

MINES OF BOHEMIA DISTRICT

Mineralized Area Containing 225 Square Miles That Resembles Cripple Creek in Formation—Free Gold Overlying Vast Bodies of Base Ore.

BOHEMIA, Or., July 28.—Bohemia mining district is truly the poor man's gold country. Here in the Calapooia Mountains, 24 miles south of Portland by rail to Cottage Grove, thence 38 miles by stage up Row River and Sharp Creek, is a highly mineralized belt of 225 square miles containing enormous bodies of base ore, carrying gold, silver, copper, lead, zinc, galena, the whole covered to a depth of between 50 and 100 feet with a capping of free-milling gold. The judgment of mining men, particularly those who have had their schooling in Colorado, or who have worked in its mines, is that Bohemia is a richly mineralized belt, formation and will surpass it in production. Bohemia is many times larger than Cripple Creek. Its extent, that is, the area, which has been prospectively developed, is 225 square miles. Surrounding this square on all of its sides is the blue bearing ground. Taking in the Blue River country, which lies 50 miles north and south of this part of Western Oregon has a mineral belt which is believed to be 60 miles north and south and 25 miles east and west, an area of 2250 square miles. There is but little difference between Bohemia and Blue River. The rocks of both are wholly igneous and of comparatively recent origin, like Cripple Creek and other parts of Colorado and a great deal of British Columbia. Although andesites and basalts occur in Blue River, the rocks differ from those of Bohemia in being generally more siliceous. Compared with this extensive belt, Cripple Creek's eight square miles make a comparatively small camp. To use the words of a Colorado miner who has come to Oregon to study: "Bohemia has the rock, while Cripple Creek has the practical mining men backed by capital to extract the values."

It would be misleading to designate Bohemia a free-milling country. It is essentially a base camp. The normal base ores are base, carrying high values in gold, copper and lead, which are down at least 200 feet below the surface. The capping of free-milling gold, so welcome to the eye of the prospector and productive by so simple a process as the hand stamp mill of the values that keep him in the field while prospecting for the ore and sink for the other. As no considerable amount of shuffling has been done anywhere, it is not possible to give an estimate of its cost per foot. Working tunnels can be driven hand drilling for \$10 a foot. A 150-foot tunnel on the Noonday will net a depth of 100 feet. On the Henry Clay group in Monte Rico a 300-foot tunnel will give 150 feet of depth. And so it runs throughout the district. Generally the top rock is honeycombed quartz, mixed with solid quartz, but in the Champion, the quartz is almost solid. The quartz hardens, the veins widen and the values of the free-milling rock increase with depth. When the base rock is opened up it is believed that its values and the veins carrying them will increase with depth. Bohemia's gold output this year, including the production of the Musick and Helena mines and ore shipments from properties under development, will be estimated to be \$1,000,000, about that of Cripple Creek in the early 90s. There are 61 stamps in the camp, as follows: Musick, 10; Helena, 5; Noonday, 20; Champion, 10; Long, 2; Harland, 2; Stock, 5; Star, 5; Brooks & Michelson, 2; Hoyt's, 2; and only 10 of these of the Musick and Helena, are dropping continuously. Others are running irregularly and others not at all, because of litigation. There is reason to hope that the Noonday will get out of court before long and start up its 20-stamp mill, and that Mr. Woodruff will resume work in the Champion. It would be a great thing for the camp were these mills in operation. Within another year there will be a great deal more equipment in camp. Helena No. 1 is adding five stamps, the Henrietta three and the Venus, Knott, Helena No. 2 and others are likely to have stamp mills soon.

Broas, and their association with Charles B. Brunson in the development of the great Helena property. While the district slept, many claims were held by relocation. It is related that one claim was relocated 15 times in its many years, and in all this time only 30 feet of tunnel was opened—about half the amount of work that should be done in five years succeeding location. The principal claims of the district are rapidly passing out of the hands of the indifferent and inexperienced and into the control of mining men. J. W. Cook, who became interested in the camp in 1893 and who is still a heavy owner in the Musick, is the pioneer in systematic development. Then came the Jennings Bros., the Brunses and others from British Columbia, and lately Frank J. Harl, George W. Lloyd and others from Colorado. These men tackle mines in a business-like way. They develop their

properties to determine what is in them, and having satisfied themselves of the value and permanency of the properties, seek to interest capital and install equipment. That is the way to make a mining country. The more men like the Jennings Bros., Cook, Lloyd and Harl that Bohemia interests the better for it. An excellent recommendation for these men is that they have come to Oregon to live, to interest Oregon capital as far as practicable in their undertakings, and to share the profits with Oregon people. These gentlemen have been instrumental in organizing the Oregon Mining Stock Exchange, of Portland, which has been an influential factor in directing attention to Oregon mines.

