

There are two drifts on the vein: one at an altitude 9,090 feet and one at an altitude 9,264 feet (see fig. 10). The lower level comprises about 1,000 feet of drifting and some stoping, both from the level and a sub-level room. The upper level consists of about 1,000 feet of drifting and stoping. The lower level is connected to the upper by a raise, which was inaccessible at the time of this work.

The Dunmore vein or lode is the most varied and complex of any in the entire area. It extends from pre-Cambrian quartzite into breccias of the San Juan tuff. The fault fissure along which the Dunmore lode has been formed offset the beds of the Uncompahgre formation by at least 2,800 feet in pre-San Juan time (see page 305), and subsequent displacement has offset the beds of the San Juan 80 feet vertically. In the quartzites of the Uncompahgre formation the lode is 100 feet wide throughout the 800 feet of its exposed length. In the overlying breccias of the San Juan the lode is narrowed on the average to only a few feet. The north half of the lode in the pre-Cambrian rocks consists of upturned mineralized slates that had been sharply dragged past the truncated quartzites of the north wall in pre-San Juan time (see fig. 11). Between these slates and the north wall is a quartz fissure vein about one to three feet wide. A narrow sheared and altered basic dike which is scarcely distinguishable from the slate occurs locally along this vein. Both the lower and upper tunnels follow this vein near their entrances, but both cross to the south wall where most of the development and mining have been done. The south half of the lode consists generally of siliceous vein matter that is largely barren. The south wall lies along the principal fissure of the fault zone; most of the displacements have occurred on it, including considerable post-mineral slipping which has resulted in mashing and brecciation of much mineral matter. In addition to these features of the lode there are two chimneys of breccia within which ore bodies are located. Between the lower and upper portals is a breccia chimney and a tungsten ore shoot which is 8 to 20 feet

wide and 40 to 50 feet long. It is principally in the silicified area immediately to the north of the south wall. This chimney consists of a breccia of fine-grained quartz, sericite, and kaolin which is partly filled and cemented with huebnerite, coarse-grained quartz, and lesser quantities of sphalerite galena, hematite, and barite.

The other chimney or pipe in the lode lies west of the upper portal and shows more features of a breccia pipe in some places than in others. In it the same fine-grained siliceous material that occurs in the tungsten chimney and in the generally silicified areas of the lode is widely replaced by specular hematite. All stages of this replacement are revealed, but the replacement is generally complete enough to constitute a potential source of iron ore. Within the hematite chimney and near its western margin is a copper-ore chimney in which chalcopyrite and aikinite (Cu_2S , 2PbS , Bi_2S_3) are the principal ore minerals superimposed upon the siliceous and hematitic material. Contained also in the gangue are rhodochrosite, chlorite, and barite. As is shown in figure 11, pebble and breccia dikes of quartzite and slate are injected into the walls; these contain pyrite, quartz, and kaolin, but no ore minerals.

The tungsten (huebnerite) deposits, which appear to be products of the latest mineralization, are also sparingly present in the part of the vein above the base of the San Juan tuff. The prominent yellow knob that stands above the chalcopyrite chimney is largely barren mineral matter and intensely altered rock, and the widening of the lode here in the base of the San Juan appears to be connected with the numerous smaller veins formed in the prominent N. 10° W. fissures in the San Juan tuff.

Although the bulk of the Dunmore lode appears to be of late Tertiary age there is no direct evidence that some of the mineralization did not take place during the early Tertiary period so prominently represented at Ouray; in fact, the greater size of the lode in the pre-Cambrian rocks is suggestive of this earlier period. The fissure is pre-Tertiary

in age in part, and it appears that it was one if not the most important feeder channel for many veins in the volcanic rocks of the Upper Uncompahgre district. It is deserving of greater exploration for this reason alone. Its size, if not its generally low tenor, should favor a large operation. Its relative accessibility favors it over many other deposits. The aikinite content of the chalcopyrite chimney makes the deposit worth investigating as a possible source of bismuth.

In 1917, eight tons of ore shipped to the smelter contained 0.50 ounce of gold, 194 ounces of silver, and 509 pounds of copper.⁵³ Considerable development of base-metal and tungsten ores was done under lease during 1937 by Bud Franz of Ouray. To the south of the Dunmore mine is the patented Grass Roots Pay claim on and near which there has been considerable prospecting and some development. Although the veins of this claim are mapped the workings are inaccessible. The ore from it is reported to have contained some bismuth, but the most valuable metals in it seem to have been silver and gold.

West of the Dunmore mine at an altitude of 10,250 feet on Silver Creek is the MacGregor prospect tunnel, in a strong northerly branch from the Dunmore lode. The branch vein is about five feet wide near the prospect portal. Ore containing two ounces in gold to the ton is reported to have been shipped from this prospect.

Chrysolite Mine

The Chrysolite mine is located on the east side of Red Mountain Creek on the same lode as the Dunmore claim which it joins on the east. As the Chrysolite portal has long been caved and no maps of the workings have been found, little positive geologic information on the mine can be offered. It is also in the pre-Cambrian rocks along the Dunmore lode. Quartzite forms the north wall, and a basic dike which is well exposed above the portal probably forms the south wall. The topographic expression suggests that there

⁵³Henderson, C. W., U. S. Bur. of Mines, Records of the Mineral Production and Economics Division, Denver, Colo.

may be another vein south of this dike at its contact with quartzite, but the contact is unexposed and not explored unless through a crosscut from the Chrysolite tunnel. The ore and gangue are similar to those of the North Star to which it occupies the position of a lower level. The dump material contains much decomposed pyrite and quartz with small quantities of lead and zinc sulfides, rhodonite, and rhodochrosite. Located as it is across U. S. highway 550 the Chrysolite claim is perhaps the most accessible position from which to explore this lode in the pre-Cambrian rocks.

