reducing the sulphides to a lower stage of sulphurisation. This sulphur burns in the furnace to SO_2, and, coming in contact with material undergoing oxidation, is converted into sulphuric anhydride, SO_3. The antimony and arsenic are also being volatilised during this period. If the concentrates themselves contain oxides of copper magnesia of lime, salt has to be added while roasting to chloridize the material, which would otherwise absorb the chlorine whilst being gassed. When salt has to be added it is usual to do this just before the roasting is finished. The quantity of gold-chloride mixed with the chlorine gas evolved from the red-hot ore when salt is added is large; but these gases have to pass over a long length of comparatively cold, unsalted, unoxidized ore, so the SO_2 from the colder ore, combined with the steam from the fuel, very soon reduce the gold-chloride in the furnace. The loss in bulk caused by roasting varies with the concentrates in different districts. Here it is about 29 to 30 per cent. In other words, 1 ton green sulphurets is represented by about 1,570 lb. of the roasted material. When roasted this material is spread out on the cooling-floor and damped until it binds in the hand when compressed. It is then screened into vats ready for gassing, about 5 tons green being gassed at once. To generate sufficient gas the chemicals required are 90 lb. sulphuric acid, 90 lb. water, 50 manganese-dioxide, and 60 lb. salt. This, of course, varies according to the material treated. The gas remains in contact with the roasted material thirty-six hours, after which water is applied, and the gold-chloride is subsequently drawn off into a settling-tank, thence to the precipitating-tank, where it is first violently agitated to liberate any superfluous gas, then the gold is precipitated by the addition of ferrous-sulphate solution in excess, stirred again, and allowed to settle. After standing forty-eight hours the clear liquid is decanted, passed through filters, and discarded. The brown precipitate of gold remaining in the vat is collected when in sufficient quantity, dried, and then run down with fluxes into the bar, the gold being exceptionally pure—991 fineness; value, £4 4s. per ounce.

"*Canvas Plant.*—An addition to the gold-saving appliances is now being erected, called a 'canvas plant'; one-half is completed and working, the other half nearly so. The object of this arrangement is to arrest the fine particles of sulphurets which do not settle on the Frue vanners, being in very minute form (slime). Thus the pulp as it leaves the mill is classified, the coarse sands being put aside, whilst the slime flows on over a series of canvas tables, on which the fine sulphurets remain. The particles of lighter specific gravity flow away to waste, being practically valueless. The canvas tables are periodically washed down; the sulphurets accruing therefrom are dried down and then pass through the chlorination-works. Value of plant, £600.

"Some idea of the general arrangement of the plant may be gathered from the following: The pulp as it leaves the vanners is led away in launders to one or, preferably, a series of spitzkaste, in which the whole of the coarse sands are separated from the slime, the latter flowing on, the sands themselves being either stored or rejected according to their value. The secret of the successful working of the tables depends largely upon the classification of the pulp, for a little sand going over the spitzkaste will very soon foul the tables. When the slime in suspension reaches the canvas plant it is easily segregated into twelve parts, and flows along a small launder with ½ in. fall to the foot. Each of these twelve small launders feeds a separate table, 12 ft. by 12 ft., divided into four strips, each 3 ft. in width, on which the canvas is spread, having a fall of 1¼ in. to the foot. This grade depends largely upon the classification of the pulp, and is so arranged that the slime of lighter specific gravity flows away whilst the heavier particles remain on the canvas. Between each table, 12 ft. by 12 ft., there is a drop of 6 in. This enables the supply-launder, also the residue-launder, to take ½ in. fall to the foot, so that the whole of the worthless material at the bottom of each table finds its way into the same launder. At the top of each table there is a board so shaped that the material it receives is evenly spread out over the whole 12 ft., so that there is an even stream flowing over each table. After the tables have been running a certain time the man in charge proceeds to wash down: First he cuts off the supply of slime from one table; this supply now flows on to an auxiliary table kept for the purpose. He then opens a water-valve, and the table is purified from any worthless material. The water is now stopped; a shutter at the bottom of the table is turned over; by so doing anything now coming from the table finds its way into another launder, down which the valuable material has to go, as it is liberated from the canvas by a spray of water under great pressure. This process only requires a few minutes, when the pulp again proceeds to flow over this table, and the operator washes another; the valuable pulp runs on down to a sump, from which it is pumped by a centrifugal up into a large tank beside the chlorination-works. The tank is so divided that one compartment or another can receive the pulp until it is full, when it is thrown out on to a draining-floor, after which it is thoroughly dried on the chlorination furnace, and then passes through in the same manner as the concentrates from the vanners. The centrifugal pump is driven by a small Pelton wheel from the main pressure-pipe. The worthless material flowing away operates on an automatic sampler, so a check is kept upon the discarded slime and a record obtained. The pulp from twenty stamps flows over twelve tables, 12 ft. by 12 ft., on one side of the building, and the other twenty stamps taking the other side of the same building. The whole process is on the some principal as the old Cornish frames, but modified and improved to suit the quartz pulp.

"*General.*—The tonnage per stamp per day is about 2·5 tons with the forty-stamp mill, and 1·5 tons with the twenty-stamp mill. The capacity of the new mill will very shortly be considerably increased. The forty-stamp mill has run about 305 days, and the twenty-stamp mill about 265, since March, 1898, crushing together 37,500 tons, yielding 15,563 oz. 10 dwt. 17 gr. of bullion, to the value of £63,593 3s. 7d. This amount was extracted by amalgamation only. From the new mill 391 tons of concentrates have been made, the majority of which have already passed through the chlorination furnace. The cost of chlorination has had scarcely time enough yet to adjust itself, and has cost about £2 15s. I think this will be reduced to about £2 10s. per green ton treated in the near future. The freight, duty, and the original cost of some of the chemicals, situated, as we are, makes the cost of treatment high. The value of the bullion from amalgamation is about £4 3s. per ounce; from chlorination, £4 4s. per ounce.