

The amalgamators consist of four of Wheeler's pans, each of which holds about 7cwt. of ore per charge. Each pan is first filled with about 4in. of water; then the ore is put in by ordinary buckets while the muller is in motion (which makes about sixty revolutions per minute), until the whole of the 7cwt. has been charged, and as soon as it becomes a moderately thick slime, or rather a pulp from 150lb. to 200lb. of mercury, according to the quantity of the silver per ton, is added, and in two hours 10lb. more mercury is filtered through a small calico bag into the pan, so as to cause a perfect dissemination of mercury throughout the mass. In four hours after charging the amalgamation of all the silver contained in the ore should be complete. Care has to be taken to keep the pulp at a proper consistency, as the successful result depends on this. If too thin the mercury remains at the bottom of the pan and will not circulate through the mass, and if too thick there is a danger of flouring the mercury, thus causing a heavy loss. The mass is kept at a temperature of about 130° Fahr. by the introduction of a jet of steam at intervals. As all the ore is charged in a state of fine dust no grinding in the pans is required, thus avoiding the expense of wear and tear of dies, shoes, and mullers.

At the end of four hours the pans are filled with water and allowed to run in this state for about fifteen minutes, during which the pulp is reduced to a very fine liquid slime, and the mercury, carrying with it the silver, sinks to the bottom of the pan. The pans are then stopped, and the slime discharged through the upper hole, which is 6in. from the bottom, into a shoot or conduit which leads to an iron vat 6ft. in diameter by 5ft. in height, called the "separator." Here the slime is further thinned by an addition of water, and kept continually in motion by means of rakes attached to four arms, which are driven by a vertical shaft connected with the main driving gear, making 25 revolutions per minute; any mercury or amalgam that may have escaped from the pans is thus collected at the bottom. After keeping this separator in motion for about three hours the slime is discharged into tailing-pits or into the river, according to circumstances. It may be well to add here that, during the time the separator is at work, samples of the slime are taken out and assayed to ascertain how much (if any) has not been amalgamated.

The pans are again charged as before, except only from 10lb. to 20lb. of mercury is added (through a calico bag), and another 10lb. about two hours afterwards.

When the amalgam commences to cling to the sides, mullers, &c., in thick layers, the pans should be cleaned out by running off the mercury and taking out the amalgam. The mercury is discharged through the bottom hole of the pan into a small iron vat or separator, 3ft. in diameter and 3ft. in height, which is furnished with a vertical shaft and arms on the same principle as the large separators. The sides of the pan are then cleaned, as also the shoes, dies, and muller, by means of small scrapers. And the amalgam thus obtained is allowed to run for a few minutes in a berdan, together with a quantity of mercury, and in a short time the hard amalgam will be ground up and mixed with the other mercury. Any slime or scales of iron are washed out of the pans, which are again ready for another charge. The amalgam has now become thin, and it is taken out of the berdan by means of a ladle, and any skimmings, consisting of an amalgam of mercury and base metals, such as zinc, iron, lead, &c., are afterwards retorted to save the mercury and any silver it may contain. The skimmings are carefully removed, until the surface of the mercury is left quite bright. The mercury is now poured into a strong canvas bag or filter, when the free mercury passes through the pores into an iron basin below, leaving the hard amalgam in the filter-bag. When the bag is full of amalgam it is carefully beaten with a wooden roller until no more mercury is seen to pass through the pores of the canvas. The bag is now emptied of its contents into a convenient vessel for weighing, and eventually taken to the retort.

The mercury in the small vat is drawn off by a tap into the canvas bag and filtered, as before described. All slime from the bottom of the separator is passed through the berdan in order to save any amalgam or mercury it may contain.

The amalgam is then retorted in the ordinary way, and when all the mercury is passed over to the condenser, the retort is allowed to cool. The silver in a porous state is taken out, broken in pieces of a convenient size, melted in a plumbago crucible, and run into ingots weighing about 50lb. each. The bullion from this company's mine varies from 0·850 to 0·900 fine, and contains about 1 per cent. of gold.

The seconds from the sorting of the ore at the mine are concentrated in ordinary German hand-jiggers, and the resulting ore, averaging about 90oz. of silver and 18dwt. of gold per ton, is then treated in the manner before described. This mode of concentration, although primitive and slow, is very effective, all the silver being saved. One man at a jigger can produce about 5cwt. of good ore per diem of eight hours.

The present depth of the mine that this company is working is 300ft. For the first 75ft. the silver was found as chloride, and chloro-bromide; below that depth to 140ft. argentiferous iron pyrites, and blende with spots of silver glance; under this level to the present depth the silver is principally found as flexible sulphide of silver. The lode varies in thickness considerably; in places it is not more than 2ft., while in other parts it is 19ft. thick; but generally when the lode is thickest the stone becomes poorer, in which case only the best part of the lode is taken out.

For the first 200ft. the formation on each side of the silver lode is a brown metamorphic slate highly impregnated with iron pyrites; below that to a further depth of 30ft., common greenstone feldspar and hornblende; beneath this, again, metamorphic slate occurs to a further depth of 50ft., when it changes to a syenite formation. The lode has always been found richest in the metamorphic slate, and generally poorest where the syenite occurs.

Sunny Corner.

The Sunny Corner Company's mine is situated at Sunny Corner (a small township that has sprung up within the last two years owing to silver mines being discovered in the locality), about twenty-five miles south of Bathurst, and contains one of the largest mineral lodes that I have seen in New South Wales. Some years ago it was worked on the outcrop for gold, the stone being