North Star Mine

The North Star mine is located above and east of the Chrysolite on the same deposit. The workings consist of several short drifts, winzes, and pits. The vein is along the north wall of the fissure zone and is considerably sheared and altered. The dike rock along the south wall is also much altered, sheared, and replaced by vein matter. Siliceous and pyritic vein matter with considerable rhodochrosite, rhodonite, and some base-metal sulfides make up the deposit. The deposit would be most economically worked from the Chrysolite property.

Mother Cline Mine

The Mother Cline mine is located 300 feet southeast of the North Star. A large red sheet-metal boarding house stands at the portal of the lower workings. The deposit is in white quartzite and unrelated to a distinct fissure or vein. The lower workings consist largely of exploratory tunnels in which no ore has been found or mined. At the branch in the tunnels, however, a vertical raise leads to a room-like level 75 feet above. This room is entered through a short tunnel higher up the hill from the main adit. Between these two levels are four small sublevels (see fig. 12). Nothing can be seen of the deposit in the lower adit tunnel. In the upper workings irregular and rough corrosion cavities in the walls are lined with quartz crystals. Early corrosive solutions appear to have leached large caves, pores, and

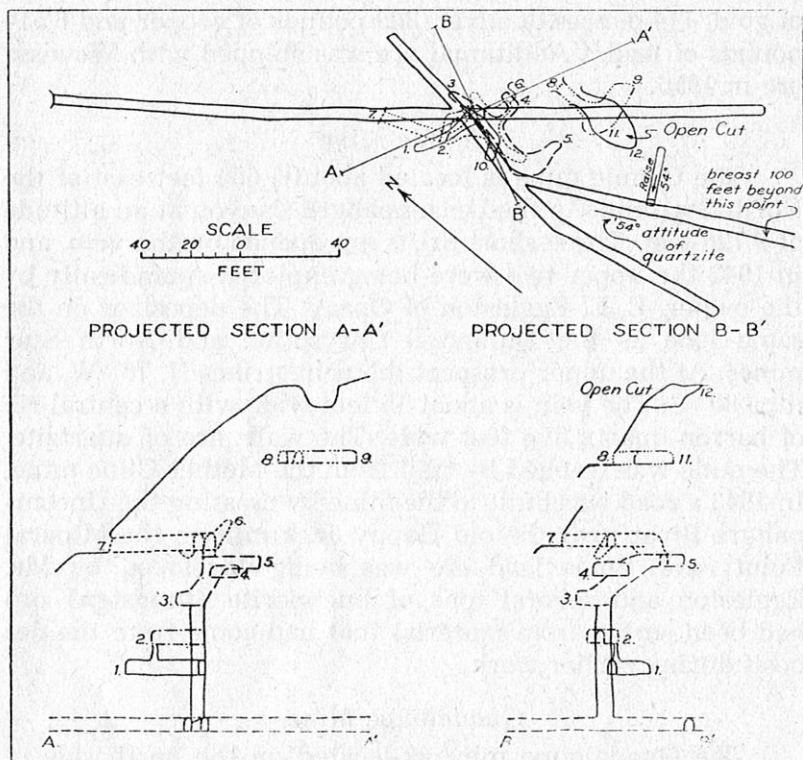


Figure 12. Plan and sections of the Mother Cline mine.
(Adapted from a survey by J. C. Ingersoll.)

irregular channels in which the gangue and ore were subsequently deposited. Green copper staining can be found in gossany masses of iron and manganese oxides in places. On the lower dumps coarse barite gangue intergrown with coarse-grained sphalerite, pyrite, and minor quantities of galena can be found. There is little or no evidence of continuity in depth for the deposit and it appears to have been highly localized.

In 1906, 34 tons of ore were shipped to the smelter, containing 8.37 ounces of gold, 4,858 ounces of silver, 3,347 pounds of copper, 22,105 pounds of lead, and 10,880 pounds of zinc. In 1911 a shipment of 10 tons contained 0.39 ounces

of gold, 114 ounces of silver, 300 pounds of copper and 6,514 pounds of lead.⁵⁴ Additional ore was shipped with Wewissa ore in 1916.

Connie Mine

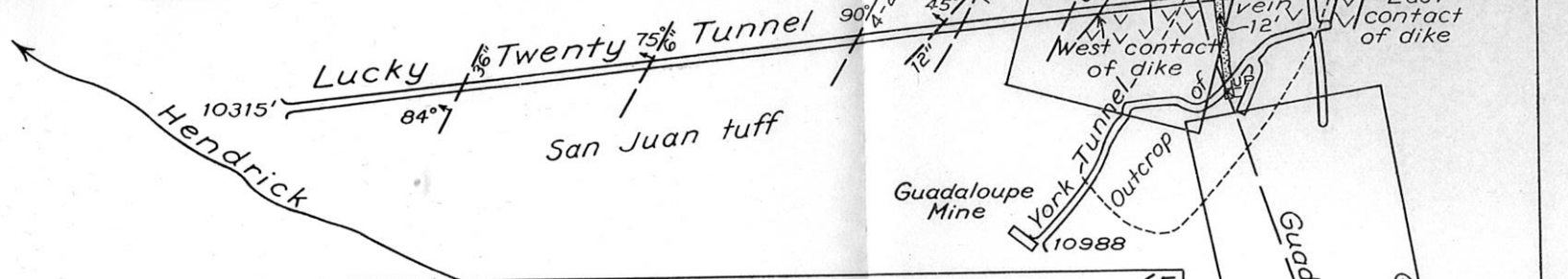
The Connie mine is located about 1,600 feet east of the North Star mine in the Uncompahgre Canyon at an altitude of 9,726 feet. Three short drifts are opened on the vein, and in 1942 the upper two were being explored sporadically by the owner, E. E. Eggleston of Ouray. The deposit is on the same lode as the Dunmore, Chrysolite, and North Star mines. At the upper prospect the vein strikes N. 78° W. and dips 80° S. The vein is about 15 feet wide with a central rib of barren quartz five feet wide. The walls are of quartzite. The mine was reached by trail from the Mother Cline mine. In 1943 a road was built to the mine by crossing the Uncompahgre River near the old Happy Jack mill on the Mineral Point road. Some lead ore was being developed by Mr. Eggleston and several tons of huebnerite (tungsten) ore had been sorted from material that had come from the deposit during earlier work.

