Chalcopyrite and galena are rare and occur only in fault zone breccias. Several mineralized zones are moderately radioactive, especially veins in the Rancheria and Fusseman formations. The radioactive minerals were not identified.

The order of mineral deposition is well illustrated in several zoned veins. Studies of veins and thin sections of vein material indicate the paragenesis shown in fig. 4.

<table>
<thead>
<tr>
<th>Early</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td></td>
</tr>
<tr>
<td>Fluorite</td>
<td></td>
</tr>
<tr>
<td>Barite</td>
<td></td>
</tr>
<tr>
<td>Calcite</td>
<td></td>
</tr>
<tr>
<td>Pyrite</td>
<td></td>
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</tbody>
</table>

Figure 4 Paragenesis of minerals in the Bishop Cap hills.

Grant’s Prospect

Grant’s prospect is located in the NW ¼ section 25, T. 24 S., R. 3 E. (fig. 2). Barite-fluorite-quartz mineralization has been explored by several tunnels, shallow pits and numerous pits within fault zones. The prospect includes several separated deposits located within a fault block bounded on the east and west by north-northwest-trending faults and on the north by the Blue Star fault. Mineralization occurs along all three faults and in several lesser fractures within the Fusseman Dolomite in the center of the block. At the north end of the block fluorite occurs in the La Tuna Formation where the Blue Star fault brings the La Tuna against the Percha Shale. Intense fracturing, silicification, and relatively large amounts of fluorite in this area apparently result from the convergence of the three major faults, and the presence of favorable host rocks. The fault which bounds this block on the west is the longest continuously mineralized vein in the Bishop Cap hills. Rothrock (1946) reported that fluorite occurs in this fault for more than 1,200 feet, with an average vein thickness of three to four feet. Fluorite and quartz occur along the footwall in the Fusseman; ferruginous and manganiferous calcite occur near the center of the vein; and quartz, barite and fluorite occur in the Canutillo Formation comprising the hanging wall. The vein pinches and swells along strike and downdip. Open-space filling was the predominant type of deposition.

Most of the fluorite produced in the Bishop Cap hills has come from this prospect. A study by the United States Bureau of Mines (Sur, 1946) concluded that the fluorite deposits on Grant’s prospect were too low in grade and too small in size to be economic. However, these veins have not been cored. Possibly economic deposits of fluorite are present, especially within the extensively faulted zones of the prospect. The claims are owned by J. F. Grant of Las Cruces (1969).

Blue Star Prospect

The Blue Star prospect (NW ¼, NE ¼, sec. 24, T. 24 S., R. 3 E; fig. 2) has been partially explored by two short tunnels and several shallow pits. About 12 tons of fluorite have been mined from this prospect (Williams, 1966). Core drilling was done by the Rangaire Corporation during the winter of 1969-70.

The prospect is on the Blue Star fault. Most of the mineral deposition is open-space filling in the fault zone, but wallrock replacement is common. Large pods of fluorite and barite-fluorite crop out in the largest vein but the mineralization probably is shallow as suggested by core data. Core recovered from one vein shows barite, fluorite, calcite, some pyrite and a few tiny cubes of galena at about 45 feet from the surface; at 50 feet, calcite predominates. The drill cores show that the vein is 15 feet thick near the surface but thin to less than four feet at a depth of 45 feet. The vein is less than 100 feet in length and dips about 55° N. The purple fluorite here is moderately radioactive.

Numerous mineralized minor faults branch about 30° southwest from the Blue Star fault. A second zone of mineralized minor faults, about 400 feet south of the prospect, generally parallels the Blue Star fault. Almost all the mineralized minor fault zones crop out on the dip slope of the Fusseman Dolomite (fig. 2). None appear to constitute a workable deposit.

In summary, apparently small amounts of fluorite and barite mineralization are widespread in fault zones within the Fusseman, and beneath shale units in the Bishop Cap hills. Silicification is the most important alteration that accompanied mineralization. About 120 tons of fluorite have been shipped from the area, mostly in 1944. Limited testing along some of the most favorable areas has failed to locate economic deposits, but commercial deposits of fluorite and barite may be present in the Bishop Cap hills.
REFERENCES