The pressing needs of Bohemia district are railroad connection and a smelter at Portland. It is reasonably certain that the district will have a railroad in a year, but the smelter enterprise is passed up to Portland capital. At present all smelting for the camp is done on Puget Sound. In summer the freighters work 100 a ton taking ore to Cottage Grove, and in winter they take as high as \$12. A railroad could make money at \$3 a ton, although the miners would not object to paying \$2. But \$19 makes a big hole in the ore values. Besides, there are to

also opened by several open cuts of varying depth. The lower and middle tunnels are connected by an upraise and another upraise connects the middle tunnel with the surface. The ledge is rich oxidized ore, and is nine feet wide. Seven feet of this is pay ore, and is hauled at the mill without sorting. The ledge has been opened on the surface by open cuts and tunnels for a distance of 150 feet from the present workings, and proves the same class and grade as is now being taken out. While the entire seven feet gives returns in the mill of 25 per ton, the high-grade streak, which shows continuously in all workings, gives values running several hundred dollars to the ton. The ore averages, mill run, from 25 to 30 a ton, free gold, and a trace of silver.

The vein contains, besides limonite and porous quartz, considerable kaolin, with rare crystals of sericite. This oxidized ore occasionally incloses pyrite, with some sphalerite and traces of galena. The openings follow the course of the vein. The upper level has afforded some fine specimens of 40m gold deposited on quartz and partly buried in quartz. The whole is frequently stained by oxide of iron. For several months past the mine has been producing ore valued at \$100,000 to \$150,000 a month, all of which has been extracted in driving the tunnels, no stop-

ing having yet been done. The total expense of production, including the cost of operating the five-stamp mill, is from \$110 to \$120 per month, or about \$1.50 per ton, leaving a net profit of from \$11.00 to \$12.00 per month. The production will be materially increased after October 1, when five additional stamps will be put in operation. This equipment is necessary as the amount of ore in sight is conservatively estimated at \$100,000. Helena No. 1 is having lumber cut for a new two-story bunkhouse, 20x30 feet, a boarding-house, an office and an assay office. These will be located on a slope of Grizzly Mountain, adjoining the mill. The company employs 15 men, but when the mill is increased to 10 stamps, there will be work for 25 or 30. The Helena Mining Company has a capitalization of \$1,000,000, shares at \$1 each. P. J. Jennings is president, Charles B. Brunson vice-president, R. J. Jennings secretary and treasurer, and David Goodsell attorney.

Helena No. 2. Grizzly Peak's 600 feet separates Helena No. 1 from its companion group, the Helena No. 2, also owned by Brunson and the Jennings brothers. Helena No. 2 is on the east side of Grizzly, in Douglas County, and Helena No. 2 on the west side of it, in Lane County. The vein of the Helena No. 1 opening runs north-west, directly into Grizzly Mountain, and is exposed on the side of the ridge on which the Helena No. 2 is located. Three tunnels, aggregating 150 feet, have been run on the Helena No. 2. The showing is much better than the Helena No. 1, made with the same amount of work, though the rock in the two groups is identical. At 15 feet, free-milling ore was struck that assayed \$106 in gold to the ton. Contracts have been let for 20 feet of tunneling to be done this summer, and if good ore body is opened, a five- or ten-stamp mill will be put on the property. The mill site, on Champion Creek, is expected to increase somewhat with the abundance of water and wood, and being out of the line of deep snow.

The Musick. The only mine in the southwest portion of the field that has been operated continuously for a number of years is the Musick mine, at the base of Bohemia Mountain, at the head of Steamboat Creek, which flows into Steamboat Creek, and has about 400 feet of horizontal underground workings, reaching to a depth of nearly 200 feet from the surface, although there is a range of over 300 feet between the lowest and highest points of the mine. The course of the vein at different points carries from north about 40 degrees to 80 degrees west, and its dip lies close to the vertical upon either side. In general its course is that of the Calapooia Mountains. It is quite irregular in width, ranging from 4 to 12 feet, and has rather numerous branches. The vein itself, where best exposed, is made up of three parallel veins, as shown in the following section, taken from near the top of the main shaft.

