

Rambling Through Colorado — 1 The Madonna Mine

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In the summer of 1987, my wife and I spent two weeks roaming around Colorado. We collected at many mine dumps and exposures throughout the state. This series of articles will recall some of the interesting mineral collecting areas we encountered. Note: With a few exceptions, we did not know the property owners. As we did, you will have to explore at your own risk or try to locate the current landowners/leasers.

Near Monarch Pass and the Continental Divide in Chaffee County, lies a large complex called the Madonna Mine. It is on the northwest slope of Monarch Ridge. This ridge (I call it a mountain) has been heavily mined and is riddled with adits, roads, and dumps from the base to the top.

The dumps Debbie and I investigated were located at the base of the ridge next to a dilapidated tower where ore was hauled from the mountain (probably the No. 6 level) to the loading area where it was hauled off to be milled. In 1987, this tower was conspicuously marked "Ski Tours." In fact, that is what we saw from U.S. Highway 50, where we first saw this mine.

The mine has a long history. It first opened in 1878 after mineralized surface exposures were found high on Monarch Ridge. The history is described in detail in Crawford (1913) and Dings and Robinson (1957) and will not be further elaborated on here. Dings and Robinson describe 12,685 feet of drifts and cross cuts and 1,741 feet of vertical development by 1953. This writer has not located any more up-to-date information or references as to any activity more recent than 1953.

Mine workings occur in the Manitou and Fremont formations, both dolomitic limestones, and the Harding quartzite. The Manitou lies unconformably on the undulating surface of a Precambrian granite (Dings and Robinson).

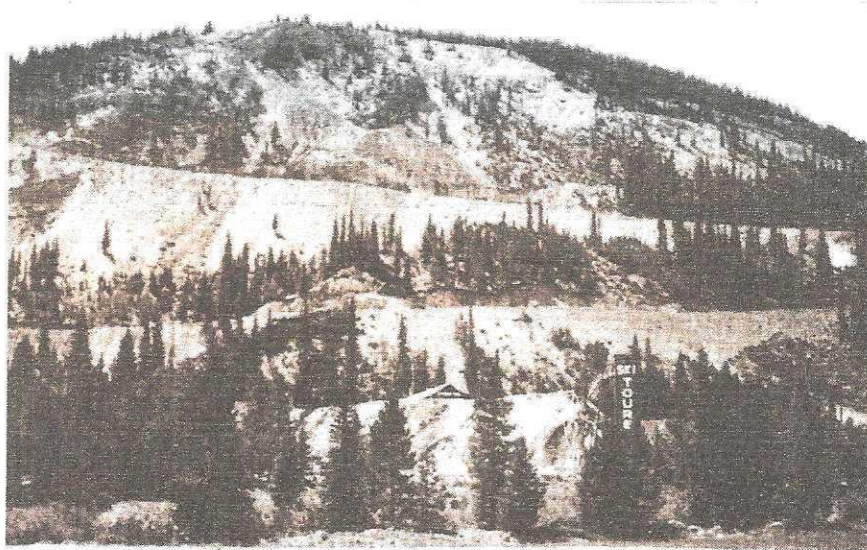


Fig. 1 Madonna Mine, Monarch Ridge near Monarch Pass,
photo by Alan Goldstein.

The most significant structural features include the Madonna fault, and the Hawkeye and Mayflower faults to a lesser extent.

Most of the ore occurs as oxidized deposits. The primary ore-bearing gangue is "limonite." Writers described primary minerals including argentite, cerargyrite, chalcopryrite, galena, native gold, pyrite, and sphalerite. Secondary minerals noted include cerussite, hemimorphite, malachite, and smithsonite. Gangue material, in addition to limonite include limestone, dolomite, and quartz.

In the two hours we spent examining the dumps, we found large amounts of ferroan dolomite, goethite (limonite), and pyrite. In smaller amounts we collected calcite, galena, hemimorphite, and malachite.



Fig. 2 Hemimorphite, yellow color, x12, Madonna Mine, Monarch Pass, Colorado, photo by Chris Anderson and Alan Goldstein.

Minerals collected on the dump

Calcite: Crystals forming first-order prisms with corroded caps were collected in a single specimen. The largest crystal found was 2 mm in length. The crystalline matrix fluoresces brilliant red in short wave ultraviolet light. The crystals do not fluoresce, and dendritic inclusions, which were not analyzed by the writer, were noted about 0.25–0.5 mm below the surface of the crystals.

Dolomite: Massive chocolate-colored ferroan dolomite is common, but free crystals are rare. It is often peppered with cubic pyrite crystals up to 0.5 mm.

Galena: Very sparse on the dump and no free crystals. We only found one specimen by randomly breaking a chunk of goethite; it may be argentiferous.

Goethite: "Limonite" in earlier works; occurs as yellow to deep brown masses of various textures and lusters. Occasionally found as iridescent botryoidal masses, associated with most minerals observed on the dump.

Hemimorphite: Observed on one particular dump; we collected about one flat of material. Colorless unless coated with goethite powder, and often in drusy vugs with intergrown crystals. It always has a goethite matrix. Some spectacular micro-mount specimens, with single crystals and sprays or water-clear crystals perched on iridescent goethite were found, with crystals from less than 1 mm to about 3 mm long.

Malachite: Occurs as crusts and stains, widely scattered on the dump; some large specimens were found.

Pyrite: The most common sulfide on the dump; occurs as cubes from 0.5 mm to about 5 mm across. Some massive chunks were found, but they appear to contain unstable frimoidal pyrite that decomposes. Some of the most spectacular specimens occur frozen in ferroan dolomite. Pyrite was made abundant on the dump because it was mined from the most recent workings, the lowest levels in the mine. The pyrite in most of the upper levels had altered to goethite.

What we did not find (but you might if you spend some time there), from Crawford, 1913:

Argentite: Reported in microscopic grains with pyrite in limonite.

Cerargyrite: Mixed with "earthy or sooty limonite". Determined by chemical testing only.

Cerrusite: This mineral was a major ore. It is usually massive, but some crystals were reported from the lower levels. Typically has a yellowish color, often argentiferous.

Chalcopyrite: Massive golden chunks only.

Native Gold: Small flakes reported; some silverish flakes were thought to be a tellurium mineral.

Smithsonite: Typically massive, dark gray color or as a soft yellowish to brownish mineral. Small crystals in vugs reported.

Sphalerite: No description given for its occurrence at this mine.

The entire mountain is covered with dumps. As the ore shoot elevation increased, some changes in mineralogy were noted. Smithsonite and hemimorphite should be more abundant higher on the ridge according to Dings and Robinson. The oldest mine operations were highest on the mountain when zinc was not mined. Consequently, at these elevations, quantities of zinc ore may be common on the dumps and in the mine.

We hope to return to the Madonna Mine in the near future. If you have been there and found a hammer with a rubber cover on the handle, it is mine; the only rock hammer I have misplaced in almost 25 years of collecting!

References

- Crawford, R.D., 1913, *Geology and ore deposits of the Monarch and Tomichi districts, Colorado*: Colorado Geol. Surv., *Bull* 4, 317 p.
Dings, M.G., and Robinson, R.D., 1957, *Geology and ore deposits of the Garfield quadrangle, Colorado*: U.S. Geol. Surv., *Prof. Paper* 289, 110p.

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