lite, and their accuracy was tested by circuit traverse or minor triangulation. Topographical plans were also furnished, as well as a plan and sections showing the reef, stopes, and underground workings of some well-known mine.

During the present year I have instructed the advanced students in setting out the opposite angles of roads, obstacles to chaining and alignment, division of land, &c. The practical use of a knowledge of surveying is now freely admitted by all our leading mine-managers.

Mining.—The instruction in this subject covers all the course of instruction required by candidates for Government mine-managers' certificates, excepting surveying. It includes mining, geology, mineralogy, dynamics, and classification of lodes; construction and timbering of shafts, chambers, drives, &c.; construction of dams; explosives, ventilation, pumping and pit-work, hauling and winding, strengths of materials, hydraulics, and applied mechanics. Special attention is given to the recovery of lost lodes, and to hydraulics. A knowledge of these is indispensible to every well-informed mine-manager and mining engineer.

Diploma of Mining Engineer.—This diploma is open only to students of the School of Mines who have gained by examination a first-class certificate as a mine-manager after a two years' course of instruction, and who shall thereafter pass a satisfactory examination in the following subjects after a further period of one year's study at the school:—

(*a.*) Engineering Surveying.—(1.) Levelling with level, theodolite, reflecting-level and barometer; the level-book; grading; sections, &c. (2.) Road and railway curves. (3.) Tunnelling, setting out and excavating. (4.) Contents of earthwork, estimates, &c. (5.) Preparation of plans and specifications.

(*b.*) Designing and Constructing.—(1.) Designing and preparing estimates of flumes, trestles, bridges, culverts, aqueducts, poppet-legs, battery sites and foundations, &c. (2.) Preparing working-plans and tracings of same.

(*c.*) Land- and Mine-surveying.—(1.) Compass surveying. (2.) Theodolite surveying. (3.) Obstacles to angular surveying and alignment. (4.) Mapping surveys and calculating areas. (5.) Road surveys and setting off road-angles. (6.) Division of land. (7.) Topographical surveys and plans.

(*d.*) Geodetic Surveying.—(1.) Triangulation, major and minor. (2.) Astronomical problems and definitions. (3.) Fixing the true meridian. (4.) The determination of latitude. (5.) The determination of time.

(*e.*) Applied Mechanics.—(1.) Strength of materials. (2.) Strains on materials. (3.) Horse-power of engines for batteries, &c.

(*f.*) Hydraulics.—(1.) Flow of water from orifices. (2.) Horse-power of water-motors, &c.

(*g.*) Mechanical Drawing.

(*h.*) General and Mining Geology.

(*i.*) Mineralogy.

(*j.*) Mathematics.

(*k.*) Electricity and Magnetism.

Laboratory.—The number of assays and analyses performed for the public during the past year amounted to 206, most of which were determinations for gold and silver. This shows a great falling-of compared with the returns of last year, a result mainly due to the prevailing depression and the assays performed by private assayers. The investigation of one poison case was undertaken by myself, as well as a number of alcohol determinations for the Police Department.

Experimental Plant.—The machinery and appliances are all in good working-order, and several much-needed improvements have been effected during the year. The cyanide plant recently erected in the school battery is most complete, and substantial in construction. It consists of an agitator on an elevated platform, and below this a circular percolating vat 3ft. 3in. deep and 5ft. 3in. in diameter. The percolator is fitted with a lattice filter-frame, and connected directly with the zinc-extractor, and also with a large steel vacuum-cylinder, which is in its turn connected with the zinc-extractor. The cylinder is exhausted by a fine single-action air-pump, which is surrounded by a cold-water jacket. Below the level of the floor there are two large circular sumphs to receive the spent solutions. The sumphs are protected by a close-timbered platform. On an elevated platform situated over the sumphs there is a Douglas solution-pump, connected with both sumphs and with the percolator and agitator. The whole of the cocks and numerous pipe-connections are disposed so as to facilitate the treatment of ores either by agitation or percolation. The agitator and air-pump are actuated by pulleys on secondary shafts connected by pulleys with the main shaft. All the vats, machinery, and appliances were constructed and erected by Messrs. Price Brothers, of the Thames, upon whom the work reflects the greatest credit. Several parcels of ore are already awaiting treatment by this plant, and numerous inquiries have already been received from many parts of the peninsula and from the South Island.

The number of parcels of ore treated by the Washoe process last year was thirteen, compared with twenty-one for 1892–93. As in former years, all the operations in connection with the treatment, from the drying of the ore to the final melting and valuation of the bullion, were performed by the school students without any outside aid. The method of treatment and the results are shown in the following tabulated statement. It will be seen that, although fewer parcels of ore were treated than in 1892, the total weight of ore put through was almost the same, the exact figures being—for 1893–94, 21,610lb., equal to 9·65 tons; and for 1892–93, 22,819lb., equal to 10·2 tons. Omitting the ores forwarded by Mr. Montgomery Davis from Kopukauaki Bay, which were smelting-ores, the average percentage of recovery amounted to 77·9 per cent., as compared with 78·3 per cent. for the preceding year. The sterling value of the bullion extracted from the parcels of ore treated during the year was about £275, and for the previous year about £1,000.