Guadaloupe Mine

The Guadaloupe mine is located on the north side of Hendrick Gulch at an altitude of 10,983 feet. At the mine portal is a boarding house, shop, and partly collapsed snow shed. The crosscut to the workings, known as the York tunnel, was open, but bad air not far from the entrance prevented examination and mapping of the deposit. The strike of the vein is N. 5°-10° W. and the dip 65°-80° E. The vein is poorly exposed at the surface because of talus and mud-flow material; however, its course is fairly well determined by the Guadaloupe drift and drifts in the short crosscut tunnels in the gulch to the south (see fig. 13). The York tunnel is in highly altered rock through most of its length. Although the tunnel was started in andesite it soon crossed

⁵⁴Henderson, C. W., U. S. Bur. of Mines, Records of the Mineral Production and Economics Division, Denver, Colo.

MAP OF THE GUADALOUPE MINE AND LUCKY TWENTY TUNNEL



CROSS SECTION ALONG THE LUCKY TWENTY TUNNEL

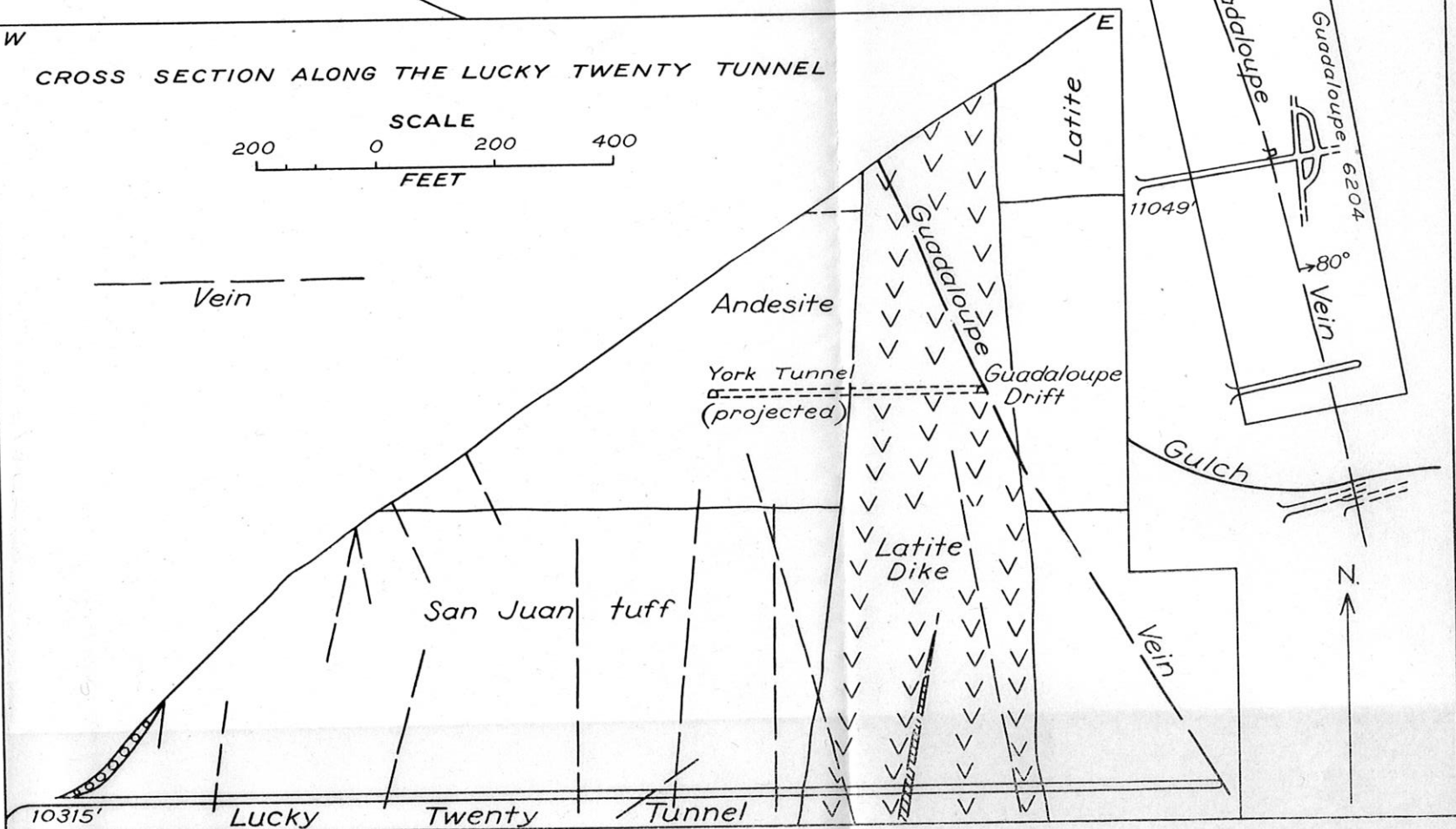


Figure 13. Plan and section of the Guadalupe mine and Lucky Twenty tunnel.

into a steeply dipping latite dike which forms the walls of the vein along the part that was mined.

