

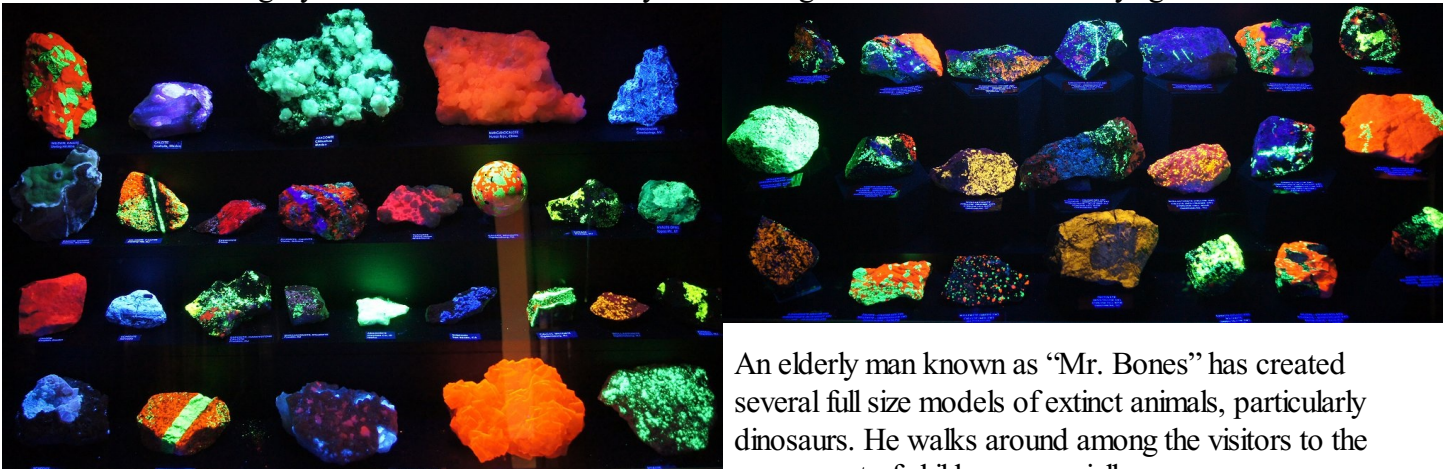
## Rocks

This past weekend was mostly devoted to rocks. For much of Friday, Saturday, and Sunday I was a volunteer at the Denver Gem and Mineral Show, where I have served for several previous years. On Saturday morning I attended the 150 year celebration of the operation of the Edgar Mine in Idaho Springs, now operated as a teaching mine for Colorado School of Mines. These photos are from both events.

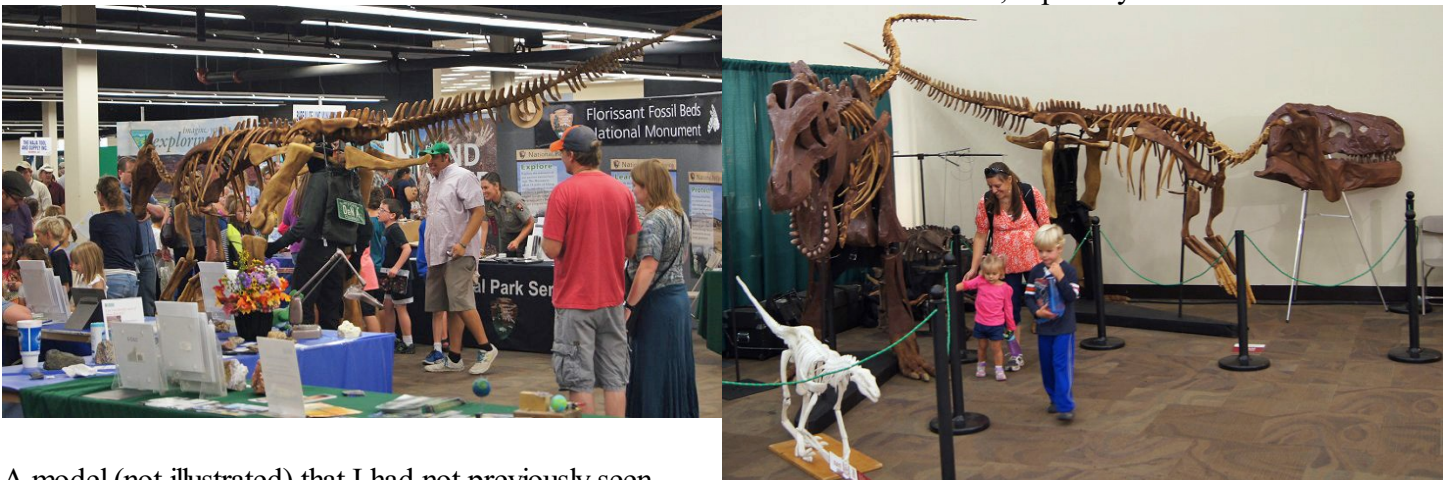
At the mineral show there is an area of about ten educational booths (where I served), whereas there seemed to be more than a hundred booths of people selling pretty minerals and jewelry made from them, plus a few dozen displays of exquisite examples of various minerals. This year's theme was Minerals of the Southwest (of the USA). Here are two of the major displays which I recorded for their colors.



