

Crown grants and other Acts, the average cost, £9 4s. 8d. per mile, being, within a few shillings, the same as for the past three years.

Standard Surveys.—Mr. Hallett has laid down bench marks and standard traverses in the Villages of Kaikora, Waipawa, and Waipukurau. The maps of the standard survey of the Town of Napier have been delayed through the ill-health of Mr. Rochfort, and through his unfortunately losing the services of the assistant surveyor engaged with him on the field-work.

Native Land Court Surveys.—Sketch plans of seven claims, covering 80,229 acres, have been drawn from our topographical and record maps, in readiness for the investigations of the Court. Several other surveys are in progress and well advanced towards completion.

OFFICE.

Land Transfer Surveys.—In this branch of the work of the department there has been a steady increase every year for the past five years, with the exception of 1881-82, when the area dealt with fell off to 18,406 acres. During the past year Mr. Dennan has examined and recorded sixty-two plans, covering an area of 55,042 acres. The plans of trig., section, and road surveys, received number eighty-three. The work done for other departments again mounts up to the salary of a draftsman. The plans drawn on certificates of title or grants number 196, covering 20,186 acres. Seven sale plans and a plan of the Mohaka district have been prepared for printing.

Proposed Operations and Work on Hand, 1884-85.—The minor triangulation on hand for survey is 667,440 acres, extending over the open lands which have not yet been triangulated, and over 64,000 acres of bush lands which are being surveyed for settlement. The triangulation standing over from last season in the Maungaharuru and other districts will be carried out in connection with the revision surveys of the Waikare-Mohaka Block. It is proposed to employ Mr. Rich on the triangulation of the Pourere and other districts to the southward, who will at the same time make several road surveys. The other triangulations named in the list are wanted to control Native Land Court and road surveys. The settlement surveys on hand are—Applications and revision surveys, 2,752 acres; educational reserves, 7,000 acres; lands for settlement, 99,563 acres: in all, 109,315 acres. At present four surveyors, Messrs. Hallett, Wilson, Price, and McNicol, are engaged in settlement surveys, and Mr. Tone is daily expected to join Mr. McNicol in the Tautane Reserve. There will be prepared for the market within the next four months 14,000 acres of pastoral land, and by next autumn 30,000 acres of bush-land in the Woodville and Tautane districts. There are 167 miles of roads on hand for survey, which includes nearly all the new lines of roads that are likely to be required in this district. In the Waikare-Mohaka Block alone some eighty miles of roads are wanted to open up the country and give access from one block to another. The Native Land Court surveys on hand amount to 521,928 acres. It is proposed to employ Mr. Hallett on the Waikare-Mohaka Block directly he can be spared from the more pressing settlement surveys. The blocks in the Seventy-Mile Bush that passed the Native Land Court on a sketch-plan some ten years back have never been surveyed, and, as the Government has refused to advance the cost of the surveys, it is quite likely they will remain on hand for some considerable time. I anticipate that 80,000 acres will pass the Native Land Court at an early date and be surveyed, but as to when the remaining 304,928 acres will be surveyed seems very uncertain.

HORACE BAKER, Chief Surveyor.

TARANAKI.

Astronomical.—On the completion of the triangulation from Wellington a remarkable discrepancy became apparent between the geodesical and astronomical latitudes, or, in other words, the latitude deduced from triangulation in terms of Mount Cook, Wellington, and the astronomical value assigned to Marsland Hill by my observations in 1874 with a 7-inch transit theodolite. It amounted to nearly 13", representing about a quarter of a mile on the surface of the earth. In December last I obtained the 12-inch altazimuth belonging to the department and observed at Marsland Hill, New Plymouth. The result of eleven nights' work, during which fifty-four pairs of stars were taken, gave 10" discrepancy, slightly reducing it from what I made ten years previously with the 7-inch theodolite. As New Plymouth is about sixteen miles due north of Mount Egmont I was anxious to see what effect it would have on the plumb-line. I proceeded to Hawera, which is about twenty-three miles distant from the mountain, but not quite due south of it. Here, to my surprise, the discrepancy increased from 10"·03 at Marsland Hill to 19"·94. Further south I went and observed at Patea, expecting to decrease the amount, which I did, but to a very small degree, making 19"·27. Finding that these two stations, which were much further removed from Mount Egmont than Marsland Hill, gave tolerably accordant results, I looked upon them as probably being about the normal for the locality; but on observing at Pukearuhe, forty miles to the north-east of Mount Egmont, I was again met with a surprise by finding the astronomical latitude of that place almost in terms with that at Marsland Hill. The investigation as far as I have at present pursued it reveals this: that the deflection of the plummet is southwards along the northern coast and northward on the southern coast, and that the cause is not to be looked for in Mount Egmont alone, but in the interior of the district generally. I intend pushing this interesting and important investigation further by observing at Midhurst and Pungarehu, both of which places the previous results would point to as being along the central line of the cause of the disturbance. It may be remarked that the density is not seaward, as has so often been observed. The instrument used has proved that it is capable of giving good results, as will be seen from the attached details of the observations. It cannot be expected to compare with a zenith telescope, but it may be reasonably presumed that the final results are but a fraction of a second from the truth. The "probable error" at the different stations works out from 0"·13 to 0"·15.