Judging from the Guadalupe dump, the fissure vein must have consisted of siliceous and kaolinitic material much brecciated, sheared, and altered. A small quantity of sulfide ore was left in the shop; it consisted of chalcopyrite, tetrahedrite, galena, and pyrite. The principal metal in the ore mined was copper; 260 tons shipped during 1919-1920 averaged 21 percent copper with no lead or zinc; 56 tons shipped in 1921 contained 28 percent copper with no lead or zinc.

The Lucky-Twenty tunnel is a crosscut located at an altitude of 10,315 feet down Hendrick Gulch from the Guadalupe mine (see fig. 13). Its objective was the Guadalupe vein. Although most of the tunnel was driven in 1923, during 1926-1927 the tunnel was extended for the last 200 feet to intersect what is considered to be the Guadalupe vein 1,960 feet from the portal. The breast is reported to have barely broken into the Guadalupe vein, and no sampling or exploration of the vein was accomplished before work was abandoned. The last work in 1927 was done by W. R. Ritchie and William McCullough.⁵⁵ What was thought to be the Guadalupe vein was cut showing a width of about four feet. The operation was discontinued because the vein contained only lead and zinc, whereas silver and copper had been expected. The lead and zinc were contained in a 30-inch vein at the footwall; the hanging wall part of the vein was largely soft gouge. Most of the other veins cut by the tunnel dip steeply to the west and strike about N. 30° E. Their widths range from six inches to twelve feet. At 1,430 feet from the portal a wide vein was followed for 140 feet to the south and near the end a 140-foot raise was driven. A small quantity of sphalerite was found in many of the veins. With the cost of the Lucky Twenty tunnel written off, the property should invite additional exploration and

⁵⁵Oral communication.

development, especially beneath the highly mineralized Guadalupe ground.

The Guadalupe mine was located and worked mostly prior to 1900. The mine was located on the map of the Silverton Folio, but no description of the mine was made by Ransome. The record of small output since 1900 is as follows:⁵⁶

| Year | Tons | Gold (ounces) | | Silver (ounces) | | Copper | |
|------|------|---------------|---------|-----------------|---------|---------|---------|
| | | Total | Per Ton | Total | Per Ton | Pounds | Percent |
| 1906 | 40 | 7.98 | 0.20 | 1,200 | 30.0 | 8,000 | 10.0 |
| 1917 | 29 | 0.76 | .03 | 497 | 17.1 | 6,189 | 10.7 |
| 1919 | 167 | 0.80 | .01 | 7,809 | 46.8 | 70,875 | 21.2 |
| 1920 | 93 | ----- | ----- | 4,672 | 50.2 | 39,361 | 21.2 |
| 1921 | 56 | ----- | ----- | 3,227 | 57.7 | 31,677 | 28.2 |
| 1930 | 21 | ----- | ----- | 356 | 16.9 | 2,426 | 5.8 |
| | 406 | 9.54 | | 17,761 | | 158,528 | |

Silver Link Mine

The Silver Link mine is located above the bold quartzite cliffs that rise above the Mineral Point road about 2,100 feet east-southeast of the State bridge on U. S. highway 550. The mine is generally reached by a rather poor trail from the top of the steep stretch of the Mineral Point road. The portal of the mine is located at an altitude of 10,500 feet in the quartzites of the Uncompahgre formation and a few feet below the base of the San Juan tuff. The principal adit is a crosscut 1,500 feet long. The crosscut has a dog-leg turn 440 feet from the portal, the bearing west of it being more directly to the vein. The upper or early workings on the vein, known as the Seaburg drift, are over 800 feet long. The strike of the vein is N. 5°-10° W.; the dip is steep-to-vertical eastward. These workings were not seen, but they lie above the high cliffs that rise abruptly over the lower

⁵⁶Henderson, C. W., U. S. Bureau of Mines, Records of the Mineral Production and Economics Division, Denver, Colorado.

tunnel. The San Juan tuff lies on a very irregular pre-Cambrian erosion surface which at the mine slopes eastward so that the tunnel soon passes into the San Juan tuff. Although the crosscut is passable the drift cannot at present be examined because of the terraces of limonite ooze that clog the entrance where a great volume of water issues from the vein back. Ransome⁵⁷ describes the deposit as follows:

"The lode is a sheeted zone 20 feet or more in width. The ore is chiefly bornite and tetrahedrite, carrying silver and chalcopyrite, and occurs in bunches along some one of the fissures. It is found in quartz, which is largely silicified San Juan breccia. It contains from 20 to 30 percent copper and sometimes as much as 300 ounces of silver per ton. The best ore is said to occur in solid quartz. There has been considerable post-mineral movement along the lode, resulting in soft gouge, and where the disturbance is pronounced it is regarded as unfavorable for ore. The ore usually occurs near the west (called the foot) wall, but it is far from continuous. The country rock on both sides of the lode is traversed by numerous parallel fissures, along which there has frequently been some late movement, as attested by the presence of wet clay gouge."

Over 2,200 feet of drifting has been done along the vein. Ransome⁵⁸ mentioned a 60-foot winze which was being reopened in 1900 to explore the lode in depth and especially to determine whether it would continue down into the quartzites. This winze was deepened to 400 feet according to the patented claim survey, and this depth probably should reach the base of the San Juan tuff at this point. Most of the veins, however, bottom at the pre-Cambrian surface and even if the Silver Link does not there is no evidence that the ore should be better at such a position; furthermore, there would still seem to be ample backs above the tunnel level.

