

*Mineralogy and Blowpipe Determination.*—(Lecturer and Instructor, the Director.)

*Systematic Mineralogy.*—(1.) Physical properties of minerals, their hardness, S.G., &c. (2.) Optical properties: Refraction, reflection, polarisation, lustre, phosphorescence. (3.) Chemical properties. (4.) The application of the blowpipe, colour-tests, &c. (5.) Isomorphism, pseudomorphism, and allotropy. (6.) Distribution and paragenesis of minerals. (7.) Classification of minerals—chemical, economic.

*Descriptive Mineralogy.*—(1.) Non-metallic division: Carbon group, &c. (2.) Metallic division: A description of the principal ores of the common metals, and their New Zealand localities and modes of occurrence.

*Crystallography.*—(1.) The six systems, their axes, typical forms, modified forms, &c. (2.) Holohedral and hemihedral forms. (3.) Reading of faces.

*Mathematics.*—(Lecturer and Instructor, Mr. W. H. Baker, B.Sc.)

*Arithmetic* (including the simple rules).—Weights and measures (those bearing on mining and assaying), greatest common measure, least common multiple, vulgar fractions, decimal fractions, proportion, problems.

*Algebra* (Hall and Knight's Algebra).—The meaning and use of the various signs and symbols, the simple rules, greatest common measure, least common multiple, fractions, factors, symmetry, problems containing one unknown, simultaneous equations, quadratic equations, simultaneous equations with more than one unknown, problems involving quadratics and the use of several unknowns, practice in the use of formulæ and their transposition.

*Euclid.*—The first four books (Todhunter), including the definitions and axioms.

*Land- and Mine-surveying.*—(Lecturer and Instructor, the Director.)

Adjustments of theodolite, dial, level; chain and steel tapes; traversing with theodolite and dial; connecting survey with standing meridian; ranging lines; division of land; computation of areas by latitudes and departures; reduction of slope measurements; off-sets; chaining, computation of co-ordinates; balancing survey; plotting survey and off-sets; obstacles to alignment.

*Mine-surveying.*—Different methods of connecting underground with surface meridian; magnetic variation; to reduce magnetic meridian to true meridian; conducting underground traverse with theodolite and dial; correcting magnetic survey by method of back- and fore-sights; holing.

*Mathematics.*—Equations; logarithms; plane trigonometry; solutions of triangles; calculation of last or connecting line; of distance from working-face to nearest point on boundary of lease.

*Levelling.*—Recording levels; practice with level and staff; grading roads, tramways, and water-races; plotting and striking grades; calculation of contents of earthworks by prismoidal formula; grading with Abney or reflecting level.

*Mining, Applied Mechanics, and Hydraulics.*—(Lecturer, the Director.)

*Mining.*—Shafts: Selection of site, size; modes of excavation, in dry and wet rock, wet sand, and swamp; timbering of shafts; ladders; chambers—size, excavation timbering; levels and drives—size, excavation, timbering; securing sets on inclines; modes of stoping, height and timbering of stopes; main passes—size, timbering, division; mullock-passes—size, timbering, distance apart.

*Pumping and Pit-work.*—Pumps and engines used in metal-mining, force-pumps, plunger-pump, draw-lift, fixing pump-pieces, bearers, friction-rollers, V-bobs, balance-bobs, main rods, flat rods, clacks, buckets, bucket-rod, catches, staples and glands; thickness of pipes; capacity of pumps.

*Ventilation.*—Atmospheric pressure, vapour density; ventilation of drives and underground workings by natural and artificial means; furnaces, water-blasts, fans; division of air-courses; noxious gases met with in metal- and coal-mines, their composition and detection.

*Explosives.*—Their use in quarries and mines, relative strengths, action, gases evolved, composition; charging boreholes; firing explosives; quantity to be used.

*Hauling and Winding.*—Safety-cages; man-engines; strength of ropes; strength of timbers.

*Water-power.*—Turbines, Pelton wheels, calculation of horse-power and flow of water from boxes and nozzles.

Text-book used: Gordon's "Mining and Engineering," 10s., Government Printer.

*Practical Assaying.*—(Lecturers and Instructors, the Director and Assistant.)

*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 gold and silver. (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 muffle; also of time in 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 record of results. (12.) The assay of litharge and red-lead. (13.) The assay of gold- and silver-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";