A is an irregular mass of quartz, permeated and colored with limonite, but contains here and there traces of pyrite. It has a greater width, and generally at this level there is more quartz than is crystallized, filling small druse cavities, and the whole is well covered by red and yellow oxide of iron, and contains numerous rectangular crystal cavities, from the size of a pea to that of a walnut. In C there is the greatest amount of soft limonite, with a small proportion of quartz, and the ore is not rich. Depending to the first level, 40 feet below the surface, the vein continues completely oxidized. At the west end of this level is the middle vein (B) in the figure colored by oxide of iron. South of it is a mass of chiefly kaolin-like sericite, beyond which is the vein marked A. Level No. 2 is 50 feet beneath the surface, at the shaft, but somewhat deeper at the west end. About 100 feet below the surface, at the east end of level No. 2, the full vein is in view, with a width of

about 12 feet. At this level the vein rock is much less rotten and discolored by oxides of iron. Pyrite and chalcocypite are common. Galena and traces of zincblende appear, and although they occur at a number of points throughout the mine, are of much less general distribution than pyrite and chalcocypite. At this level there are associated with the iron oxide about the sulphides numerous white acicular crystals and bunches of leaf carbonate, evidently derived from the alteration of the galena. More or less kaolin is usually associated with the vein, and occasionally it occurs in large masses, but generally contains no considerable quantity of the precious metals. Fifty feet below level No. 2, nearly 200 feet below the surface, is level No. 4, which has been opened for 500 feet. In this level, near the west end, the lower portion of vein C is exposed. It is especially rich in pyrite. Near by the middle portion of the vein is very rich in galena.

Ore that is rich in galena occurs more abundantly in level No. 5, which lies 112 feet below No. 4. Its development is confined to the southeastern portion of the mine, which is only 150 feet below the surface. This level is only 600 feet in length, and the distribution of ore is very irregular. At the east end the vein rock is filled with small nodules of kaolin-like sericite, which form nearly half

the mass. Between the nodules of sericite is quartz containing a considerable proportion of sulphides. At the western end of this level the ore is chiefly galena with quartz and sulphides. Some small cavities are lined with quartz, others with pyrite. On this level galena is one of the most prominent ores. At one point sphalerite is especially abundant, and constitutes the greater portion of a considerable mass. Concerning the ore of the Musick mine in general, it may be said that oxidation extends to a depth of nearly 100 feet, although pyrite is sparingly present above that level. In the quartz and limonite of the oxidized portion, traces of lead, copper and zinc ore of any kind are entirely absent. Below that level, however, the sulphides become locally prominent, and within the limits of this mine the amount of lead and zinc sulphides present appears to increase somewhat with the depth. Kaolin occurs irregularly distributed throughout the vein at all levels. Near the Musick vein, upon which the Musick mine is located, is the northeast, in the California, which has been prospecting for several hundred yards, on a course varying from south 75 degrees to 81 degrees west. It is about five feet in width, and locally contains much black oxide of iron. Croppings show 30 feet of width in some places. The vein shows on the surface for 300 feet. Southeast of the California, upon the right bank of City Creek, is the White Ghost, or Old City ledge, in which prospecting holes were sunk long ago. The rock is peculiar, and quite unlike any

found elsewhere in the region. It consists chiefly of quartz, and tobrimolite, so arranged in places as to give the rock a gneissoid structure, the strike of which is north 55 degrees west. The rock is much fractured, and locally contains considerable pyrite and siderite. The material is associated with and surrounded by fragmental volcanic material, which suggests that this was once the center of volcanic activity. The pyritiferous ore ranges from a few dollars to \$20 a ton in gold and silver. Southeast of the White Ghost is the Mystery, which has been more extensively opened. Near the center of the claim is a discovery shaft, to the west of which the quartz contains particles of sphalerite, galena, chalcocypite and kaolin. At a discovery shaft the porous ore is greenish white, due to chlorite, and rusty on the surface. It contains many scales of red hematite. Large scales of hematite occur in the gray quartz, associated with the yellowish green epidote. The fine granular quartz, which has been broken up and brecciated, is full of minute particles of pyrite and other sulphides, while the fragments are first covered with a layer of hematite scales and then covered with quartz crystals. The full length of Musick ore averages about 570 gold to

