

TABLE SHOWING FINENESS AND VALUE OF BULLION EXTRACTED FROM ORES.

No.	Name.	Fineness.		Value per Ounce.
		Gold.	Silver.	
1	Ocean View, Matarangi	·4500	·3795	£ s. d. 1 17 0
2	Corbett, Marototo	·0540	·9290	0 7 0
3	McNeill, Matarangi	·6350	·3300	2 11 9
4	Kapai, Kuaotunu	·6354	·2250	2 11 6
5	McLiver, Puriri	·6360	·3431	2 11 9
6	Koputauaki	·0652	·8934	0 7 5
7	"	·0650	·8938	0 7 4
8	Ashton, Wakamarino	·2674	·7112	1 99
9	Sanderson, Great Barrier	·0062	·9201	0 2 9
10	Williams, Russell	·0388	·8844	0 4 10
11	Wolff, Wakamarino	·2173	·7262	0 19 2
12	Sanderson, Okupu Bay, Great Barrier Island	·0022	·9726	0 2 4
13	James, "Success," Coromandel	·4700	·5196	1 18 7
13A	" " (specimens)	·7132	·2856	2 17 7

The ores from Matarangi, Kuaotunu, and Puriri were free from metallic sulphides, and well suited for treatment by the Cassel process, especially in conjunction with dry-crushing.

The ore from Marototo, forwarded by Mr. Corbett, contains a large proportion of its bullion in the form of a telluride of silver, which is not an amalgamable ore, hence the low extraction.

The parcels of ore from Koputauaki Bay, near Coromandel, forwarded by Mr. Montgomery Davis, contained a large proportion of iron- and copper-pyrites, zinc-blende, galena, and some grains of tetrahedrite, with which the silver seemed to be associated. The low extraction from these valuable ores show that they cannot be successfully treated by amalgamation.

The Wakamarino ores contained a small percentage of scheelite, which did not seem to injuriously affect the results by pan-amalgamation.

SYLLABUS OF LECTURES AND INSTRUCTION FOR 1893-94.

Practical Assaying.—(Lecturer and Instructor, the Director, assisted by Mr. F. B. Allen, M.A., B.Sc.)

Dry Assaying.—(1.) The furnaces and appliances used in fire-assaying, with sketches. (2.) The fluxes, their properties and uses. (3.) The reducers and their reducing-powers. (4.) Fuels and other reagents, as salt, iron, sheet and granulated lead, glass-powder, &c. (5.) Preparation of pure silver for parting Au and Ag. (6.) Preparation of nitric-acid solutions for parting. (7.) Preliminary assays of ores and bullion—their use and application. (8.) Volatility of gold and silver; the influence of different temperatures in different parts of the muffle, and of time in the muffle. (9.) The operations in fire-assaying—*a*, powdering the ore; *b*, sampling the dry pulp; *c*, preparing the charge; *d*, fusing the charge and extracting the lead button; *e*, cupelling the lead button; *f*, weighing the bullion; *g*, parting and calculating the value of the bullion. (10.) Probable sources of error in fire-assaying. (11.) Keeping note-books and proper records of results. (12.) The assay of litharge and red-lead. (13.) The assay of gold and silver and their ores—*a*, in clean quartz; *b*, in pyritous quartz; *c*, in concentrates and tailings; *d*, in roasted ores; *e*, by amalgamation assay; *f*, by scorification assay. (14.) The retorting and melting of bullion. (15.) The refining of base bullion. (16.) The assay of bullion—*a*, weighing the assay; *b*, cupelling for base; *c*, adding pure silver for parting; *d*, rolling the cornet; *e*, parting the cornet; *f*, calculating the value. (17.) The calculation of results obtained in batteries from treatment of gold- and silver-ores. (18.) The assay of galena and cerussite—the valuation of lead, gold, and silver. (19.) The valuation of lead-bullion. (20.) The assay of tin-ore (cassiterite).

Wet Assaying.—(21.) Operations—*a*, solution; *b*, crystallization; *c*, precipitation; *d*, filtration; *e*, decantation; *f*, washing; *g*, evaporation; *h*, distillation; *i*, ignition; *j*, sublimation; *k*, fusion; *l*, use of blowpipe; *m*, the use of spirit- and gas-lamps; *n*, the preparation of reagents, and tests of purity, &c.; *o*, the preparation of fluxes; *p*, test-papers; *q*, the balance, weights, operations of weighing; *r*, preservation of platinum crucibles. (22.) The assay of iron-ores—*a*, gravimetric; *b*, volumetric. (23.) The assay of copper-ores—*a*, as oxide; *b*, as metal by electrolysis; *c*, volumetric; *d*, colorimetric. (24.) The assay of antimonite. (25.) The assay of bismuth glance. (26.) The assay of cinnabar. (27.) The assay of galena. (28.) The assay of zinc-ores. (29.) The assay of manganese-ores. (30.) The assay of nickel-ores. (31.) The assay of cobalt-ores. (32.) The assay of chromite of iron. (33.) The assay of arsenic ores. (34.) The assay of silver-ores—*a*, volumetric; *b*, gravimetric. (35.) The valuation of specimens.

Metallurgy of Gold and Silver.—(Lecturer, the Director.)

(1.) Ore-crushing and -pulverizing machinery—*a*, rock-breakers; *b*, stamps; *c*, mills, rolls, &c. (2.) Metallurgy of gold—*a*, amalgamation on copper plates, in pans, &c.; *b*, chlorination processes and operations; *c*, leaching processes (Cassel's, &c.). (3.) Metallurgy of silver—*a*, smelting and amalgamating ores; *b*, smelting—reduction with lead and fluxes; *c*, amalgamation in pans with mercury—use of chemicals; *d*, leaching with solvents—sea-water or brine, ammonia, sodium hyposulphite, alkaline cyanides; *e*, oxidizing and chloridizing roasting.