

APPENDIX.

EXTRACTS FROM THE REPORTS OF CHIEF SURVEYORS IN CHARGE OF SETTLEMENT AND SECTIONAL OPERATIONS IN DISTRICTS.

AUCKLAND.

Major Triangulation.—An area of 412,000 acres has been covered, at the slight cost of about $\frac{1}{4}$ d. per acre. This most useful extension was executed by Mr. L. Cussen and assistant, during last winter and early spring, over the Patetere country, by means of which another close has been obtained between the Mount Eden and Bay of Plenty circuits. The difference on the closing side being as follows:—

Mount Eden circuit side ...	...	39—31=81532·3		
Bay of Plenty circuit side...	...	39—31=81526·4	5·4	
			5·4	10·2
				= 0·53 link per mile.
Mount Eden circuit side ...	39—31=137°	24' 33"		
Bay of Plenty circuit side...	39—31=137°	24' 25"	+ convergence.	
		8"		

The distance between the two bases, as roughly measured through the triangles, is 240 miles. The closure therefore is another satisfactory proof of the dependence which may be placed in the major work. The heights at Station 39 differ by only 4 feet in a distance of 180 miles. This latter result is due, no doubt, to compensating errors; but a former closure between Bay of Plenty and Hawke's Bay major triangulation shows only a difference of 6 feet in a greater distance.

Minor Triangulation.—This work has been, in nearly all cases, derived from the major sides by the Ray trace-system. It covers an area of 496,696 acres, executed at a cost of 1·2d. per acre, being slightly less than the mean of last year, which is owing to the country covered being more open, though a large proportion has been in difficult bush country. A list of closures is furnished herewith, which will show that the work is well within the limits allowed, though in one case, from some unexplained cause, it approaches it very nearly.*

Topographical and Trigonometrical Survey.—Under this head an area of 503,759 acres has been completed, at a cost of 6ld. per acre. It is found invariably to be the case in this district that this class of work is less costly than simple triangulation, the reason being that the topographical work can only be carried on (under ordinary circumstances) in the open country. The general return shows that the two last areas in this column have cost very much more than any of the others per acre, and this is due to the country being entirely forest-clad. The 282,000 acres completed by Mr. Cussen, at the slight cost of $\frac{1}{4}$ d. per acre, is in very easy open country, and was done at the same time as the major work already referred to. In the extension of this work a closure was effected between the circuits of Bay of Plenty and Poverty Bay, with a result which, considering the circumstances, may be deemed fairly good; though probably a better will be obtained when the work is extended to eliminate a triangle in which an angle of 151° enters as a component of the closing triangle. The closure is as follows:—

Bay of Plenty circuit side ...	...	=45733·5		
Poverty Bay circuit side ...	...	=45748·4	14·9	
			14·9	5·7 miles.
Bay of Plenty circuit side ...	...	=113°	46' 30"	
Poverty Bay circuit side ...	...	=113°	44' 41"	+ convergence.
			1' 49"	

The distance between the bases is 130 miles. Great hardships were endured by the surveyor who did this work in the mountainous Urewera country, which is entirely forest-clad. The topographical plans of this work (excepting Mr. Cussen's) are hardly up to the standard I should like to see. This is the more to be regretted, as it is the class of work which, besides its practical use to the selector, is most likely to bring credit to the surveyor from the geographical world at large.

* See page 23,