

erties, the company bought most of the ore produced in the district by individuals and companies other than the Primos Mining Company.

Both companies sack and ship, without milling, ores carrying 30 per cent or more of tungsten trioxide. Such ore can be profitably smelted without further concentration. There is said to be less loss in smelting ores of such a grade than there is in milling the ores and smelting the concentrates. It is probable that the saving in the mills is under 80 per cent of the tungsten contained in the ore. During 1909 the canvas plant of the Primos Mining Company's mill at Cardinal was considerably enlarged, with an increased saving of slimes. Besides other improvements in its mill, the Wolf Tongue Company put in a settling tank through which the overflow from the slimers passes. This device effected an important saving.

Eugene Stevens was in charge of tungsten mining upon the Rogers tract during the year, and an output was made from a number of openings. Farther down Boulder Creek several tungsten properties were operated. Much of the ferberite in the ores from the mines in the northeastern part of the district is in extremely small particles distributed through dark quartz or "hornstone," as it is locally known, and is very difficult to save in milling.

Lessees took out some ore from the Tungsten Mining, Milling and Exploration Company's property between Nederland and Beaver Creek, but the company itself did no work during the year.

Some work was also done on the property of the Tungsten Mines Company.

Over the line in Gilpin County, about 2 miles east of Rollinsville, W. T. Howell, F. H. Berger, and E. M. Greene took out a small quantity of ferberite.

During 1909 only a small quantity of ore was taken from the Colorado Tungsten Corporation's property, which lies a short distance northeast of Nederland.

In the Sugar Loaf district, lying farther northeast of Nederland, only a small quantity of ore was mined.

The total output of tungsten ore from Boulder County during 1909, reduced to a basis of 60 per cent tungsten trioxide, was 993 tons of 2,000 pounds, valued at \$391,160. The preliminary figures given by the Survey at the beginning of the year were much larger, owing to an error in the returns received from one company. Boulder County produced 584 short tons in 1908 and 1,146 short tons in 1907.

*Idaho.*—A few tons of hand-picked scheelite were mined in Idaho from the United Golden Chest mine at Murray, Shoshone County.

*Montana.*—A hübnerite deposit, specimens from which greatly resembled the material from the Birdie mine at Butte, was discovered near Daniels, Mont., but prospecting did not seem to afford encouragement for further work. A deposit of wolframite was reported from Goodrich Gulch, near Twin Bridges, but examined specimens of the supposed tungsten ore were specular hematite.

*Nevada.*—The hübnerite deposits 12 miles south of Osceola, Nev., which have been held for years by J. H. Marriott and the Tungsten Mining and Milling Company, were sold in the fall of 1909 to Oscar A. Turner, who organized the Hübnerite-Tungsten Company. About 30 men were employed in prospecting and development work during the remainder of the year and a large amount of work was done. A mill was planned so that the ore could be concentrated at the



mine. This is especially necessary, as there is a 45-mile haul to Ely, the nearest railroad point.

At Round Mountain the hübnerite deposits of the Round Mountain Monster Mining Company became the property of the Shoshone Tungsten Mining Company. Little was done beyond the annual assessment work.

At Browns, a station upon the Southern Pacific railroad, near the southern boundary of Humboldt County, the Atolia Mining Company of San Francisco did further prospecting work on a scheelite deposit upon which it began work in 1907. A carload of ore was shipped to San Francisco for testing early in 1909.

*Washington.*—A few tons of hand-picked hübnerite were shipped from the Deer Park Mining Company's mine, known as the Tungsten King. The mine is located 10 miles north of Deer Park, Stevens County, Wash. The hübnerite occurs in quartz veins cutting metamorphosed shales, and is accompanied by smoky quartz, cosalite (a bismuth-lead sulphide which carries silver at this place), pyrite in cubical crystals, and gold.

The Germania Mining Company's mine, the Germania, located in the Springdale mining district near Deer Trail, Stevens County, was closed from the fall of 1907 to August, 1909, on account of litigation. At the latter time work was begun again and about 50 men were employed in development work. A mill with crusher, rolls, and tables was erected and the company began milling ore in December. The ore was to be shipped to Hamburg, Germany.

*Other States.*—Although tungsten deposits are known in the Black Hills of South Dakota and in New Mexico, no production was reported in 1909 from either of these States.

### PRODUCTION.

Owing to errors in several returns of tungsten ore produced during the year 1909, the preliminary figures published in January, 1910, were too high. The figures as corrected by later returns indicate a production of 1,619 tons of 60 per cent ore, valued at \$614,370. The production of tungsten ores in the United States from 1900 to 1909, inclusive, has been as follows:

*Production of concentrated tungsten ores in the United States, 1900-1909, in short tons.\**

Years.	Quantity.	Value.	Years.	Quantity.	Value.
1900.....	46	\$11,040	1905.....	803	\$208,676
1901.....	179	27,720	1906.....	928	348,867
1902.....	184	34,040	1907.....	1,640	800,048
1903.....	292	43,639	1908.....	671	220,955
1904.....	740	184,000	1909.....	1,619	614,370

\* The production of tungsten ores in this country from year to year can be fairly compared in this table only since and beginning with 1906, as before that date no effort had been made to reduce the ores to a common basis of concentration. Since 1906 the ores have been, as far as possible, reduced to an equivalent of ore carrying 60 per cent tungsten trioxide ( $WO_3$ ), which is the ordinary commercial basis in the United States.

### PRICES.

The price of tungsten ores ranged from \$5 to \$9 per unit, depending upon quantity, quality, and the immediate need of the buyer. The average price was between \$6 and \$6.50 per unit.