The Silver Link mine is one of the oldest in the district, the tunnel work and much of the drifting having been done in the early eighties. In 1882 Burchard⁵⁹ reported, "The Silver Link, Climax and Epoch, and Silver Star are on a vein which varies from 18 to 20 feet in width and shows ore croppings from 5 to 6 feet wide, which will mill 160 ounces of silver and 20 percent of copper to the ton, while specimens from some of these claims run up to 8,000 ounces of silver per ton. The first three named belong to the Silver Link group. The owners intend to tap the Silver Link with

⁵⁷Op. cit., p. 198.

⁵⁸Op. cit.

⁵⁹Burchard, H. C., Report of the Director of the Mint upon the production of precious metals during the calendar year 1882, p. 509, 1883.

a crosscut tunnel of about 1,100 feet in length, which has been run about 700 feet; this tunnel will tap the vein about 2,000 feet below the croppings."

According to the Mint reports, ore worth about \$50,000 was shipped from the Silver Link mine from 1888 to 1891. The mine then remained idle from 1893 to 1899 when it was reopened and operated for several years. In 1902 shipments of 70 tons of ore grossed 12.0 ounces of gold, 1,685 ounces of silver, and about 44,084 pounds of copper.

Michael Breen Mine

The Michael Breen, or the Mickey Breen mine, as it is familiarly known, is located on the Mineral Point road about one and one half miles from U. S. highway 550. The altitude at the main or lower level is 9,728 feet. The Mickey Breen group, including the Mountain Monarch, consists of 16 claims, eight of which are patented and eight unpatented. An old mill built prior to 1900 still stands between the road and the Uncompahgre River. In 1942 the buildings consisted of a large boarding house, a shed, and a work shop located near the Mountain Monarch portal.⁶⁰

The Mickey Breen vein has been worked at six levels and several additional sublevels. Most of the stoping has been between the No. 3 and No. 4 levels. During 1943 work was in progress from the main or No. 9 level. Entry to the upper levels was originally gained by drifting from portals along the steep east side of Albert Creek. The crosscut tunnel is about 1,425 feet long, cutting the Mickey Breen vein 750 feet, the Royal Consort vein 1,250 feet, and the Helen vein 1,300 feet from the portal. The Mickey Breen vein has been worked for a horizontal distance of about 1,350 feet, and it is estimated that drifts and raises aggregate 6,000 feet.

The Mickey Breen vein is six inches to several feet wide, although it averages about two feet. The strike is rather uniformly about N. 86° W.; the dip, however, is more vari-

⁶⁰Labeled Monarch on pl. 1.

able. On the main level the vein dips 85° - 90° S. along the drift east of the adit and 85° - 90° N. west of the adit. Between the No. 4 and No. 5 levels the dip is generally to the south, whereas between the No. 5 and No. 9 levels the dip is generally to the north. Where the adit crosses the vein it is very narrow but it widens both east and west. The principal past work on the No. 9 level was done in the west drift where an upward tapering ore body was stoped for about 260 feet or up to the No. 5 level. About 60 feet east of the adit an inclined raise leads to sublevels 8 and 7.

The vein matter is commonly banded and has resulted from the filling of simple open spaces or of closely-spaced sheeting. It typically consists of quartz, galena, sphalerite, chalcopyrite, pyrite, rhodochrosite, and tetrahedrite. The country rock adjacent to the vein is locally impregnated with pyrite, and more rarely chalcopyrite. An old report mentions 16 samples taken from the Mickey Breen mine that averaged .09 ounce of gold and 18 ounces of silver to the ton, 2.17 percent copper, 10.5 percent lead, and 18.5 percent zinc, but no record was given of the position or width of vein matter sampled. There are reports of small shipments in the nineties in which the gold content was as high as 15 ounces to the ton. Probably much more ore has been opened up or broken than has been mined, although much of it probably is only of mill grade.

Near the end of the Mickey Breen crosscut tunnel, two veins, the Royal Consort and the Helen, were found and drifted upon for short distances. The Royal Consort vein strikes N. 45° E. and dips 50° - 70° NW.; it intersects the Helen vein a short distance east of the tunnel. The Helen vein is vertical and strikes N. 86° W. or parallel to the Mickey Breen vein, with which it is almost identical in width and type of vein matter. The Royal Consort vein is only about six inches wide between the tunnel and its intersection with the Helen, beyond which it widens to eighteen inches. The Helen vein is 18 to 24 inches wide and some good shipping ore has been stoped from it at a point about

20 feet east of the Royal Consort intersection. On the surface the Royal Consort vein is reported to have a length of more than 4,500 feet and ranges from 10 to 30 inches in width. Three drifts 150, 100, and 80 feet long have been driven on the Royal Consort vein at altitudes 1,200 to 1,800 feet above the Mickey Breen tunnel. Carload shipments from these shallow workings were reported to contain from 30 to 300 ounces in silver to the ton, some gold, and as much as 10 percent copper.

The Mickey Breen vein was not traced eastward from the mine during the recent work. Ransome⁶¹ considered the Happy Jack mine to the west to be on the Mickey Breen vein. This mine was not examined during the present survey but other mapping indicates that the Mickey Breen vein does not extend far to the west or down into the quartzites and that it is not connected or continuous with the Dunmore lode. Instead, field mapping points to the Mountain Monarch vein as being the eastward continuation of the Dunmore fissure.

The Mint reports show an output valued at \$105,571 between 1890 and 1892. The only output from the Mickey Breen mine since 1900 was in 1903 when 40 tons yielded 10 ounces of gold and 4,000 ounces of silver.⁶² Private reports estimated in 1917 that ore worth more than \$300,000 had been shipped from the Mickey Breen group, three-fourths of it coming from the Mickey Breen deposit.

Mountain Monarch Mine

The Mountain Monarch mine (designated Monarch on pl. 1) is included in the Michael Breen group of claims. The lower adit is located about 650 feet up the Mineral Point road from the Mickey Breen mine at an altitude of 9,776 feet. This lower or No. 2 adit is a curving crosscut intersecting the Mountain Monarch vein at a distance of about 285 feet from the portal. The No. 1 level is a drift 217 feet

⁶¹Op. cit., p. 197.