In a darkened room were displays of fluorescent minerals that were brightly colored when illuminated by ultraviolet light. Their colors in ordinary light are dull.



An elderly man known as "Mr. Bones" has created several full size models of extinct animals, particularly dinosaurs. He walks around among the visitors to the amazement of children, especially.



A model (not illustrated) that I had not previously seen was of a saber-toothed tiger. Mr. Bones walks inside the large models and beside the smaller models, operating them like puppets.

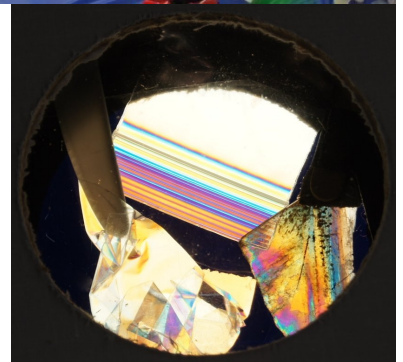




Dr. Andrew Sicree (from State College, Pennsylvania) operates a booth “Minerals that Do Things”. In the left photo he is demonstrating rocks that bend. In the right photo the children are seeing rocks that conduct electricity, are magnetic, are ground into baby powder (from the rock talc), smell bad from hydrogen sulfide, and taste like salt because that is what the rock halite is made of.



In the left photo the helper guides children who are breaking calcite crystals to show standard cleavage planes. In the middle of the table we heat a variety of mica, called vermiculite, that has water within the crystals. They expand like popcorn, with some achieving worm-like shapes. Of the two boulders at the left, the smaller is made of light weight plastic. The larger is the volcanic rock “pumice”. It is filled with so much air that it will float on water. Everyone, including small children, who lifts it is amazed that it is so light weight. In the right photo the children are inserting samples of mica, clear plastics, and tape between two crossed polaroid sheets (in the white box and the black pipe). The substances rotate the polarization angles enough so that colored light passes through the otherwise black view. The colors depend on the amount of rotation which likewise depends on the thickness of the substance. This is a sample view inside the black pipe, showing a clear plastic bag at the top, clear tape at the lower left, and a thin sheet of mica rock at the lower right.



<http://www.mineralseducationcoalition.org/demonstrations> is Dr. Sicree’s website. Beyond our booth was a large area where visitors could practice panning for gold. They use water in a pan to try to separate small gold fragments from sand and gravel. On Friday there were large groups of school classes.







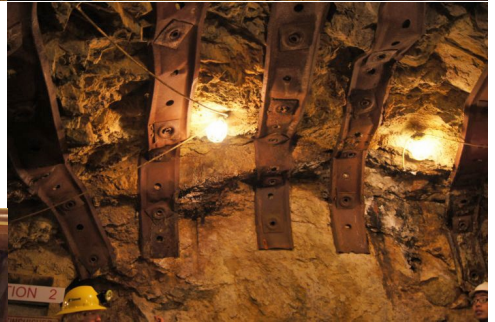
It was a beautiful day for the 150 year celebration of the Edgar Mine as the crowd of visitors began to arrive. Both mining procedures and mine safety are taught in this mine. At the end of the opening ceremonies one of the organizers pretended to fall from an injury. A team of students quickly demonstrated their mine rescue work. Then the visitors lined up to enter the mine for a self-guided tour. Students in yellow shirts were at significant locations to explain features of mining in hard rocks. I brought with me Ye Tian and Sally, from Sichuan, China as additional guests. Ye Tian is a student in petroleum engineering. They were newly-arrived in Colorado and had not yet been in the mountains. They appear in some of the photos. The map shows the tunnels on this level.



We entered through the long straight part in the lower right corner of the map and explored the middle area



(but not other long tunnels.) A student explained how expandable rods are placed in drilled holes to anchor steel plates to keep rocks from falling. The steel technology replaces the old practice of wooden beams that eventually rot or are crushed.



We saw displays of historic mining equipment. There is a large room inside that is used for classes. It also has historic equipment. A diesel powered tractor could be used for

hauling ore carts on very narrow gauge steel tracks. We saw an example of drill holes wired for explosions.







Back outside we met a burro, similar to what prospector miners of previous centuries used to carry supplies. There were several basins set up for practicing panning for gold. Cake refreshments were served. We left before the lunch was made available. There were some fund-raising activities, including a “silent auction” where people could write a bid in an attempt to buy some historic items. The Colorado School of Mines was also looking for major donations to help create a new building outside the mine for additional training activities.

The Edgar Mine in the past produced high-grade silver, gold, lead and copper. Metal production is no longer done here. Instead the teaching/training activities include having the students drill holes in the rock (there are thousands of such holes in this mine), surveying, geologic mapping, rock fragmentation, blasting practice, mine ventilation, rock mechanics, mine operations, rescue training and mine safety. This mine seeks to provide the best such training for hard rock mining in the country, possibly in the world. Many international students are among those being trained here.

Dr. Ed Holroyd  
20 September 2015