

depth. The ground thus opened up has been found very productive, and has so far given no indication of any decrease of productiveness with depth.

On the east, the Centre Star Mine has developed the vein, speaking generally, for an average distance of 1,000 feet along its length, and to the fourth level, a depth of 431 feet measured on the vein. The main shaft is going down rapidly and has nearly reached the fifth level, located at a depth of 609 feet, measured on the vein. This exploration has exposed two ore shoots, one on the west or main ore shoot, and the other as the east or low-grade ore shoot. Practically all of the pay ore so far discovered, i.e., under present conditions—is contained within the limits of the main ore shoot. The ore of the east or low grade shoot is of an average grade below the present pay limit, but it will be available later on when the costs of mining and treatment are sufficiently reduced. As a rule, the vein exposed outside of the limits of these two shoots is either barren or so low in grade, as to be of no prospective value.

THE MAIN ORE SHOOT.

The main ore shoot is irregular in form, so that its average dimensions and trend will not be clear until the work has extended to greater depths. It appears to have a dimension of 300 to 450 feet along the vein, and is located in the 510-foot space between the shaft and the Le Roi territory on the west. As usual, the vein area included within the shoot-limits carries pay ore in irregular patches or masses, interspersed with barren material or ore too low grade for pay. The different pay ore bodies vary in grade from \$30 down to the pay limit, and range from 5 to 40 feet in thickness. The vein structure is somewhat complicated by numerous dikes and faults.

In the upper levels the shoot has a dimension of 300 feet along the vein, and shows a continuous body of pay ore extending from the surface down to a point between the second and third levels, where it changes into barren material or low-grade ore. At some point between the third and fourth levels, this again changes into pay ore. On the fourth level the shoot has been explored for 450 feet in length, the pay ore bodies so far aggregating over 300 feet of this distance. The block between the third and fourth levels has not yet been explored, and how far the pay extends above the fourth level is at present unknown.

The main ore shoot has yielded almost the entire past production of the mine. This came mostly from the upper ore body, a small proportion having been derived from the shaft and fourth level development work. This production amounts to 31,121 tons, averaging \$17.06 smelter's gross assay value. The average metallic contents were gold, 0.793 ounces per ton; silver, 0.365 ounces per ton; copper, 1.25 per cent. The present mine ore reserves above the third level are estimated as about 100,000 tons, and of an average smelter's gross assay value of \$16.00. As explained, the fourth level ore body cannot be estimated, but its exposures along the fourth level indicate an average smelter's gross assay value of \$12. If it extends to an average height of 50 feet above the level this block will contain 20,000 tons. The ore body is found in the shaft for 30 feet below the fourth level and its dip then carries it away from the

course of the shaft. The fact that the fourth level ore is of lower grade than that in the upper levels is not proof of any permanent change of the shoot with depth. It is probably due to one of the fluctuations usual in the ore shoots of Red Mountain, and it is likely to average up with richer bodies as the shoot is explored to greater depths. In this respect it is not likely to differ materially from the neighbouring Le Roi shoot which is now developed to a depth of 900 feet.

THE EAST OR LOW GRADE ORE SHOOT.

This ore shoot is located about 390 feet east of the shaft. It is explored mainly by old workings, and is also partially developed by the third level. Owing to the fact that only small patches of pay ore have been found within its limits, little effort has been made to define its extent, or to establish the exact average value of its contents by a number of trial shipments. This work was put off to a later date, when reduced cost of mining and treatment would make these contents available. Development, so far, indicate a large ore body, with a dimension of several hundred feet along the vein, and an average grade between \$5.00 and \$8.00, smelter's gross assay value.

DETAILS OF DEVELOPMENT.

First Level.—Same elevation as the top of shaft.

The first or tunnel level is located west of the main shaft. It crosscuts the formation for 100 feet and then follows the vein in ore for 230 feet. The ore is exposed for five and a half feet of its width, averaging \$23.50, smelter's gross assay value. Two crosscuts show a total width of ore of 19½ feet, averaging \$14.40, smelter's gross assay value.

Second Level.—165 feet in depth, measured on the vein.

This level runs west of the Le Roi line. It encounters the ore-shoot 180 feet west of the shaft, and continues in pay ore to a point about 410 feet west. This body is being stoped. The ore is 20 to 40 feet wide, averaging \$16.50, smelter's gross assay value. Three raises connect with the first level above, all being in solid ore of this grade. At 410 feet west, the vein is shifted by a fault, but beyond the fault the pay ore continued for 90 feet to the Le Roi line. This portion is stoped out.

The second level east is an old tunnel, the mouth of which is 870 feet east of the shaft. It cuts occasional areas of low-grade ore, the principal one being the east or low-grade ore shoot located about 390 feet from the shaft. The shoot above the level is exposed more or less by old workings which include a shaft, upraise, and intermediate level, with crosscuts.

Third Level.—304 feet in depth measured on the vein.

The third level west runs to the Le Roi line. From 80 to 140 feet west, crosscuts expose ore 16 feet wide, averaging \$6.00, smelter's gross assay value. At 220 feet west a crosscut exposes ore 34 feet wide, average \$10.00, smelter's gross assay value. At 220 feet west raise No. 386 connects with the second level. The lower half of this raise is low grade, and the upper 60 feet in pay ore. At this point an intermediate drift exposes ore for 135 feet of its length and for its full width, averaging \$16.50, smelter's gross assay