Not everyone finds their passion in life at a young age. Andrew Taylor did. He remembers quite well the moment when it hit him. It was 1948 and his family was taking their first vacation after WW II.

"During the war, you couldn't go anywhere. You couldn't buy gas or tires. But by 1948, in the postwar years, things changed and my family was able to take a vacation. I was eight years old. We went into a curio shop in Taos, New Mexico—today we would call it a tourist trap—and there, on the counter was a bowl of staurolites for 35 cents each," Taylor said.

That bowl of staurolite crystals, a mineral that often occurs in a striking twinned cross-shape, made an impact that has lasted a lifetime. Taylor said, "I looked through all of them and bought the best mineral specimen. It blew me away. I touched and held that staurolite so often as a child that I polished it with my fingers. I've been crazy about minerals and gem stones ever since that day."

Growing up on the stark high plains of Western Texas was torture for someone interested in geology. Taylor fueled his passion through reading. He learned as much as he could about minerals and rocks. As a young teenager, he saw pictures of faceted gemstones in one of the rock and mineral books he read, and he knew then, that learning how to facet gemstones was something he would do in his life.

It took a few more years, as well as undergraduate and master's degrees in geology, before that dream was realized. Taylor said, "I was working on my Ph.D at Colorado School of Mines in 1967. I went into a lapidary shop in Denver and they had a Graves faceting machine for sale. Even though I was an impoverished graduate student, I bought that machine."

The faceting machine came with a 4-page instruction booklet. In other words, Taylor had to teach himself the mechanics of the craft. More than thirty years later, Taylor says he is still learning; although, the stones he carefully stores in small cushioned containers nestled in a black gem display case suggest otherwise.

When Taylor unclasps the case's magnetic tray lid and light sparkles off the stones, it becomes clear that the faceting machine is only part of the equation. A faceting machine is nothing more than a large table ornament without gem-quality stones. This is where Taylor's love of the outdoors and his geology background comes into play.

Finding Gemstones

Although a number of gem-quality stones can be found in Colorado—even an occasional diamond—the best known and most prolific are aquamarine, topaz, smoky quartz, citrine and amethyst. Of these, the aquamarine has earned status as the state's gemstone.

The processes that created aquamarine, and other gemstones, began five to ten miles beneath the earth's surface over 900 million years ago when large pools of molten rock began to cool. Over millions of years, as its temperature dropped, the magma cooled into a rock "stew" with larger crystals embedded in a matrix of smaller crystals and minerals. Granite, the building block of many of Colorado's mountain ranges, developed in this process.

Not all the magma turned into granite. Water-rich pockets containing the chemicals that combine only with great difficulty remained. Within these pockets, or pegmatites, large crystals began to slowly coalesce, and depending upon the mix of chemicals, various types of minerals and gemstones developed. Deposits rich in fluorine yielded topaz; those rich in berylite yielded aquamarine.

As gasses escaped from the cooling mass vugs, or voids, opened up. Into these open areas, the largest crystals grew. Locked deep within the earth's surface, it took many more millions of years of uplifting and mountain building for these crystal-laden deposits to reach the surface. Once near the earth's surface, erosion worked its magic.

Crystals are hard—harder than the rock that surrounds them. Rain, wind, freezing and thawing all caused the surrounding rock to crumble away. Exposed, pegmatites weather until they are gone. The gemstones they once contained become concentrated in placer deposits by the actions of rivers and other erosional forces. Today, high on mountain tops, rockhounds search for these deposits by looking at the soil for pieces of quartz, feldspar and other tell-tale minerals.

Taylor said, "Dig in these places, in the placer deposits, and with luck, you will find gemstone crystals." Taylor and his collecting partner use pry bars, hammers, chisels and most commonly, small shovels or three-prong garden scrapers, to patiently dig through the placer deposits.

Taylor first started looking for aquamarine on Mt. Antero 40 years ago. Twenty-three years ago, he expanded his search to include digging for topaz in the Tarryall Mountains. Finding stones gets harder ever year for two reasons. First, it's hard work.

