



Devoted to the Mining, Lumbering and Farming Interests of this Community, to Good Government, and Hustling for a Grub Stake.

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Mines and Mining

Devoted to Bohemia Notes and Items of general interest to Mining Men.

AS SEEN BY JAMES P. KIMBALL.

What Another Writer Thinks Of The Great Bohemia Mining District.

Railway connection with the Southern Pacific system will serve to bring the Bohemia mining district of Lane and Douglas counties, Oregon, to new and increasing importance. Covered by not less than 2000 mining claims of record, some of which, as may be assumed, are fractional and some relocated, this district has been wrought since 1891 for free milling products from the oxidized zone of several well-known lodes. Mineral discoveries date from the year 1858. The district numbers about 40 head of stamps.

Development of its normal products in the form of heavy sulphides of the base metals has thus far been retarded for want of an outlet for shipping products—practicable only to the west. As all operations are still on the opposite side of Calapooia mountain at elevated points, two wagon roads from the west, the one a 9 per cent grade to the Musick, and the other a steeper grade to the Helena, have hitherto sufficed for free-milling operations. Of such rude facilities the best has been made—not without serious difficulties from excessive precipitation, especially in the winter months. Snow, however, rarely reaches the bottom.

Transportation of concentrates proving impracticable except in the short dry season, their steady production from oxidized or free-milling material has been suspended. Neither surface space nor capital has been found for their accumulation—in adaptation of railway facilities. Such facilities will soon be near at hand on the completion of the Oregon & Southern railroad now building from Cottage Grove to the western base of Calapooia mountain, and thence up one of its deeply sculptured basins. Extraction of a large tonnage of shipping ores practically "in sight" awaits its service. Concentrating operations yet to be located at the base of the mountains will depend largely upon facilities afforded by this railway.

Several important timber belts outside the Cascade forest reserve will be reached by the railway, and will contribute to its traffic. The timber of the mining district itself is mainly protected from logging by mineral locations, and by adverse topography, if not by forest reservation.

The Bohemia mountains may briefly be described as culminating crags of Calapooia mountain, the survival of a great volcanic mass as left by erosion in the form of a narrow and tortuous ridge with numerous radial spurs or ramifications. From the summits at elevations of from 5000 to 6500 feet erosion has advanced in all directions toward the base. Deep V-shaped basins have thus been sculptured on the west slope descending into the Willamette and Umpqua waters.

The whole mass, essentially andesitic in character is traversed from base to base by numerous powerful mineral lodes in nearly vertical attitude, with a N. W. S. E. course. These occupy in part great clear-cut fissures parallel to the divisional partings, and in part bordering shearing belts defined by planes of least resistance—all more or less separated—thus constituting divisional planes, and walls, slickensided in places, and more or less warped. Unequal separation along with slight displacements of divisional planes give unequal sections, expanding up to 10 feet as in the Helena and 12 feet as in the Musick. Between divisional planes the filling is more or less brecciated in ratio of sectional exposure. Mineralization of brecciated parts also appears in ratio of the exposure of breccia. Segregated quartz occupies the less brecciated parts, and is more or less interstitial throughout all brecciation. Both quartz and breccia are unequally mineralized with the metallic sulphides, carrying different ratios of gold and silver, but generally as far as proved uncommonly high. Mineralized exposures or parallelism of lenses and plates constitute ore bodies, of which three have been opened by drifts and stopes in the Musick within a development of 1100 feet longitudinally and 300 feet vertically. One of these has a length of at least 350 feet, faces of drifts still being within its limit. Another is about 100 feet in length, and the third about 300 feet. As far as wrought these are in divisions—also three in number. Outcropping extensions of the lode are highly mineralized for 3000 feet to the southeast and at least 1000 feet toward the summit of Bohemia mountain, beyond which the top of the lode is concealed. Serpentine clay is a common occurrence from decomposition of andesite, marginal to divisional planes and walls.

The Helena lode is distinctly traced for over a mile, and opened at this interval at several elevations. In October, 1891, a remarkable ore body was opened from the east slope of Grouse summit near the present mill at a depth of 75 feet. Its limits in any direction have not, so far as I am informed, yet been reached, though opened for a length of over 200 feet in the level by which it was penetrated. An up-dip on the outer edge follows the ore body to grass roots. When examined by me in November, 1891, this lens, 72 feet beyond the same edge, presented a face of 8 feet, 10 inches—including 7 1/2 feet of shipping ore as run-of-mine. The average assay value of gold in this product at that time was \$125 per ton. Divisional planes in the Helena so far as exhibited do not compound the lode by intervention of andesite as in parts of the Musick. A single plane, however, divided the lode into two parts, one a heavy galeniferous product, the other a dry ore, but nearly equally rich in gold.

