

The following table will show the average results of these companies in the several districts since the companies were formed.

Name of District.				Amount of Capital paid up.	Dividends paid.	Loss on Working.	Profit on Working.
				£	£	£	£
Auckland	...	...	...	29,234	328,014	...	298,780
Reefton	...	...	...	184,672	242,867	...	58,195
Mokihinui	...	...	...	10,823	2,400	8,423	...
Westland	...	...	...	36,222	7,960	28,262	...
Otago	...	...	...	52,035	34,156	17,879	...
Totals	...	...	...	312,986	615,397	...	302,411

This shows that there has been a profit on the working of the mining companies at Auckland and Reefton of £356,975, and a loss in the Mokihinui, Westland, and Otago Districts of £54,564; but, to take the whole of the colony, the profit has been £302,411. This, however, does not show the whole of the mining companies, as a large number of them did not publish a statement of their affairs, as required by Act.

CASSEL'S CHLORINATION PROCESS.

This is a process whereby auriferous ores can be successfully worked by a cheap method. It was patented about two years ago by Henry Renner Cassel, of London. A working model is now on exhibition at Mr. Hayes's shop, Lambton Quay. From what I have seen of the process it seems specially adapted for auriferous ores, but the patentees would require to introduce a full-sized machine before much can be said respecting it. The principle, however, seems to be correct, and deserves a fair and impartial trial.

The invention proposes to treat metalliferous ores, especially auriferous compounds, by electrolysis, in a machine where chlorine and oxygen are generated, where the metals are dissolved at the positive pole, thence deposited at the negative pole.

The most powerful solvent which can be produced on a large scale for gold and most other metals is chlorine, and this can be easily generated by electrolysis of a solution of common salt. The chlorine and oxygen are set free at the anode, and if this pole be of metal it will be readily dissolved, and the dissolved metal will be carried over to be deposited at the cathode; but, if the anode be composed of carbon, any particle of metal coming in contact with the same during electrolysis will also be readily dissolved.

Gold ores containing antimony, sulphur, arsenic, tellurium, bismuth, and many other compounds are termed "refractory ores," commonly designated "pyrites." Their treatment offers great difficulty, and hitherto it has always been necessary to roast or calcine them in order to oxidize the sulphur, arsenic, antimony, &c., and so set the gold free. This becomes unnecessary in this process, as the nascent chlorine and oxygen are the means of oxidizing the pyrites, and setting the gold free, which is then converted into chloride of gold. The gold is deposited at the cathode in the form of black slime.

Mr. Cassel gives the following description of his machine:—

"Fig. 1 is a side elevation of the machine, complete.

"Fig. 2 is an end view.

"Fig. 3 is a transverse section.

"Fig. 4 is a section through the shaft, showing the holes and internal screw.

"*a* is a drum, made of wood or other suitable material, and, if it be of metal, must be thoroughly insulated inside. This drum contains a number of carbon rods or plates as anodes; indeed, the inside thereof may be completely lined with carbon or plumbago, and he prefers to arrange the carbons inside the drum horizontally, as indicated by *b*, in Fig. 3; and, to prevent a leakage at the protruding ends, rubber-solution, marine glue, or other compound, may be used. The ends of the carbon are rendered metallic either by depositing suitable metal thereon, or by wires, soldering, or otherwise. These carbons are connected with each other by a band or rod of metal, *c*, Figs. 1 and 2, which is soldered or screwed to the protruding ends of the carbons, *b*. One or more rows of carbons may be introduced into the drum, and these must then be suitably connected. The drum may be of any desired dimensions, and, if large, the carbons may be introduced into both ends. The drum is mounted on a hollow shaft, *d*, of copper, iron, or other suitable material. In that portion of the shaft within the drum a number of holes are bored, *e*, of any desirable size (Fig. 4), due regard being given to the strength of the shaft. After well insulating the outer surface of the shaft, asbestos-cloth is fastened around it to cover the holes, and, if desired, also all those parts outside the shaft exposed to the solution in the drum. It is desirable to make the asbestos adhere to the shaft by means of rubber-solution, marine glue, or otherwise. Instead of using asbestos-cloth, slag-wool, or both, may be used, or any other suitable material, through which the current passes, but which prevents any of the crushed ore from doing so. The drum is fixed on the shaft in any suitable manner, and to prevent leakage rubber or other washers may be used. The ends of the asbestos are fastened under the flanges against the sides of the drum, or they may be fastened on the shaft by means of hard-rubber rings, or otherwise. The ends of the hollow shaft pass through stuffing-boxes, *f*, in metal standards or tanks, *g*. On the drum is fixed a cog-wheel, *h*, with which gears a pinion, *i*, and driven by a pulley, *k*. Inside the shaft is arranged an archimedean screw, *l*,