⁶²Henderson, C. W., U. S. Bur. of Mines, Records of the Mineral Production and Economics Division, Denver, Colo. The records also include under the Mickey Breen the shipments from the Mountain Monarch mine.

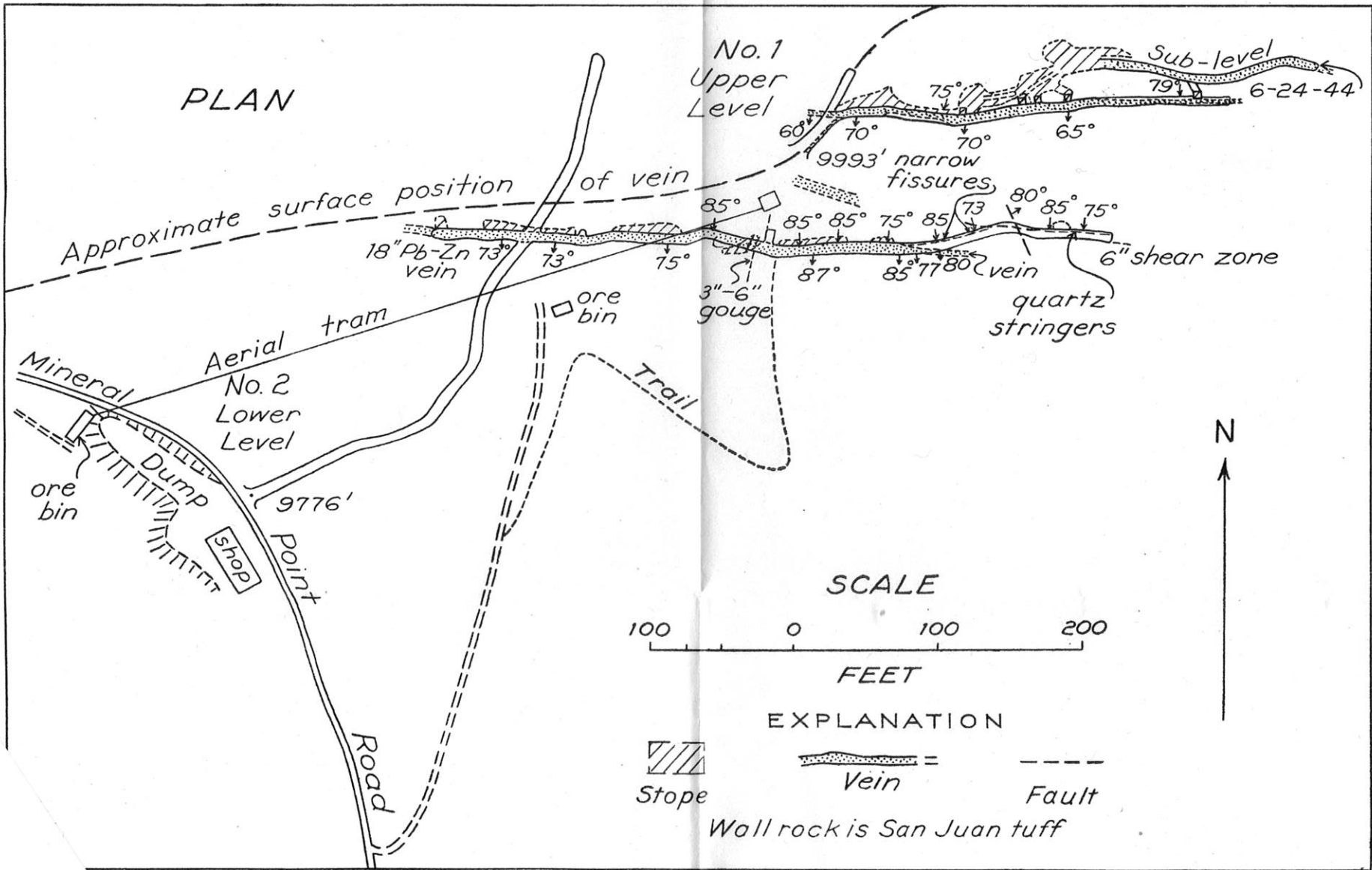


Figure 14. Plan and section of the Mountain Monarch mine.

above the No. 2 level. The vein strikes generally east, but it turns slightly to the north or south locally. The dip is 65° - 85° S. with the steeper dips generally on the lower level (see fig. 14). The vein is five to ten feet wide and is marked by heavily gouged walls. The minerals of the vein are quartz, sphalerite, galena, chalcopyrite, pyrite, and locally a mixture of fine micaceous hematite and chlorite with lesser quantities of rhodochrosite. A very little huebernite was contained in the ore coming from the sublevel in June, 1944. Locally the wall rock adjacent to the vein is heavily impregnated with pyrite. In general the sphalerite and galena are fine- to medium-grained and closely intergrown.

During 1942 the No. 2 tunnel was cleaned out in order to sample the vein and to prepare a station from which to raise to the ore shoot that was mined from the No. 1 level. During 1943 a 69-foot raise was driven from near the east end of the No. 1 level, and about 150 feet of sublevel drifting had been done by June, 1944. This sublevel drift connected with the old stopes at its west end (see fig. 14). Good base-metal ore was exposed for the full length of the sublevel, and the ore shoot ranged from one to seven feet in thickness. The ore seems to rake about 45° to the west. In the older stopes on the No. 1 level the ore shoot partly coincides with a northeast turn in the strike of the vein, but the ore in the sublevel shows no particular relationship to the strike or the dip of the vein. On the No. 2 level the best base-metal ore is in a 6-inch to 18-inch vein lying along the hanging wall and continuing for 60 to 70 feet in the vicinity of the crosscut tunnel.

