

## MINERAL RESOURCES OF EASTERN OREGON

EXCERPTS FROM THE FORTHCOMING REPORT OF PROFESSOR LINDGREN, OF THE GEOLOGICAL SURVEY.

WASHINGTON, Dec. 28.—During the last five months of 1901, the Geological Survey, at the request of Representative Moody, Waldemar Lindgren, of the Geological Survey, made an extended examination of the gold belt of the Blue Mountains of Oregon. His report, which is soon to be issued, partakes of the character of preliminary or reconnaissance work, but yet goes into much detail, and will be of inestimable value to mineowners and prospectors intending to invest in this region. Because of the importance of this report, and the great assistance it will doubtless be in upbuilding this promising gold district, the following liberal extracts are made:

The State of Oregon contains several gold-bearing areas, widely scattered over different regions. Practically the whole coast is fringed by a belt of auriferous sands which sometimes are rich in fine gold. A second gold field is contained in the older rocks of the southern part of the state, chiefly in Jackson and Josephine Counties, and may be considered as an extension of the gold belt of Northern California. A third auriferous region is that of the Cascade Mountains, extending northward toward the Santiam River and centering in the Bohemia mines. Here the gold and silver appear in veins contained in igneous rocks and have been carried to the surface by hydrothermal action. A fourth mineral-bearing area is reported from the Puget Mountains, in the extreme southeastern part of the state.

But the most important gold field of Oregon is that of the Blue Mountains. It is situated in the northeastern part of the state and extends for a distance of about 125 miles westward from Snake River. Its production is at least three-fourths of the total output of the state. This region, during the last few years, has again assumed the prominent position among the gold-bearing areas of the United States which it held about 40 years ago, when gold was first discovered there.

It was not possible to visit all the mines and prospects contained in the gold belt. The most prominent were naturally selected, but it should be emphasized that the failure to mention any particular deposit in this report is by no means a reflection on it or an indication that it lacks value.

In Eastern Oregon mining is usually carried on under favorable circumstances. Wood, timber and water are ordinarily in good supply. The principal drawback is the distance from railroad lines of the state, and in the highest mining districts the severe climate, as, for instance, at Cable Cove, on the Greenhorn Range, and at Combsburg, near the Snake River. In many cases lack of technical skill has materially increased the difficulties. Men of various professions have been sent out to take charge of mines, instructed by experienced mining engineers. At some prospects, and even at some mines, manifestly unsafe shafts and machinery were found. Still, these mines are greatly improved and many of the mines are now models of their kind. The cost of mining may be taken to vary from \$1 to \$4 per ton in the large mines having considerable bodies of ore to sink shafts, to \$20 to \$30 per ton in the small, shallow workings.

The simplest and most satisfactory ores are those of mainly free-milling character, like the Red Boy, Bonanza and Belle, of Baker County. The cost of mining at these mines is about \$2 per ton, and the ore is sold at \$10 to \$12 per ton. When the ore is roasted and subjected to direct cyanidation, as at the North Pole mine, the expense naturally becomes higher. In the mines which produce large amounts of concentrates or sulphides, which must be shipped to smelting works, the cost of treatment is, of course, greatly increased, freight and smelting charges amounting to at least \$5 per ton. Total cost of ore, besides heavy wagon freight if it must be situated far from railroad, anything between \$10 and \$20 per ton is usually not considered as shipping ore. Frequently the total cost of mining and shipping is \$20 to \$25 per ton.

Last year an attempt was made to run a small smelting plant at Sumpter, but even with the most careful management there are great drawbacks to such an enterprise: the cost of fuel, the expense of coke and the absence of large quantities of suitable copper and lead ore. Smelting of cuperfous pyrite by the pyrite process was for some time successfully carried on at the camp of Mineral, on Snake River.

Regarding the percentage of extraction, exact data are difficult to obtain. It is not probable that any mill at present works closer than 80 to 85 per cent, and many of them fall considerably short of this figure.

## Production of Gold and Silver in Eastern Oregon.

As far as the larger proportion of the production of the precious metals comes from the Blue Mountains, it may be pertinent to give the figures relating to the production of the state as a whole. During the earlier years statistics were very imperfect. Gold and silver were not separated, and, indeed, for a number of years the production of Washington was included in that of Oregon. The former did not, however, amount to very much.

The product for the four years from 1892 to 1895, inclusive, is not known, even as an estimate, but would not be surprising if it reached \$20,000,000. The year 1896 followed the discovery marked the high point of production. The product in 1896 is doubtfully estimated at \$20,000,000.

Production of gold and silver in Oregon and Washington from 1896 to 1897, inclusive:

| Year—     | Gold and silver— | Year—      | Gold and silver— |
|-----------|------------------|------------|------------------|
| 1896..... | \$ 8,000,000     | 1897.....  | \$ 2,000,000     |
| 1897..... | 2,000,000        | 1898.....  | 1,750,000        |
| 1898..... | 1,750,000        | 1899.....  | 1,500,000        |
| 1899..... | 1,500,000        | 1900.....  | 1,250,000        |
| 1900..... | 1,250,000        | 1901.....  | 1,000,000        |
| 1901..... | 1,000,000        | Total..... | \$25,750,000     |

There are no official statistics for 1896, but the production may be roughly estimated at \$10,000,000. From 1897 to the present time somewhat more accurate statistics are available, which are given below. It should be stated, however, that the silver production does not appear to be reliable, as in many returns from placer mines the relatively small amount of silver is apparently overlooked.

Production of gold and silver in Oregon from 1897 to the present time:

As an estimate. It would not be surprising if it reached \$50,000,000 as the years closely following the discovery marked the high point of production. The product in 1865 is doubtfully estimated at \$30,000,000.

Production of gold and silver in Oregon and Washington from 1856 to 1875, inclusive:

less alloyed with silver, is of almost universal occurrence. The fineness varies from 500 to 900. The quantity amenable to plate amalgamation varies from a few ounces to 100 pounds. The elements are those usually accompanying gold, viz., pyrite, arsenopyrite, zinc blende, galena and chalcopyrite, the two latter rarely in large amounts. Arsenopyrite is very