

*Descriptive Mineralogy.*—Description of the chief varieties ; mode of occurrence ; distribution in New Zealand ; value.

*Blowpipe Determination.*—Use of the blowpipe ; oxidizing and reducing flames ; examination of mineral samples.

*Text-book.*—Text-book of Mineralogy, Dana.

#### *Mathematics.*

*Arithmetic.*—The simple rules ; weights and measures ; vulgar fractions ; decimals ; proportion ; problems ; logarithms ; mensuration.

*Algebra.*—The signs and symbols ; simple rules ; factors ; symmetry ; problems ; quadratic equations ; simultaneous equations ; binomial theorem ; use of mining formulæ.

*Trigonometry.*—Definition of an angle ; trigonometrical ratios ; easy problems ; solution of triangles.

*Geometry.*—Junior—Part I of Hall and Stevens's Geometry. Senior—Parts I, II, and III of Hall and Stevens's Geometry, or their equivalents in Workman's Tutorial Geometry.

*Text-books.*—Arithmetic, Brook Smith ; Elementary Algebra, Hall and Knight ; Trigonometry, Lock ; Geometry, Hall and Stevens, or Workman.

#### *Drawing.*

*Geometrical Drawing.*—Use of scales and instruments ; plane geometrical figures ; projection ; isometric drawing.

*Mechanical Drawing.*—Machine-drawing to scale from copies, from rough sketches with dimensions, and from the machines, showing plan, elevation, and sections ; shading ; inking-in ; figuring and lettering ; preparation of working-drawings and tracings on paper and on cloth.

#### *Practical Astronomy.*

The ecliptic ; equinoxes ; meridians ; longitude ; latitude ; altitude ; declination ; right ascension ; azimuth ; use of Nautical Almanac ; polar distance ; zenith distance ; hour-angle ; sidereal-time ; mean time ; solar time ; parallax ; refraction ; retardation ; acceleration ; convergency of meridian ; determination of meridian by star-and-sun observations, by single altitudes and greatest elongation of circumpolar stars ; use of star-charts ; calculation of hour-angle, azimuth, and altitude of celestial bodies for any time and place ; determination of latitude by meridian altitudes ; determination of time by star-transits and sun observations.

*Text-books.*—Navigation and Nautical Astronomy, Young ; Practical Astronomy, Loomis.

*Reference-books.*—Nautical Almanac ; The Southern Skies, Proctor.

#### *Petrology.*

Preparations of thin rock-sections ; use of the polariscope ; identification of minerals in thin sections ; drawing and photographing of sections. Theory of light ; ordinary and extraordinary ray ; polarised light ; positive and negative crystals ; uniaxial and biaxial crystals ; interference figures, &c.

A grinding-plate and polarising microscope are provided by the school.

*Text-books.*—Petrology for Students, Harker ; Text-book of Mineralogy, Dana.

*Reference-books.*—Tables for the Determination of the Rock-forming Minerals, Lœwinson-Lessing ; Microscopical Physiography of Rock-forming Minerals, Rosenbusch-Iddings.

#### *Physics.*

*Heat.*—Change of volume, measures of temperature ; change of state, latent heat, hygrometry, specific heat, calorimetry ; sources of heat, the conservation and dissipation of energy ; convection, conduction ; reflection, refraction, transmission, and absorption of radiant energy. Use of thermometer, barometer, hygrometer ; determination of the density of solids and liquids ; calculation of the density of gases from observations of their temperature and pressure ; calorimetry.

*Sound.*—The production and propagation of sound ; the vibration of sounding bodies ; the elements of the physical theory of music.

*Light.*—Nature, production, and propagation of light ; the laws of reflection and refraction at plane and spherical surfaces ; prismatic dispersion and spectra ; interference, double refraction, and plane polarisation ; the principal optical instruments and vision. Use of goniometer, photometer, spectroscope, telescope, and microscope ; determination of the curvature, focal length, and magnifying power of lenses ; determination of the refractive index of solids and liquids.

*Static Electricity.*—Fundamental phenomena of attraction and repulsion, conduction, induction, and distribution, electrostatic units ; electrical machines ; condensers.

*Magnetism.*—Fundamental phenomena of magnetic attraction, repulsion, and induction ; magnetic units ; terrestrial magnetism.

*Current Electricity.*—Voltaic batteries ; galvanometers ; electrolysis ; Ohm's law ; thermal effects of the electric current ; electro-magnetic units ; the interaction of magnets and currents, and the mutual action of currents upon one another ; thermo electricity ; induction of currents ; magneto-electric and dynamo-electric machines. Use of electrometer, galvanometer, voltmeter, Wheatstone's bridge, and resistance coils ; determination of the resistance of conductors and batteries ; determination of the electro-motive force of batteries, and of the strength of currents ; measurement of magnetic forces.

*Text-book.*—The Tutorial Physics, Stewart and Catchpool.

*Reference-book.*—Natural Philosophy, Deschanel.