

COURSE IN ELECTRICAL ENGINEERING.

The New Zealand University, on the recommendation of the English Examiners in Mining Engineering, sitting in conference in London at the end of 1906, has very wisely added electricity to the course for the B.E. degree; and it will now be necessary for the Otago School of Mines to make provision for the new requirement. The applications of electricity to mining and metallurgy are many and daily increasing, and in all up-to-date mining schools instruction in practical electricity forms an integral part of the regular course. This will necessitate a revision of the existing mining and metallurgical associate courses, which have now been in use without amendment for eight years. Experience has shown that improvements can be effected in several directions, and steps will be taken at an early date to prepare the amended courses for incorporation in the Calendar for 1910.

Applied electricity cannot be taught without electrical machines and apparatus, and until these are procured our mining students will be required to take the course in electrical engineering given at the Dunedin Technical School, where a good course of instruction is taught by Mr. E. F. Stark, D.Sc.E.E., M.Am.Inst.E.E.

Satisfactory arrangements with this end in view have already been made with Mr. A. Marshall, B.A., Director of the Technical School.

TANNA HILL GEODETIC STATION.

This station was linked up by triangulation with the Government Geodetic Initial Station A, at Taieri West, the latitude and longitude being reduced in terms of the Carrington spheroid. Bearings, taken in terms of Taieri West meridian, cleared of convergence, were checked by observations to α Hydri, β Trianguli (Aust.), and σ Octantis, the results showing a difference of only $3''$ of arc as between the computed and observed bearings.

The following data is recorded for the information of surveyors and engineers:—

Tanna Hill, latitude $45^{\circ} 52' 11.3''$ S.; longitude $170^{\circ} 32' 19.0''$ E.

Convergence of meridian, Tanna Hill to Taieri W. initial, $10' 1''$ E.

Bearing Tanna Hill to Flagstaff, $314^{\circ} 49' 57''$.

Bearing Tanna Hill to Signal Hill, $63^{\circ} 10' 30''$.

Bearing Tanna Hill to axis of clock in Town Hall Tower, Octagon, $225^{\circ} 46' 57''$.

(All bearings are given in terms of Taieri West initial.)

With the object of facilitating the computation of differences of latitude and longitude and the reversed geodetic azimuth between trigonometrical stations, the author has computed the value, in links, of a second of arc of latitude and longitude for every degree and half-degree of latitude from the equator to 60° latitude. The values are set out in terms of a spheroid with a compression of 1 in 294, and are contained in a table on one page of the author's "Text-book on Theodolite Surveying and Levelling" in both the English and American editions. At the present time, differences of latitude and longitude and reversed azimuths are computed in India by the Everest spheroid; in Great Britain by the Clarke spheroid of 1858; and in the United States of America by the Clarke spheroid of 1866, involving in each case the use of long and elaborate tables of constants. The author's table gives results that for minor and major triangles do not differ more than a fraction of a second with those obtained by the use of the longer P Q R tables involving the application of three or four constant factors; and effects a considerable saving of time, besides diminishing the tendency to err in computation.

LABORATORY.

During the past year seventy-one samples of ore and mineral substances were assayed for the public by Mr. Waters at schedule rates, and in the same period forty-seven samples of rock, mineral, &c., were examined and reported on by Professor Park, fifty-eight by Professor Marshall and by Mr. Waters, all free of charge.

ACKNOWLEDGMENTS.

In conclusion, the Director of the School of Mines wishes to place on record his appreciation of the zeal and ability with which Professor P. Marshall, Mr. W. B. Waters, and the assistants have carried out the work of their several departments during the year covered by this report.

I have, &c.,

JAMES PARK, Director.

Mr. A. H. V. MORGAN, M.A., Director of the Waihi School of Mines, to the UNDER-SECRETARY, Mines Department, Wellington.

SIR,—

Waihi, 31st March, 1909.

I have the honour to present my report for 1908. The average number of students was sixty-one, and the average class attendance 161. These figures, though slightly lower than the corresponding figures for the previous year, are very satisfactory, and quite up to the average to be expected from a town of the population of Waihi, according to the experience of mining and technical schools in other places. A notable feature during the last three years has been the steady increase in the number of *bona fide* mining students.

Examinations.—At the annual examinations conducted by the Mines Department last December 32 candidates presented themselves for the written papers and 14 for the practical tests. The results are exceedingly satisfactory, 24 first-class, 25 second-class, and 8 third-class certificates being obtained, and only five papers failing to secure certificates. In addition, 15 passes were recorded in the practical