The only reported output from the Mountain Monarch mine has been since 1900.⁶³ According to E. W. Creel⁶⁴ all of the output given on page 376, although recorded under the Mickey Breen, is from the Mountain Monarch.

⁶³Henderson, C. W., U. S. Bur. of Mines, Records of the Mineral Production and Economics Division, Denver, Colo.

⁶⁴Oral communication.

OUTPUT OF METALS FROM THE MOUNTAIN MONARCH MINE

| Year | Tons | Gold (ounces) | | Silver (ounces) | | Copper | | Lead | | Zinc | |
|------|-----------------|-------------------|---------|------------------|---------|------------------|---------|---------------------|---------|---------------------|---------|
| | | Total | Per Ton | Total | Per Ton | Pounds | Percent | Pounds | Percent | Pounds | Percent |
| 1906 | 51 | 2.27 | .04 | 227 | 4.4 | 62 | .1 | 2,123 | 2.1 | 2,344 | 2.3 |
| 1910 | 19 | 1.95 | .10 | 314 | 16.5 | 389 | 1.2 | 6,280 | 16.6 | ----- | ----- |
| 1913 | 151 | 29.01 | .19 | 1,694 | 11.2 | 2,598 | .9 | 23,792 | 7.9 | 74,431 | 24.7 |
| 1914 | 29 | 8.43 | .29 | 968 | 33.3 | 1,550 | 2.7 | 8,196 | 14.1 | ----- | ----- |
| 1914 | 200 | 4.39 ¹ | ----- | 678 ¹ | ----- | 603 ¹ | ----- | 4,581 ¹ | ----- | 18,246 ¹ | ----- |
| 1917 | 16 | 1.63 | .10 | 166 | 10.8 | 244 | .8 | 9,231 | 28.8 | ----- | ----- |
| 1926 | 37 | 1.11 | .03 | 315 | 8.5 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1930 | 80 | 1.10 ² | ----- | 365 ² | ----- | 472 ² | ----- | 12,544 ² | ----- | 2,160 ² | ----- |
| 1931 | 100 | (Test | run at | Sutton | mill | no figures) | | ----- | ----- | ----- | ----- |
| 1939 | 21 | 5.25 | .25 | 149 | 7.0 | 101 | .2 | 7,890 | 18.8 | 17,958 | 42.8 |
| 1940 | 50 ³ | ----- | ----- | 327 ³ | 4.6 | 227 ³ | .2 | 13,043 ³ | 13.0 | 4,883 ³ | 4.9 |
| 1941 | 27 | ----- | ----- | 167 | 6.2 | 108 | .2 | 12,241 | 22.7 | ----- | ----- |
| 1942 | 40 | .80 | .02 | 212 | 5.3 | 768 | .9 | 11,200 | 14.0 | 13,600 | 17.0 |
| 1943 | 405 | 15.60 | .04 | 1,558 | 3.8 | 2,917 | 3.6 | 83,006 | 10.5 | 24,543 | 3.0 |
| | 1,226 | 71.54 | | 7,140 | | 10,039 | | 194,127 | | 158,165 | |

¹From 27 tons of concentrates.

²From 12 tons of concentrates.

³From mill heads, 11 tons concentrated.

Eurades Mine

The Eurades mine is located at an altitude of 11,008 feet on the Mineral Point road, about four and one half miles from the State bridge on U. S. highway 550. In the twenties the Eurades Mines Co. incorporated several properties into what is termed the Eurades group. This consisted of 28 patented and eight or more unpatented claims laid out in several parallel blocks of north-northeasterly alignment. Described here are the Des Ouray tunnel or mine, the Benack mine (upper and lower tunnels), the Wewissa mine, and Republican tunnels. It also appears that the Sunset mine was included in the group, but this mine is described with those of Engineer Mountain. The drifts, raises, and crosscuts of the Eurades mine aggregate over 6,000 linear feet. Surface improvements consist of about 600 feet of road to the lower Benack tunnel, an office and bunkhouse on the Mineral Point road, and several dilapidated buildings at the lower and upper Benack portals. Only the lower Benack tunnel was open in 1942, and it could be entered only as far as the raise from the Des Ouray level. The latest work done on the group was at the lower Benack tunnel in the early twenties.

The lower Benack tunnel at an altitude of 11,034 feet, the upper Benack tunnel at an altitude of 11,413 feet, and the Wewissa at an altitude of 11,688 feet begin on the same vein. This vein strikes N. 23°-28° E. and dips 50°-70° E. The lower Benack tunnel leaves this vein about 100 feet from the portal and follows a vein that curves easterly from N. 35° E. near the portal to N. 80° E. at its junction with the branch vein through the Des Ouray raise. The dip of this curving vein is 50°-55° S. The walls of the drift are highly altered but rather sharply marked with clayey gouge coatings. The thickness is generally two to four feet. The Benack vein is followed by a rather straight drift which branches northeasterly from the curved drift about 300 feet from the portal. This drift is about 530 feet in length but is blocked

by caved debris from a stope about 250 feet from the curving vein. The Benack vein dips 70° E. and is comparable in general character to the curving vein. About 470 feet from the portal along the curving vein a short branch drift follows a high-grade base-metal stringer for about 75 feet to the top of the 25-foot raise from the Des Ouray level. The stringer consists of galena, chalcopyrite, and sphalerite and is from three to eight inches thick. It is undoubtedly the same vein that was followed northward for about 250 feet in the Sampson drift just beyond the main turn in the Des Ouray tunnel (see fig. 15).

