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Item 8

REPORT ON SPANISH BELT.

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Victor Barndt, Trustee,

Sir:

As the location, description and history of the Spanish Belt mines have been fully covered in Fletcher's report of September 22, '07, the following notes deal only with the geology and nature of the ore deposit. Use Fletcher's plat in connection with these notes.

FORMATIONS

The chief rocks of the district are eruptive granite, granitic-porphry and Paleozoic limestone and shales. Their general trend is northeasterly and southwesterly and dip 50° to 70° from horizontal to the southeast. Spanish Peak, a mile northwest of the mines, is composed of eruptive granite. On the southeast slope lays 1000' to 1500' of Silurian Limestones and shales, which in turn are covered on the south and east by a wide belt of granitic-porphry, extending several miles out in the foothills. The mines occur in the narrow belt of stratified rocks between these two extensive eruptive formations.

Very great alteration and metamorphosis have taken place in the stratified rocks. The limestones, in their unaltered condition a dense blue rock, are changed to a light grey granular marble, and the shales have undergone even greater transformation. These shales, where they have not been disturbed, are a dark to black, soft, talcose rock, devoid of slaty cleavage. In the

vicinity of the mines they have been metamorphosed to a dark grey slatey mica schist and have lost all their original characteristics. so that they now resemble igneous more than sedimentary rocks. Both limestones and shales have been subjected to great compression, shearing strain and volcanic heat, and are intruded with numerous granite porphyry dykes adjacent to the veins.

In the immediate vicinity of the mines are no data to closely determine the relative ages of the two granite formations. The eruptive granite of Spanish Peak is less porphyritic in its nature and relation to the Silurian strata, and is probably older than the granitic-porphyry belt to the southeast. Its habit is plutonic rather than intrusive; while the granitic-porphyry of the foothills in places appears to be intrusive, and again in other places that of an extensive overflow of a granite magma similar in composition to the Spanish Peak granite.

Both granite formations are older than the Tertiary volcanics, for a few miles east of Belmont they are buried beneath Tertiary extrusives.

They are both Post-Silurian, as they cut and invade the Silurian Limestones and shales at many points. It is probable their age may be identified with that general mid-mezozoic disturbance that affected the entire Basin Range region, which would relate them in age, character and condition to the granite-monzonites of Ely, Nevada.

VEIN CONDITION

The Spanish Belt ore deposits are hardly veins in the true sense of that term; but are elongated and flattened lenses

of quartz along contacts and shear zones in the metamorphosed strata. The lenses wedge out horizontally and it may be vertically, and their places are taken by overlapping lenses, forming a "linked" instead of regular vein system. Their walls are mica-schist, marbleized limestone and granitic-porphry.

The vein gangue is principally a thinly bedded, sheared limestone, which has been largely replaced by silica with smaller amounts of flour-spar, calcite and metallic sulfides. The replacement has not destroyed its original stratiform arrangement, but has produced a striped or 'ribbon' quartz from the original rock. The veins are in the main parallel to the strike and dip of the strata and were formed during the process of cooling and crystalization of the igneous rocks, and are thus somewhat later in age than the granites.

The 'Barcelona' vein is the largest of the system; frequently expanding to 50 feet or more in width. It lays beneath and northwest from the other veins and nearest the eruptive granite, and its northwest or foot wall is composed of mica-schist and granitic porphyry. A formation of marbleized limestone 200 feet thick forms its southeast or hanging wall and separates it from the 'Ernst' vein, of which the marble is the foot wall. The 'Ernst' vein is 2 feet to 10 feet wide and made the historic production of the Belt. It has a mica-schist hanging. Both the Barcelona and Ernst veins are closely related to the limestone that separates them, and their gangue stone is in the main a replacement of it; however, considerable shearing and faulting nearly parallel to the limestones is manifest and the veins are connected at points by these displacements.

LIMITS OF SPANISH BELT

With some relative changes in position and width, the Spanish Belt formations extend northwest and east, and southwest of the Barcelona mines for several miles. To the north and east they are traceable to Jefferson Canon, Round Mountain and Belmont, and to the southwest probably to Manhattan.

In reality, the Spanish Peak granite appears to be a domical uplift that has lifted the Silurian rocks from below, tilting them away from a common centre and causing them to form an elliptical fringe around the base of the mountain. Antone Creek to the northeast and Spanish Belt Creek to the southwest are both transverse fault lines, and the areas beyond their limits need not be considered. The description covers only the region about 1 mile in length and 1800 feet in width between these two creeks, comprising a single mining unit properly called 'Spanish Belt.'

CHARACTER OF ORE

The metallic contents of the veins are iron pyrites, galena, zinc-blende, chelcopyrite, silver sulfide and occasional showings of cinnabar. All of these sulfides occur in rather coarse crystalline aggregates disseminated through the gangue. The quartz is light specifically, very brittle and readily separated from the enclosed sulfides, which make it an ideal concentrating ore.

The metallic content of the concentrating ore rarely exceeds 10% of the gangue, thus permitting a reduction 8 to 10 tons of crude ore into 1 ton of concentrates of marketable value. See concentrating test in Fletcher's report.

The former high grade production was almost solid sulfide ore, and it is said that all heavy sulfide ore ever found is very high grade.

CONCLUSION

The presence of the separate sulfides of iron, lead, zinc and silver-copper preclude the possibility of any secondary enrichment from above, and the presence of occasional nests of mercury point to the filling of the veins from below by ascending heated solutions derived from the adjacent igneous rocks; so that both the veins and their ores can be depended upon to extend to great depth with little if any change in their present width and value.

The lenticular nature of the veins, while indicating in places lean ground, at the same time is very favorable to the existence of rich and extensive ore deposits. The known presence of bodies of primary high grade ore, along with much concentrating material yielding a rich profit, makes the reopening of these mines a proposition of great financial promise.

Hot Creek, Nevada, Oct. 20, 1909.

S. F. Hunt

(Signed) S. F. HUNT.