

crushed in the ordinary manner with stamps, and the gold collected on riffle tables; but on sinking deeper on the lode it was found to contain a large percentage of silver, which could not be collected by the ordinary process adopted for saving the gold. The former owners of this mine sold it to a company in Sydney. Before taking any steps to erect works to treat the ore, they further prospected the ground to ascertain the extent of the lode. On sinking, the amount of gold in the quartz got less, while the percentage of silver and galena gradually increased. This led to a new process being adopted, by which the gold, silver, lead, and copper are extracted and made marketable.

The lode on the surface is composed of burnt-looking quartz mixed with gossan, resembling the appearance of the stone where gold is obtained in the Mount Morgan Mine in Queensland; but, on sinking on the lode the quartz changed in character, and got mixed more with silver, galena, and gossan, presenting a dark-brown appearance. After sinking on the lode for a considerable distance, a tunnel was driven from the face of the hill, so that it would be about 300ft. below the surface when it got under the crown, and from this tunnel cross-cuts were made to cut the lode at short intervals, so that it might be accurately tested by assay.

The method adopted for getting an average sample for assay is to take from each truck or barrow load of ore samples, which are mixed together, and an assay made from them. This system is likewise adopted in taking out the ore from various parts of the mine, each truck supplying its quota of the sample heap, from which assays are afterwards made. An assayer is employed on the works testing the value of the ore, and likewise the slag that comes from the smelting furnace as well as the dust that accumulates in the flues, to see that the different minerals are all extracted.

On each side of the lode there is brown metamorphic slate, having yellow veins through it, and on the hanging-wall there is about 2ft. of soft pipeclay.

It was found after starting the tunnel that the lode, although presenting the same appearance and character, apparently running in a slight inclination from the vertical under foot, that the upper portion had at some time been turned over, lying almost flat, presenting a perfect quarry, in many places 50ft. in thickness. On the upper portion of this flat lode the ore contains a large percentage of silver, galena, argentiferous iron pyrites, and gossan; but, towards the bottom or foot-wall, it is mixed to a considerable extent with carbonate of copper, and is not so rich in silver. Everywhere throughout the lode is mixed with large quantities of gossan. In some places there are caves or cavities in the lode, with iron stalactites and stalagmites, presenting a beautiful and picturesque appearance. The manager of this mine, Mr. Hurley, who has had many years' experience in the silver mines of Nevada, states that he has never seen any lodes before of this particular character, and although he has been over two years in charge of this mine in opening it up, the appearances of the ore in many instances deceived him. What he supposed to be poor ore in some instances proved on assay to be rich, and what he sometimes took for good ore turned out to be poor.

The opening of this mine has been conducted in an intelligent manner, and with care not to involve the shareholders in a great expenditure without first ascertaining the reasonable prospects of the mine paying. On this point I will quote Mr. Hurley's words: "It is the business of every mine manager to have the mine he is connected with thoroughly prospected, and assays carefully made to ascertain that the quantity of ore to be obtained is carrying such a percentage of minerals as will amply reimburse the shareholders for any money that may be expended in erecting plant."

The plant of this company consists of two smelting-furnaces, together with refining-furnaces, pulverizers, and all necessary machinery to work the same.

The smelting-furnaces consist of one known as the "Pacific" and the other as the "Probert," the latter being a new patent by Messrs. La Monte and Kahlo, of Sydney. These two furnaces are constructed with water-jackets. The principal difference between them is that the Pacific has an enclosed water-jacket, and is made in two segments; while the Probert has an open water-jacket, and is made in several segments, so that in the event of one segment being damaged it can easily be taken out and replaced with another without much loss of time. This furnace is likewise considerably larger than the Pacific, and consequently smelts more ore.

The Pacific furnace is made of steel plates about one quarter of an inch in thickness, in two segments, with an enclosed water-jacket all round it, the space between the inside and outside plates being about 4in. Each segment is closely riveted together and made thoroughly watertight. The water-jacket portion of it stands about 5ft. high, and is of an oval shape, being about 4ft. diameter in one direction and 3ft. in the other. At one side, and at the bottom of the furnace, there is an opening through which to draw out the slag as it melts. There are also openings in the water-jacket, for the tuyeres to pass through into the furnace, for the blast. The furnace is set on a foundation built of fire-brick, which is bound round with strong iron bands, and in the centre of this brickwork there is a well built in the shape of an inverted cone, capable of holding from 30cwt. to 2 tons of lead and melted metal; and from the bottom of this well there is an opening built to allow the melted lead and other metals to rise in a small well which is left on the top at one side of the foundation and outside the blast-furnace, in order that the height of lead and metal may be seen as it rises in the inside well during the time the furnace is at work, and likewise to enable the metal to be lifted with ladles into moulds, and prevent it rising above the top of the inside well. The foundation is considerably larger than the furnace, so as to allow room for cast-iron columns to stand to carry the upper portion of the furnace, which is built of fire-brick. The water-jacket portion of the furnace is set over the top of the well, which is built in the centre of the foundation and on top of the water-jacket; the furnace is built up with fire-bricks in the same manner as a cupola for melting cast iron; but, instead of the chimney going straight up, there is an iron hood over the top of the furnace, made with an elbow at an acute angle, on which is fitted a wrought-iron pipe, about 2ft. in diameter, to convey the smoke and fumes down to the chambers near the bottom of the chimney, which is about 50ft. distant from the smelting-furnace. In this pipe there are recesses left with down-casts for the fumes to deposit after they are condensed, and doors fixed so that anything deposited can be withdrawn.