the ton, and 7 per cent copper and 50 per cent lead. The surface ores were treated for several years in a five-stamp battery, with plates, but without concentration. One year ago a new 10-stamp mill was built and two full-sized Wilfley tables were installed. In the new mill the ore goes through a crusher and is automatically fed into the battery. Amalgamation takes place in the battery, and on the outside silvered plates. The capacity of the mill is 25 to 30 tons a day. Concentration is four tons of ore concentrated into one ton. Concentrates are worth \$100 per ton or \$40 per ton of ore milled. Since 1892 the Musick has produced \$150,000 gold. Confident of the future, the owners of the Musick are undertaking development on an extensive scale. They are planning to cut a big tunnel, through Bohemia Peak, from its western slope, to tap the lead at a depth of 1500 feet, which will be 80 feet lower than the present lowest level. The tunnel will be 350 feet long, 300 feet, will have two tracks, and will cost, exclusive of machinery, \$25 a foot, or a total of \$25,000. For its making machine drills, run by compressed air, will be used. The tunnel has already been begun on the Hazel claim, on the west side of Bohemia Peak. Its extension will cut a junction of three veins, running through the Yucon, California and Den-

ance claims. The ledge at the junction is believed to be 100 feet wide. The Musick takes its name from James A. Musick, who located the Defiance claim for himself and the Los Angeles for A. H. Davis, of Los Angeles, in 1891. Through Mr. Davis, J. W. Cook, of Los Angeles, and O. E. Brady, of San Francisco, became interested. In 1891 Mr. Cook bought out Mr. Davis' interest, and in 1892 Mr. Musick's. A five-stamp mill was put up in 1892, and increased to 10 stamps in 1893. The claims forming the Musick group are the Defiance, California, White Ghost, Mystery, Alpharetta, Los Angeles and Ajax, in Douglas County, and the Butte, Idaho, June, Hazel, Yucon and Halifax, in Lane County. Big Development on Elephant Mountain. The programme of development which the Consolidated Mines Corporation, Limited, has outlined will go far toward increasing the production of Bohemia and spreading its fame as a great mining camp. This is a Portland corporation, which has selected Elephant and Adams Mountains, taking in the summits of both, as its field of operation. Its officers are Hon. George W. Holcomb, president; Frank Dooley, vice-president; A. Mathar, treasurer, and Reginald W. Thompson, secretary. E. S. Adams, a mining man of practical experience, is superintendent. The company has seven claims, five on Elephant Mountain and two on Adams Mountain, and mining men pronounce them the making of a great property.

350 feet; Mountain Lion, 125 feet; Elephant, 50 feet; Fissure, 60 feet. The Elsie Dora shows an ore body about five feet wide the entire length of the tunnel. The tunnel was started in ore, and is still in ore. The rock is copper and galena, carrying gold, and taken from the entire width of the vein, assays an average value of \$24 per ton, smelter test. Of this amount, \$2 is in gold and silver, \$12 in copper, and \$14 in galena. No smelter test has been made of Elephant ore. Assays run as high as \$18 per ton in gold and copper. The vein is eight feet wide. On the Fissure the vein is four feet wide, and the rock carries free gold. Assays average about \$10 gold to the ton. The ores in all the claims except the Fissure and the Henrietta are base and suited to smelting. To treat them the company will build a 30-ton smelter, costing \$800, on Elephant Mountain. It will not be a custom smelter. For the Henrietta a three-stamp mill has been ordered, and is at Cottage Grove awaiting shipment. Another improvement contemplated by the company is the building of a new quarters on a mile long from its property to the Cottage Grove wagon road. Superintendent Adams has great confidence in Bohemia's future as a base camp. He says the normal base ores are all base, carrying copper, silver, galena, lead and zinc in combination. He says from 7 to 9 per cent is not an overestimate of the amount of copper in the ore.

