

lead are driven off. Necessarily some of the gold and silver is volatilized, and care must be used to prevent too high a heat, which increases the loss by volatilization.

When the ore reaches the finishing hearth, the heat is gradually raised to drive off the remaining sulphur, and salt is added to decompose the sulphates which have formed in the furnace and chloridize the silver. The quantity of salt added depends upon the amount of silver and copper present in the ore, and the time of adding the salt also depends upon the character of the ore. Some ores require 30 per cent. or 35 per cent. salt, while some only require  $\frac{1}{2}$  of one per cent. Then again some ores require the salt to be added six or eight hours before drawing the charge, and to others the salt is added a half hour before drawing.

There is such a difference in the character of Sulphuret ores, that it requires considerable experience to work them properly.

The Sulphurets remain on the finishing hearth about eight hours, when they are withdrawn from the furnace through a hole in the hearth into a vault, where they are allowed to remain as long as possible, as the chlorine gas evolved from the decomposition of the salt combines more readily with the silver when at rest.

The roasted sulphurets are shovelled out of the vault on to a brick cooling floor and spread out to cool. After they are cooled they are sprinkled with sufficient water to prevent them from flying away in dust, and aid the next process. The ore is now screened to get rid of any lumps, and shovelled loosely into vats about five feet deep and four feet in diameter, fitted with close covers. In the bottom of this vat, called the gassing vat, is placed a false bottom, raised about two inches above the real bottom, and bored full of holes. On this false bottom is put a layer of burlap, reaching up the sides of the vat a short distance. This burlap serves to filter the liquid and to prevent the ore from getting down below the false bottom. The vats are slightly inclined to allow the liquor to completely drain off, for which purpose a wooden spigot is put into the side of the vat just even with the bottom.

After the ore is put into the gassing tank chlorine gas is introduced in the bottom of the vat below the false-bottom, and is allowed to desseminate through the ore. When the gas has nearly reached the top of the ore in the vat, the cover is put on and luted with flour-dough to prevent the escape of the gas. The gas is allowed to remain in contact with the ore from thirty-six to forty-eight hours, thereby effecting the chloridizing of the gold.

After the chlorine-gas has been in contact with the ore a sufficient length of time, water is introduced through the cover of the vat, percolating through the ore and dissolving the chloride of gold.

The solution is drawn off from the vat through the spigot by means of a rubber hose or wooden box, into a vat about 7 $\frac{1}{2}$  feet in diameter and 3 feet high. The influx of the water is in proportion to the influx of the solution. The ore is covered with water during the process of "leaching" as it is called.

The gold is precipitated by Sulphate of Iron, made by dissolving iron in dilute sulphuric acid.

After all the gold has been leached out of the ore, the ore is shovelled into other vats, the same size as the gassing vats, and also fitted with false bottoms and filters. A solution of Hyposulphite of Soda is then introduced into the ore, which dissolves the chloride of silver. This solution is then introduced into vats 9 feet in diameter and 3 feet high and the silver precipitated by Polysulphide of Lime or Soda, made by dissolving a mixture of sulphur and lime or sulphur and caustic soda in water. The supernatant liquid is drawn off and run into a well from which it is pumped into a reservoir to be used over again.

The supernatant liquid from the gold vats is drawn off into other vats, and the copper precipitated on iron by heating the liquid with steam. There is always some gold left in suspension after precipitating with sulphate of iron, which is carried down with the copper upon precipitation.

After the copper has settled the supernatant liquid is drawn off and runs to waste. After the silver has been leached out of the ore, the ore is shovelled out of the tanks and run out of the way.

The chlorine gas is generated in lead generators from a mixture of salt, black oxide of manganese, sulphuric acid and water, and is conducted into the gassing-vats through lead pipes. It takes about eight days to get the precious metals out of the ore, from the time it enters the furnace till the residuum is run off as tailings. It is impossible to extract all the gold and silver. If the tailings assay no higher than six dollars per ton, the result is very satisfactory. Experience shows that the richer the sulphurets the closer they can be worked.

It is well to "clean up" the gold and silver precipitating tank once in ten days or two weeks and melt the gold and silver into bars.

Usually the gold is very fine, sometimes running as high as 998 or 999. The silver is not so fine being usually in combination with copper and lead.

**COAL.**—It is reported that the Ontario Coal Mine, Cape Breton, has been purchased by the Company owning the Coxheath Copper Mine for the price of \$80,000.

Mr. R. G. Leckie has offered the Joggins Coal Mining Company the sum of \$200,000 for their property. He also offers \$140,000 for the railway from Maccan to the Joggins Mines. At a meeting of the shareholders of the Joggins Co. in St. John, Mr. Leckie's proposition was favorably entertained by a majority of the shareholders. Mr. Leckie is also negotiating to purchase other coal properties near the Joggins Mines, amongst others the Prospect Mine for \$40,000.

The Cape Breton Advocate understands that Thomas Routledge, late assistant Superintendent of the Sydney and Louisburg Coal Company, has leased the Clyde Mine, Big Glace Bay, and will proceed to ship immediately. Several New York parties are associated with him in the enterprise.

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For further particulars, address

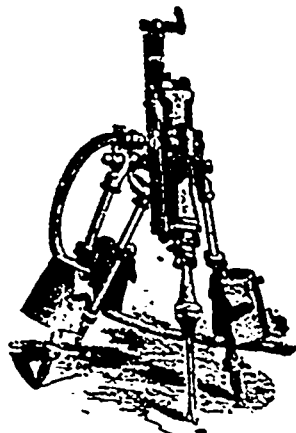
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