topaz crystals further away from the main pocket. Analysis of this clay determined that corrensite and nontronite were present (written communication from Bob Carnein, from a sample submitted to Attard XRD Services, November 19, 2013, sample CARN01). Both above and to the edges of the main Tribute Pocket, the walls consisted of larger quartz faces interspersed with microcline and decomposed microcline. Extracting topaz out of the almost solidified decomposed microcline was difficult. Quartz crystal faces extended for a span of almost 20 ft (6 m) horizontally but were left in place to preserve the integrity of the steeper walls of the pit.

This pocket system has some distinct differences from other known topaz localities within Colorado. The sheer size and quantity of the crystals are larger than most local pegmatites known within the Pikes Peak batholith. Preliminary inquiries suggest that the Tribute Pocket is the largest pocket of topaz and has produced the largest gem quality specimen known from Colorado and possibly from North America. (Large rough pieces of topaz have come from other localities but they were not complete crystals and were very heavily included and fractured.)

Also unusual in comparison with other local pegmatites is the very distinct zoning of the quartz and topaz found in this pocket system. Art Montgomery, in the chapter on topaz in his book "Reminiscences of a Mineralogist" (1997) sheds light on some features of this pocket system. He states that "Topaz with its fluorine is one of the typical late stage minerals associated with complex pegmatites. It tends to be associated with other late stage, well crystallized minerals such as platy cleavelandite variety of albite, smoky quartz, black or transparent tourmaline, beryl, an apatite species, lithium bearing lepidolite and spodumene, and columbite." Currently identified minerals from the Tribute Pocket system include clear and smoky quartz, albite, microcline, fluorite, zinnwaldite (biotite mica), columbite and niobium. Since lithium bearing minerals described by Montgomery seem to be absent, it is very unlikely that this system would contain tourmaline or associated minerals. It is suspected that beryllium based minerals such as phenakite or beryl crystals could be associated with this system but not yet encountered in the surface zones. Rich has found both phenakite and blue beryl (rare) at other local pegmatites within a one mile (1.6 km) radius of the Tribute Pocket.

Further digging is needed to continue to expose the borders of the pocket system and to determine what lies below the zone occupied by the topaz. Fluids that originally formed the crystalized pockets exposed near the surface could be expected to continue from deeper levels. Current hand digging has only reached a depth of 14 ft (4 m) below the original surface grade. Further study is also needed to confirm details of how this pocket system formed.

The discovery of the Tribute Pocket has earlier been described by Carnein (2013) and Cowman & Persson (2015).

**References:**

Eckel, E.B. (1997) Minerals of Colorado, updated and revised. Golden, CO, Fulcrum Press, 487 p.

Montgomery, A. (1997) Reminiscences of a Mineralogist. Dillsburg, PA, Matrix Publishing Co., 43 p.

Carnein, Bob (2013) Rediscovery of a legendary topaz occurrence in El Paso County, Colorado. Lake George Gem and Mineral Club, Club News, September 2013, p. 7-13.

Cowman, J., and Persson, P. (2015) Great topaz find: Tribute Pocket, CO, USA. Minerals, The Collector's Newspaper, Issue #9, p. 1, 6-10.

A general model of pegmatite paragenesis is proposed that hypothesizes formation of miarolitic cavities as a consequence of pegmatite configuration and inclination, as well as early crystallization of massive quartz that confines the silicate melt and volatile phase, resulting in closed-system crystallization with a concomitant increase in pressure, consequent episodic cavity-rupture events, and corresponding changes in mica composition.Â  The optical data are correlated with composition, mode of occurrence, and relation to pegmatite paragenesis. Optical properties of the trioctahedral micas show a consistent trendâ€¦ CONTINUE READING. Save to Library.