The Knott claim. The Bohemia, known throughout the district as the Knott, was the first claim upon which mining was fully undertaken. In 1873 it was equipped with a five-stamp mill, which was operated for about four years. It is one of many locations on the slopes of Grouse Mountain, and has been more extensively worked than any other of that vicinity excepting the Noonday and the Champion. The altered rock penetrated by the two shafts—one 78 feet and the other 54 feet, sunk years ago—is brecciated, and consists of quartz, kaolin and oxide of iron, and does not contain much of the sulphides. The same sort of material occupies a number of acres on that portion of the hill, and extends southeast into the Gray shaft, where its strike is north 61 degrees west, and its dip 70 degrees southwest. The Bohemia is of old-style measurement—100x200 feet. Bird Flanner located the claim in 1872, and sold it to Joseph Knott, of Portland. Mr. Knott immediately built 15 miles of road, up hill and down hill, without regard to grade, and shipped in a five-stamp mill, consisting of stamps and plates. The rock was crushed by hand and fed to the battery by hand. Notwithstanding the crudity of the machinery, Mr. Knott is reported to have cleared up \$125,000. Only the richest ore was worked, and there is rock on the old dump today that carries high values in gold. The present owner of the Bohemia is Mrs. J. P. Finlan, a daughter of Joseph Knott. Mrs. Finlan was in the district 20 years ago, when her father was working the Bohemia. After patenting the claim in 1891, she discontinued work on it, and the timber in the shafts rotted, and the buildings put up by her father in the early days disappeared plank by plank, to take form again in the home of some thirty prospectors. Last May Mrs. Finlan decided to reopen the property, and returned to the district, accompanied by her son, Douglas Ladd, and daughter, Mrs. William C. Meagher. Mrs. Ladd and Mr. Meagher were also of the party. As the shafts could not be reopened without retimbering, it was decided to sink anew about 10 feet from the west line of the claim, and O. G. Gilbertson, a former Cripple Creek miner, was given the contract for the work. At a depth of 20 feet, a three-inch vein of sugar-loaf quartz, containing free gold, was struck. At 24 feet the ledge had widened to 2 1/2 feet. Samples taken from across the ledge at this depth, sacked and sent to four different assayers, gave values of \$29, \$25, \$19 and \$5 gold to the ton, an average of \$27.75. At a depth of 40 feet the ledge had widened to 20 or 30 feet, and was still free-milling, with indications that it would increase in width with greater depth. Mr. Ladd thinks the free-milling ore will continue to 200 or 300 feet below the surface. This is higher than the run of estimates of the extent of the free-milling capping of the Bohemia district, but the region has shown up so wonderfully of late that almost anything

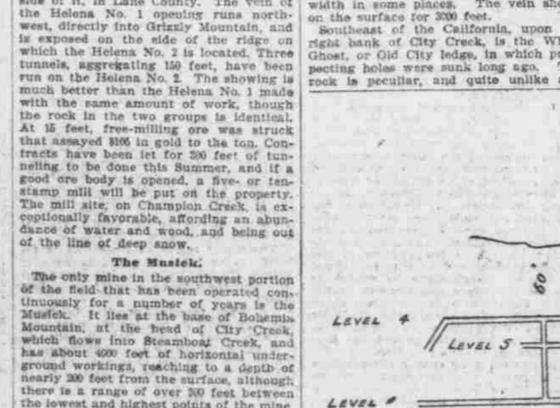


A STAMP MILL IN BOHEMIA DISTRICT.

may be expected of it. The collar of the shaft is 5500 feet above sea level. There is no doubt that there is an enormous body of rich ore on the Bohemia. Mr. Gilbertson is confident that a lead can be opened up for a width of 25 feet the entire 1500 feet of the claim's length. Near the southern end of the claim, 100 feet from the new shaft, the creek has washed down to bedrock and exposed a section of the ledge, from which colors can be panned. The exact width of the lead can not be determined until crosscutting begins. The rich strike on the Knott has attracted attention throughout Oregon, and no one comes to Bohemia without visiting the mine. Mr. Ladd has been very accommodating, and has permitted rather general inspection of the ore, and has not denied requests to have extended depth of being lowered into the shaft. While this delays work, Mr. Ladd believes that for the good of the camp through publicity should be given to the strike. Next year Mrs. Finlan will build a five-stamp mill on the Bohemia. She is now considering the advisability of organizing a corporation and issuing stock. The Champion. The Champion mine, known also as the Hartford, is located on the very crest of the ridge, a little more than a mile directly east of Bohemia, between Fairview and Grouse Mountain. The ore, when the plant is in operation, is carried on a tramway 300 feet long down the northern slope to a 20-stamp mill on Champion Creek. The mine having reached to a depth of but little over 100 feet, where deeper has not passed beyond the zone of oxidation, and thus far only a small per cent of concentrates has been saved. A sample of these concentrates yielded upon assay 8.29 ounce of gold, and 3.4 ounces of silver per ton. The mine has been worked almost wholly from one level, 60 feet in length, ranging from 56 to nearly 200 feet beneath the surface. At the face of this level, where the vein had a width of four feet, it consisted chiefly of rotten quartz permeated by limonite. Occasional masses of kaolin-like sericite occur in the vein, but they are not conspicuous. In this mine, as far as developed, there are few spots where pyrite occurs, and distinct bodies of the other sulphides have not been found, as in the Musick. The oxidation appears to have extended deeper in the Champion than in the Musick, but this is accounted for by the fact

