

MINERAL RESOURCES OF NEW ZEALAND.*

The exploitation of a mineral deposit is a commercial undertaking carried on with a view to profit. Its promoters contemplate the expenditure of a sum of money in the expectation of gaining a larger sum by the sale of the mineral won and put into marketable condition by their operations. It is not a work of scientific research; and, although its operations may result in the enrichment of the world at large by the incidental acquisition of much valuable and previously unsuspected knowledge, it is essentially a business proposition.

Thus the development of the mineral resources of this country must proceed along commercial lines or not at all. The location of as-yet-undiscovered deposits is not the only point worthy of consideration, although it necessarily bulks largely in an essay on the present subject; for, while the people of New Zealand can do but little to increase the value in the markets of the world of the minerals contained in their country, yet members of all classes can assist in the direction of decreasing production-costs.

Considering the matter from a purely utilitarian standpoint, the most important item for the shareholder is dividend. This may be defined as that amount—expressed as a percentage of share capital—which is returned to shareholders. Evidently, then, if the share capital of the company could be kept at a lower figure, the same sum as net profits would appear as a higher dividend, and would thus encourage investors to extend or repeat such profitable undertakings. Again, with share capital and gross profits unaltered, a higher dividend could be secured by decreasing operating expenses.

Some of the most important items that figure on the debit side of the profit and loss account are legal and similar expenses, depreciation of plant, cost of power, materials and stores expended, loss of metal in residues and otherwise, cost of conveyance of product to market, wages, rent, taxes, etc.

Now, it may be quite possible to diminish the total while increasing the last two items.

The employee wishes to maintain a high standard of comfort, which demands high wages, considerable purchasing-power of same, continuity of employment, and health. The public at large desire to receive a fair proportion of the profits in return for supplying the raw material which renders the operations possible. But, at the same time, the State has important duties to discharge, not the least of which are to keep religiously the national honour, and to prevent as far as possible individual ignorance or mental shortsightedness from injuring any of her citizens.

Thus it is quite legitimate and even essential for the essayist to deal with as many of the points touched upon above as his space will allow.

Many of the following suggestions have been made previously. They have invariably been dismissed as impracticable. The writer has therefore usually given figures in support of his contentions, and where this was impossible has debated the point at considerable length.

The essay will be divided into three parts, dealing respectively with the minerals contained in—**I. Lodes:** Value of output to end of 1905, £18,000,000; **II. Stratified deposits:** Value of output to end of 1905 £12,000,000; **III. Drifts:** Value of output to end of 1905, £62,000,000.

PART I.—LODES.

Copper.

It would be difficult to specify a district in New Zealand in which cupriferous minerals have not been located, yet the production of ores of this metal has up to date been trifling. Small quantities of copper-ore have been taken at various times from the following:

(1.) Champion Mine, Waimea County, and adjoining leases, Roding River, Nelson: On these properties there is a heavy lode of copper-pyrites and some copper has been

found native. A reduction-works was erected, but the capital of the company was soon exhausted, and the mine closed down. A company (Maoriland Copper-mining Company) has recently been formed in Christchurch to exploit leases in this district.

(2.) Johnstone's United Mine, Aniseed Valley, Nelson: copper lode in serpentine rock. No work proceeding.

(3.) Dun Mountain, Nelson: Various ores of copper in serpentine. Not now worked.

(4.) D'Urville Island, Nelson: Various ores of copper in serpentine. Not now worked.

(5.) Kawau Island, Auckland: Copper-pyrites. Not now worked.

(6.) Great Barrier Island: Fissure lode of copper-pyrites in slate has produced over 2,000 tons, but it is not now worked.

(7.) Croixelles Harbour: Small quantity taken out. Not now worked.

Other places at which cupriferous minerals have been detected are: Waitahuna, Tuapeka County, Otago (lode 4 ft. thick); Moke Creek, Lake County, Otago; Routeburn, Lake County, Otago; Flagpole Hill, Selwyn County, Otago; Ismuth Sound, Preservation Inlet, Otago (auriferous); George Sound, Milford Sound, Dusky Sound, Otago; Jackson's Bay; Paringa River, Westland; Arahura Gorge, Westland (olivine and schist, bearing copper up to 10 per cent.).

Hackett's stratum, Aniseed Valley, Nelson (serpentine carrying native copper 5 per cent., evenly disseminated): Windtrap Gully, Maitai, Nelson; Bedstead Gully, Aorere, Nelson; Maharahara, Woodville, Hawke's Bay (chalcocite, etc., auriferous); Patua Range, Taranaki; Te Aroha, Auckland (in auriferous quartz); Hen and Chickens, Whangarei, Auckland (deposit of cupriferous diorite of great thickness but variable richness).

There are also many other deposits which have been prospected in a rough and ready fashion, but little is known of the real merits of any of them.

Value of a Copper-Deposit.

A report to a capitalist who may be contemplating the exploitation of a cupriferous lode must answer the following questions:

(1.) What percentage of copper is carried in the ore? Is the mineral auriferous or argentiferous, if only to a slight degree?

(2.) What is the probable extent of the deposit, and does it present any unusual difficulties as regards mining operations?

(3.) Taking into consideration the following factors: (a) Quantity and price of fuel available; (b) quantity of fuel required per ton of ore; (c) quantity of suitable fluxes in neighbourhood; (d) price of labour and cost of power; (e) cost of machinery and plant delivered on claims; (f) quantity and value of gold and silver concentrates or ores which can be purchased locally at a profit—is treatment on the ground commercially possible?

(4.) If shipping for treatment elsewhere is inevitable, what will be the cost of delivering the ore or concentrates at the smelting-works?

In the case of unusual ore-value being shown, it might pay the operator or the State to spend considerable sums on constructive works in order that the last two questions might be met. Thus, as the country becomes opened up by roads and railways, its copper-deposits will gradually increase in value until their exploitation—or, at least, their systematic investigation—becomes commercially practicable. The demand for copper is increasing more rapidly than the supply, and its price is rising in accordance therewith.

The location, valuation, and exploitation of the copper deposits of the colony will be considered with those of auriferous lodes in subsequent pages.

The value of copper-ore produced to date is £18,228.

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