

This company not only treats the black tin for others, but they likewise purchase the stream tin from the miners, giving them value for it according to assay. It may be well to mention here that the company assays all the ore brought to their works, and likewise makes from time to time assays of the tailings to ascertain if much ore is lost.

The ore from battery, and likewise the stream tin, is put into a reverberatory refining-furnace and smelted. This furnace is oblong in shape, being about 18ft. long and 10ft. wide in the widest part, which is in the centre. The inside floor of the furnace has a slight dip towards the centre and likewise towards one side, in order to draw off the ore when melted and sufficiently roasted to free it from impurities. There is a long furnace or fire-box at one end in which firewood is used, having a bridge of about 14in. high dividing it from the furnace where the ore is put. The top of the reverberatory furnace is kept as low as possible in order that the flames coming over the bridge from the fire-box may pass directly over the surface of the ore. There is a flue leading from one side of the furnace on the opposite end to the fire-box, into a large brick chimney, and on the end of the furnace opposite the fire-box there is an opening where the ore is puddled and the slack skimmed off before the melted ore is taken out of the furnace. The furnaces are all bound by strong iron bars, and they are constructed so that the crown on the end next the fire-box is much higher than on the opposite end, so as to allow plenty of room for firewood to be used as fuel. The great object is to get a large fire and to keep the flames as close down on the surface of the ore as possible. At intervals during the time that the roasting of the ore is going on small quantities of charcoal are thrown into the furnace over the surface of the melted ore, so as to keep up a high temperature.

After the ore is drawn off from this furnace it undergoes another process of refining by melting it in large cast-iron pots or basins. The tin bars from the smelting-furnace are put into these basins or pots, and the melted ore is kept in a boiling condition for some time; when the tin is melted pieces of green saplings are stuck in among the hot metal, which emit gas or steam, thereby causing the tin to keep always in a bubbling state. When the tin is considered to be sufficiently pure it is taken out of the pots with ladles and run into ingots fit for the market.

SILVER MINING.

Emmaville.

A silver lode was recently discovered in this district at Little Plan Creek, about nine miles from the township. A company termed the Webb Silver Mining Company has taken up a lease of 240 acres, being 84 chains along the lode, and commenced to work it. The lode runs in a northerly and southerly direction, and has an inclination or dip towards the west. The rock on each side of the lode is a metamorphic clay slate, having a brown appearance with yellow or chrome-coloured veins running through it. The lode is from 2ft. to 4ft. thick, but it has a peculiarity which I have not observed in any other silver lode in New South Wales, in having no well-defined foot- or hanging-walls: the ore and rock seem to merge into each other. There is very little work done on this lode yet, the deepest shaft being only about 22ft. On the south end of the lode there is a good deal of galena ore mixed with blue carbonate of copper, but the shaft at the north end shows a different sample of ore, and in some places I observed chloride of silver. None of the ore has been tested except by assay, but it is anticipated that a great portion of it will average from 130oz. to 200oz. per ton. At the time of my visit about 8 or 10 tons of ore were about to be forwarded to Boorook Silver Works to be tested; these works are about ninety miles distant.

Boorook Silver Works.—These silver-reducing works belong to Messrs. Hall Brothers (who are largely interested in the famous Mount Morgan Mine, in Queensland, near Rockhampton), and are situated about thirty miles to the eastward of Tenterfield, near the Queensland border. They are managed by Mr. Thomas G. Davey, a gentleman who has had eight years' experience in the silver mines and reducing works in Spain. These works are said to be the most complete in New South Wales for treating refractory ores. It may be mentioned that, previous to Mr. Davey taking charge of them, they were an utter failure; the quantity of silver left in the tailings after treatment was far greater than that originally extracted from the ore; however, the amount now obtained is nearly equal to that got in making assays.

Mr. Davey not only understands the manipulation of the various descriptions of silver ore, but he likewise has a knowledge of chemistry, assaying, and metallurgy; and he makes assays of all ore previous to treatment as well as of the tailings after treatment; and if by chance there is a sufficient percentage of silver left in the tailings they are taken from the pits and treated a second time, but this scarcely ever happens unless it is by the carelessness of the workman. The first process when the ore arrives at the works is to put it through the pulverizer or stone-breaker, which reduces it to the size of small road-metal. It is then taken to the stamping-battery, crushed dry, and discharged through gratings having from 100 to 140 holes to the square inch. This crushed material is taken to a floor, mixed with a small quantity of common salt, and then placed in a reverberatory furnace and calcined in order to free the ore from all sulphur and arsenic. When sufficiently roasted it is drawn out and allowed to cool; afterwards it is taken and put through a revolving screen, which has 2,500 holes to the square inch. The dust that comes through this screen is afterwards amalgamated with quicksilver in four of Wheeler's pans and one berdan basin.

Mr. Davey kindly furnished me with a description of the works and the nature of the silver ore in this locality, which is as follows: The silver here occurs in a variety of forms and combinations—viz., in argentiferous iron, copper pyrites, blende in abundance, a little galena, flexible and brittle sulphurets of silver, and at present a little chloro-bromide of silver. Therefore, it will be seen that the ore is most refractory, requiring great care and attention in its treatment in the various processes it has to undergo in order to insure satisfactory results. The ore as it comes from the mine is tipped over a strong iron screen to separate the fine from the coarse stuff. The coarse material is then hand-sorted and stacked into heaps—i.e., best ore, seconds (which have to be crushed and con-