be paid freight rates from Cottage Grove to Puget Sound, and smelting charges. The Calapooia Mountains extend from the Cascade Range to the Coast Range, and from the divide between the Willamette and Umpqua Rivers. From the Cascade Range they extend almost directly west, but as they approach the Coast Range they turn north and become less prominent. The rather low gap which separates them from the Coast Range is passed through by the Southern Pacific railroad, midway between Drasin and Cottage Grove. This gap was once occupied by a stream, carrying the waters of the Umpqua northward into the Willamette, before the Umpqua had found its

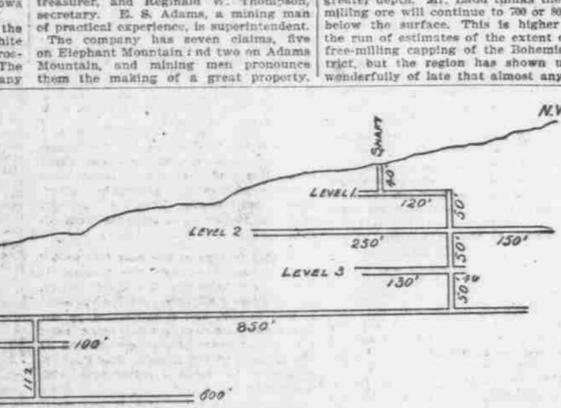
point of two about gold, but it remained for Mr. Brunson to stick to the work and uncover the ledge which has done more than anything else to make Bohemia the promising camp it is today. The company owns six claims—Helena, Loreta, American Boy, Early Mountain, Chief and Verde, comprising 110 acres. The principal development is in the Helena and Loreta claims. The Helena ledge is opened on the surface from Hornshaven Creek, over Grizzly Mountain and down on the other side to Champion Creek. The company owns 8000 feet of this ledge, and has driven three tunnels, 400 feet on the lower, 250 on the second, and 100 feet on the third. The ledge is



GENERAL SECTION OF THE MUSICK MINE.

The principal development is on the Elephant Mountain claim. Only assessment work is being done on the Dulay, but the others are being pushed ahead. On one of the Adams Mountain locations only a assessment work is being done, but on the other one—the Henrietta—a shaft has been sunk 30 feet, through honeycombed quartz resembling that of the Helena. Assays on it range from \$14 to \$18 to the ton. The 'our claims on Elephant Mountain, on which work is being pushed, have been opened to a length of 100 feet all told. In detail the amount of tunneling on each claim is: Elsie Dora,

Section of the Musick Vein. The diagram shows a cross-section of the Musick vein, with labels A, B, and C, and a scale of 12 FEET. It illustrates the complex structure of the vein, including different layers and mineral compositions.



GENERAL SECTION OF THE BOHEMIA MINING DISTRICT.

found elsewhere in the region. It consists chiefly of quartz, and tobrimolite, so arranged in places as to give the rock a gneissoid structure, the strike of which is north 55 degrees west. The rock is much fractured, and locally contains considerable pyrite and siderite. The material is associated with and surrounded by fragmental volcanic material, which suggests that this was once the center of volcanic activity. The pyritiferous ore ranges from a few dollars to \$20 a ton in gold and silver. Southeast of the White Ghost is the Mystery, which has been more extensively opened. Near the center of the claim is a discovery shaft, to the west of which the quartz contains particles of sphalerite, galena, chalcocypite and kaolin. At a discovery shaft the porous ore is greenish white, due to chlorite, and rusty on the surface. It contains many scales of red hematite. Large scales of hematite occur in the gray quartz, associated with the yellowish green epidote. The fine granular quartz, which has been broken up and brecciated, is full of minute particles of pyrite and other sulphides, while the fragments are first covered with a layer of hematite scales and then covered with quartz crystals. The full length of Musick ore averages about 570 gold to

THE BOHEMIA MINING DISTRICT FROM TOP OF FAIRVIEW, TAKING IN BOHEMIA PEAK.