f, calculating the value. (17.) The calculation of results obtained in batteries from treatment of gold- and siver-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).

Text-book : Park's " Laboratory Instructions in Assaying and Practical Chemistry," 7s. 6d.

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.

Text-book : Park's " Assaying and Practical Chemistry," 7s. 6d.

Practical Chemistry.—(Lecturer and Instructor, Mr. W. H. Baker, B.Sc.)

Junior Class.—(1.) Operations (these are the same as for wet assaying). (2.) The separation of the metals into groups. (3.) Qualitative tests for the different metals. (4.) The separation of silver, lead, mercury. (5.) The separation of copper, bismuth, arsenic, and antimony. (6.) The separation of iron and alumina, iron and zinc, iron and manganese, iron and chromium. (7.) The separation of calcium and magnesium. (8.) The separation of barium, strontium, and calcium. (9.) The separation of potassium and sodium. (10.) Qualitative tests for the acid-radicals (inorganic)—*a*, H_2S, HCl, HBr, HI ; *b*, HNO_3, $HClO_3$; *c*, HBO_2, H_2CO_3, H_2CrO_4, HF, H_3PO_4, H_4SiO_4, H_2SO_4, H_3AsO_4.

(Lecturer and Instructor, the Director.)

Senior Class.—(1.) The estimation of chlorine. (2.) The estimation of sulphuric acid and sulphur. (3.) The estimation of phosphoric acid. (4.) The analysis of limestones and calcareous freestone. (5.) The analysis of coals, coke, charcoal, and shales. (6.) The analysis of barytes. (7.) The analysis of fluor-spar. (8.) The analysis of scheelite and wolfram. (9.) The analysis of rocks (including estimation of K_2O and Na_2O). (10.) The analysis of fireclays. (11.) The analysis of soils. (12.) The analysis of complex sulphide ores. (13.) The analysis of milk. (14.) The analysis of waters. (15.) The analysis of bone-dust and bone-ash, with estimation of nitrogen. (16.) The analysis of guanos and apatite. (17.) The analysis of superphosphates. (18.) The estimation of alcohol—*a*, by weight ; *b*, by volume. (19.) Volumetric analysis : The estimation of— alkaline hydrates ; alkaline carbonates ; acids, HCl, H_2SO_4, HNO_3, $HC_2H_3O_2$, $H_2C_4H_4O_6$; haloid salts, HCN, KCN, I, As_2O_3, SO_2 ($Na_2S_2O_3 + 5H_2O$).

Text-book : Park's " Laboratory Instructions in Assaying and Practical Chemistry," 7s. 6d.

Theoretical Chemistry.—(Lecturer, Mr. W. H. Baker, B.Sc.)

Principles of Chemistry and Chemical Philosophy.—Atoms, molecules, vapour-density, quantivalence, chemical formulæ.

The Elements.—(1.) Their history, occurrence, preparation, properties, uses. (2.) Compounds of the elements, their history, preparation, properties, uses, &c.

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

(1.) Ore-crushing and pulverising 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 (Cassels', &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.

Text-books : Eissler's " Metallurgy of Gold and Silver." Gordon's " Mining and Engineering."

Physics.—(Lecturer, the Director.)

Fundamental ideas of matter and energy ; conditions of matter ; gravitation ; mechanical powers ; sound ; light ; heat ; magnetism ; electricity ; chemistry ; physiology and health.

Practical Astronomy.—(Lecturer and Instructor, the Director.)

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.

Mechanical Drawing.—(Instructor, Mr. E. J. Williams.)

Use of scales ; printing and lettering ; outline drawing ; shading ; colouring ; drawing to scale from copies and objects, portions of machinery, and woodwork, showing plans, elevation, and sections.