Taylor's search for topaz in the Tarryall's has taken on somewhat of a routine. Every weekend, starting in Mid-May, he and his collecting partner head to the mountains. In June, at the end of the school year (Taylor teaches upper-level geology courses and hydrogeology at Metropolitan State College in Denver), the search for gemstones, topaz in particular, begins in earnest. By early July, it becomes too hot and the risk of lightning storms too great. The collecting season draws to a close.

During the five to six-week push, each week they spend one day packing for the trip to the mountains. They spend three days collecting. Those three days are grueling. Base camp is at 9,000 feet. Every day, Taylor and his collecting partner climb 1,000 vertical feet to prospective sites. The partners dig, hammer, scrape and otherwise sort through placer deposits all day. Then, they hike back down the mountain to base camp.

"Don't get me wrong. It's not exactly Spartan. We car camp so we bring lots of things to make us comfortable," Taylor said. "But I am 69 years old and it is hard work." On the other hand, Taylor believes that 40 seasons of mountain climbing have helped keep him healthy and fit.

The second reason it's harder to find stones has to do with geology. "People have been looking for these deposits and these stones for many years now. Many collecting sites are played out," he said.

Taylor believes there are more crystal-rich pegmatite formations. It's just that the weathering process needs to catch up to expose them. Until it does, they will remain hidden with the rocks.

Enough to Keep Busy

No matter. With 40 years of collecting under his belt along with gem and mineral show purchases to augment his stash, Taylor has plenty of faceting projects to occupy his time. Besides, the process of faceting a stone is a slow one. Taylor described his approach, "I'm not very fast; but I am very careful."

First, Taylor sizes up the mineral specimen. He studies the crystal from different angles. He holds it up to the light to check for flaws and to examine its color. He looks at the stone in oil and in water. Depending upon the stone and its value, this phase can take days, weeks and occasionally years.

"The type of cut you do is dictated by the flawless part of the stone. This is the creative part—looking at the stone and deciding how to cut it. The cut you do is dictated by the flawless part of the stone and you must figure out a way to maximize your use of this area," Taylor said. "The second part is tried and true methodology. It can get a little boring."

After Taylor decides how to cut the stone, he uses a diamond saw to cut away flawed portions. Then he "dops it up" or mounts the stone on a shaped metal stand called a dop using heated shellac crystals to create a stable bond. The dop is inserted into the quill of the faceting machine where it can be firmly held at precise angles. Lowering the quill onto a grinding plate, a mechanism that resembles a small turntable, he cuts and polishes each face of the stone. Accuracy counts. The tolerances are less than a fraction of a degree.

The cuts follow a pattern or recipe. The stone's cut faces, or facets, are aligned to capitalize on the way light reflects on the stone. Experienced and talented faceters design and sell these patterns. Taylor often invents his own recipes to capture the beauty of a particular stone.

Like many gem cutters, Taylor recommends cutting the stone's base or pavilion first. Then the stone is flipped over to cut the top. This requires a transfer jig that aligns the dead center of the stone and first dop with the center of a second dop. The second dop is attached to the pavilion and the first is removed. "If you've done it right, nothing is crooked and when you start cutting the top, everything lines up perfectly," Taylor said.

He continued, "I might spend 18 or more hours sitting in front of the faceting machine cutting and polishing a stone. When I'm done, I remove the stone from the dop and clean off all the shellac. This is the first time I actually see results of my work. I realize that I am the first person to see the beauty that grew from that molten rock hundreds of millions of years ago. It's an amazing thrill. I will facet stones until the day I die."

Taylor can't really explain his passion for geology; although, he is thankful he does have a passion in life. Taylor said, "It puzzles me when I meet people who have no burning ambitions in their life. Everyone needs a passion."

Why geology for Andrew Taylor? He explains it this way, "I was born to be a geologist. I had no choice in the matter. I just didn't know it until I was eight and I held that staurolite for the first time."