Because of the inaccessibility of the workings of this group in general, and because the ground was north of the topographic base used for field mapping, it is not possible to present a very complete report of the geology of the deposits. Andesite flows like those of Mineral Point are overlain by banded latite flows similar to those south of Mineral Point. In one place along the cliffs east of the Republican tunnels the banded latite appears either to fill a depression in the andesites or to intrude into them. The principal rock at the lower workings is dense latite—part of a plug similar to those along the east side of Mount Abrams (see pl. 1). Much of the development has been in this latite plug, and the curved vein may bear some relation to this mass as may some of the other mineralized fissures.

The Republican vein, although only poorly exposed, can be seen from the three tunnel bearings (see fig. 15) to have essentially the same strike and dip as the Benack and Sampson veins. There are, therefore, three principal veins with parallel dips and strikes in the mined part of the group. The Benack and Sampson veins appear to be terminated or at least strongly interrupted by the southward dipping curved vein of the lower Benack tunnel.

Much of the inducement for developing the Benack and Des Ouray mines appears to have lain in the high-grade ore found in the Wewissa mine. Early output from the Wewissa

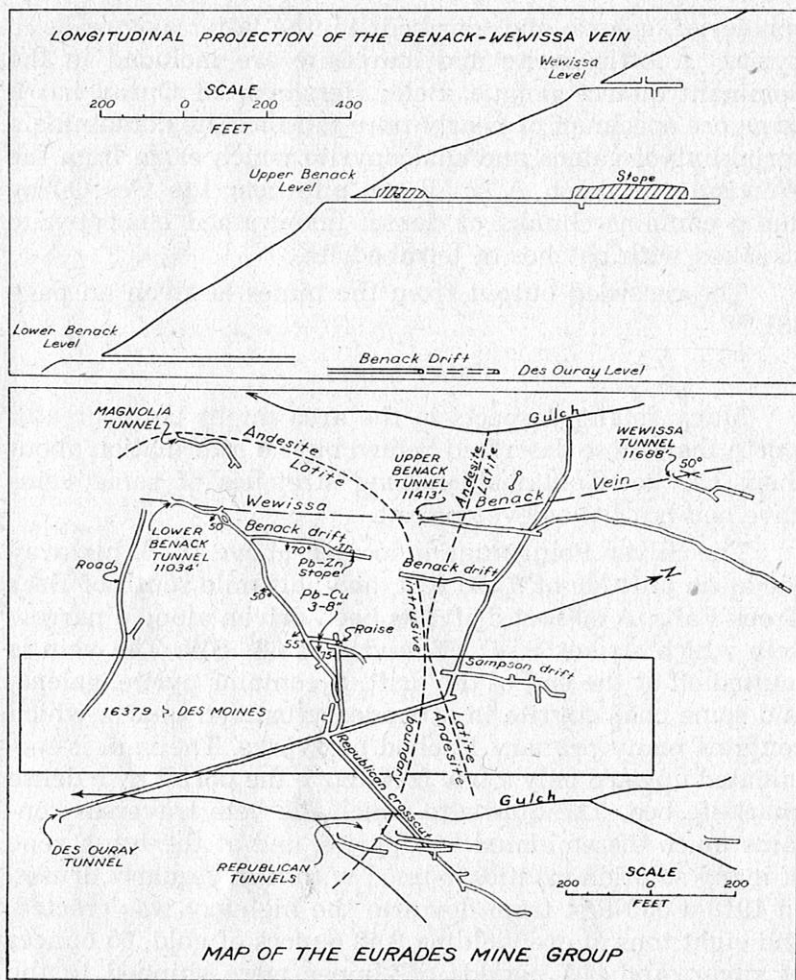


Figure 15. Plan and section of the Eurades mine. (Modified from surveys by Richard Whinnerah and C. E. Wilfley.)

is reported to have yielded \$50,000 net, the crude ore being reported to have contained 0.2 ounce of gold and 40-100 ounces of silver to the ton, 2-4.5 percent of copper, 30-50 percent of lead, and 2-10 percent of zinc. The ores in general were dominant in lead. The dump still contains some

sphalerite, galena, and tetrahedrite, the latter as streaks in pyrite. A little barite and marcasite are included in the dominant quartz gangue. Belle Hersinger of Ouray has a large ore specimen of nearly pure tetrahedrite containing a sprinkling of galena and chalcopyrite which came from the Wewissa ore shoot. A small ore pile near the Des Ouray dump contains chunks of dense, fine-grained chalcopyrite streaked with patches of tetrahedrite.

The recorded output from the mines is given on page 381.⁶⁵

Other Mines

Many small prospects in the area might be of greater worth than those described below, but no information about them has been obtainable. Long stretches of some veins have had but little development.

The Silver Point mine is located above U. S. highway 550 at an altitude of 9,180 feet, one-half mile south of Bear Creek Falls. A 60-foot drift has been driven along a narrow vein which strikes S. 47° E. and dips 68° SW. The vein is faulted off at the end of the drift. It contains pyrite, galena, and some chalcopyrite in a banded crustified quartz which contains many primary leached boxworks. The vein is terminated upward only a few feet above the portal by a dense quartzite bed. The quartzite which the vein traverses contains much disseminated fine pyrite, and at the top a zone of many solution cavities is lined with heavy quartz druses. In 1918 a 550-foot tram down to the highway was erected, and eight tons of ore yielding 0.40 ounces of gold, 65 ounces of silver, and 807 pounds of copper were shipped to the smelter. In 1919 a shipment of six tons yielded 0.23 ounces of gold, 25 ounces of silver, 211 pounds of copper and 117 pounds of lead.

The Gertrude prospect is located along the base of the San Juan tuff cliffs on the west side of Iron-ton Park. Its altitude is 9,685 feet. The vein prospected is short and tapers from six feet at the short prospect tunnel to six inches in