The metalliferous ores of the region are of several types—according to the relative distribution of the several sulphides and their relative enrichment with gold. The oxidized zone is characterized as usual by hydrochemical elimination of sulphides of copper and lead. Vannings from such material consist mostly of antiferrous pyrite. Varying doubtless in ratio of the original sulphides, oxidized ores widely differ in gold contents from locally and inordinately high tenor down to moderate richness. Low grades rarely fall below a value of \$10, while \$16 may be taken as a fair average. The depth of the superficial zone also varies as determined, first, by local erosion, and second, by circulation of underground acidulated waters. Intermediate products are apt to occur next below the oxidized zone. This zone is thin in the Musick lode and generally wanting. In the California it is developed to an unknown, but to no great extent. In the Champion it has a deep development; in the Helena an unequal development following a sharply undulating line, at which sound or unaltered sulphides make their appearance, sometimes at the surface as generally in the Musick.

Heavy sulphides mostly galena are often of shipping grade, and richly impregnated with gold. The lower grades constitute concentrating material. Pan concentrates reduced to the specific gravity of dense or shipping material are also rich in gold, but even from material at equal depths prove of somewhat less value, probably from loss in siliceous tailings. The shipping product of the Musick from the lower levels averages about \$70 in value of gold; and of the Helena about \$125. Net values of Musick vannings in gold after elimination of amalgamating material under the stamps may be taken at about \$45; of Helena vannings of the same type about \$40; the latter from ores giving \$26 of gold by pulp assay. No shipment of Musick high-grade ore has yet been made. Typical samples, however, assay nearly as high in gold as the best product of the Helena in car lots.

This brief general statement of values refers, of course, to present developments. The oxidized zone of the Helena lode on the east slope of Grouse summit is still good for a reasonably long supply of milling material. That of a parallel lode remains untouched. The deepest development of the oxidized zone is observed in the Champion lode.

All stopes in the Musick have only been partially wrought for oxidized or amalgamating products. Unaltered ores have been left standing as reserves. Space forbids anything like a detailed description of the Bohemia mines, the development of none of which has so far advanced as to furnish all the factors of several important problems, like relative zones of enrichment with the precious metals relative distribution of copper sulphides along with galena and sphalerite, or distribution, entire shape and full size of ore bodies. Zinc has not yet been found in deleterious proportion.

In printed reports on the Helena and Musick mines such practical details have briefly been given as could be ascertained as late as November last. Some 20 locations have since been

collected as a third group under the name of Calapooia Mining & Tunnel Company—intermediate between the Musick and Helena groups. Each group is the property of separate corporations, of which Mr. P. J. Jennings of Portland is president. To his sagacity and energy the recent development of the Bohemia District is chiefly due.

The Calapooia group, including the Champion group of 10 locations, lie in a body at the head of Champion basin, and occupy the west side and summit of the culminating ridge.

The workings of the Champion and Broadway, together with discovery and representation developments, reveal the occurrence of several powerful lodes parallel to the general system of lodes well exhibited in the Helena and Musick groups, and all of the same type.

This group assumes definite importance, however, in advance of extensive development below the oxidized zone, as the key to deep development of the Musick and California lodes by means of two tunnels, or of an adit from the head of Champion basin at the terminus of the railway.

The Calapooia is designed as immediately a developing proposition for the driving of at least one deep tunnel through to City Creek basin, giving access to the Musick-California system of lodes, and egress for their products—thus obviating surface transportation over the summit. It is designed to drive on the Champion lode, and after establishment of suitable lines to crosscut the whole system of lodes between the Helena and Musick-California systems. Milling material will incidentally be found for the present Calapooia 20 stamp mill. By the addition of vaniers valuable concentrates can be immediately produced.

For 20 miles on the upper waters of the Willamette, which is followed by the railway, are distributed falls and rapids adaptable to water power sufficient for air compression and for electric energy for all milling and milling purposes, and even for locomotion.

Advanced operations for the production of smelting ores and other shipping products in the form of

concentrates, will be mainly by drifts and cross-cuts from which the sum of rise or back will be up to 2000 feet.

The Helena is now driving a low drift from Champion basin, eventually to connect with the recent openings on the opposite side of Grouse summit, at higher elevations.

Railway, tunnelling and milling improvements will thus serve to change the Bohemia Mining District from a free-gold camp to essentially a producer of auriferous smelting ores both wet and dry. Galena has now come to be the most conspicuous base product within the present development of the Musick and Helena lodes. Chalcocyanite is developed in admixture with the base sulphides in places up to commercial values. Quantitative determinations of copper have been too few for practical purposes. Two hundred and ninety tons of Musick concentrates smelted at Tacoma in 1898 averaged 9.53 per cent of copper along with 12.3 per cent of lead, \$24 of gold and \$2.82 of silver. These were produced from partially oxidized ores. Much of the galeniferous product of both mines as far as yet extracted has proved up to shipping grade without spalling.

In the Musick lode and in the Helena as far as wrought, the bulk of the lode is mineralized to separating grade even between ore shoots, except in constricted parts, which thus far have proved few and short. The local industry will therefore develop into shipping of high grade ores, and of reduction products in the form of concentrates direct from the ore without amalgamation. The volume of the industry will of course depend on mining development and milling plant. These in turn will be in measure of the application of capital. Resolute and extensive development of the Bohemia mines, as now practicable with railway transportation at hand, will go far toward the establishment of a smelter in the Willamette valley—perhaps, as long contemplated near Portland, where may readily be assembled the various smelting products of Eastern and Southern Oregon, along with Washington or Vancouver coke, fire clay and fluxes.

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