

SESS. II.—1887.
NEW ZEALAND.

SURVEYS OF NEW ZEALAND.

(REPORT FOR 1886-87.)

Presented to both Houses of the General Assembly by Command of His Excellency.

SIR,—

General Survey Office, Wellington, 30th August, 1887.

I have the honour to submit the annual report of the operations of the Survey Department for the twelve months ended the 30th June, 1887.

The work is very similar in character from year to year, which admits of its being arranged under the same headings and tables, thereby affording an easy means of comparison between the out-turn of the several years.

The general summary of the field-work for the twelve months under report is as follows :—

	Area.	Rate per Acre.			Cost.		
		£	s.	d.	£	s.	d.
Major triangulation	1,177,771 acres	0	0	0.44	2,184	14	11
Minor triangulation	696,366 "	0	0	0.81	2,366	19	3
Topographical and trigonometrical survey	1,512,589 "	0	0	1.02	6,470	14	9
Rural and suburban	279,737 "	0	2	1	29,130	1	4
" for associations	63,853 "	0	2	0.5	...	...	...
Town-section survey	{ 2,547 $\frac{1}{4}$ " (997 lots) }	1	5	4 (p. lot)	1,263	3	1
Native Land Court survey	68,465 acres	0	0	4.6	1,313	16	10
" " at cost of Maori owners	145,583 "	...	...	...	...	...	...
Native Land Purchase survey	274,845 "	0	0	0.67	746	8	5
" " at cost of Native Dept.	416,235 "	...	...	...	...	...	...
Mining surveys	6,509 "	0	5	11.5	1,941	3	10
Roads and railways	358 $\frac{1}{2}$ miles	14	4	4	5,136	14	8
Miscellaneous surveys ... ..	...	...	...	...	7,401	9	5
					<u>£57,955</u>	<u>6</u>	<u>6</u>

The total expenditure on the field- and office-work was £94,404 16s. 10d., of which a sum of £25,298 16s. 9d. was refunded for services rendered to other departments of Government, and for fees recovered for mining and other surveys, leaving £69,106 chargeable against Crown lands surveys. In no former year has the expenditure been so small. It is less by £9,505 on that of last year, and less by £35,175 a year on the annual average of the previous nine years.

The decrease in expenditure is not due to any change of system, but to the fact that the triangulation and other standard works are now so well advanced that operations in these classes of survey have been much curtailed of late. In the actual settlement surveys, however, there has been no curtailment, for both the areas and number of sections surveyed last year are considerably in excess of the two preceding years. There is still a considerable legacy of old land claims imperfectly surveyed, which require revision before the grants can be issued, and there are road-rights to be exercised before the right lapses. But, notwithstanding those arrears, in future the main strength of the survey staff can be devoted to the settlement surveys.

TRIANGULATION.

The principal triangulations were of the interior of the North Island, on the borders of the Auckland and Wellington Provincial Districts, covering the south portion of the King-country and the Waimarino Block. The surveyors employed were Mr. L. Cussen in the

King-country, and Messrs. A. D. Wilson, John Annabell, J. R. Annabell, and J. A. Thorpe in the Waimarino. In the Middle Island Mr. F. S. Smith and Mr. F. A. Thompson completed about two hundred square miles of triangulation and topography on the high back-run country of the Amuri. Mr. W. D. B. Murray connected by a Ray-trace triangulation the scattered surveys in the districts along the coast-line from Wangamoa to the French Pass. In Westland the triangulation, which for several years past has been gradually extending southward from Hokitika, is now completed, the whole of the intervening coast districts to Martin's Bay being now trigonometrically and topographically surveyed. This is a great work excellently performed, directed throughout by Mr. Mueller, and executed under great hardships and privation by Mr. G. J. Roberts and Mr. W. G. Murray.

SETTLEMENT SURVEYS ON RURAL AND SUBURBAN LANDS.

This class of survey comprehends the selection of the district and occupation road-lines, and the marking-off on the ground of the farms or sections for settlement. The areas of lands so treated aggregate to a total of 343,590 acres, subdivided into 3,704 sections, at an average cost of 2s. 1d. an acre. This is 3d. per acre higher than last year. The extra cost is due mainly to the average size of sections being less than ever before, on account of the number of sections under fifty acres each laid off for village settlements. As the settlement surveys are now almost entirely in bush and hilly districts, the tendency will necessarily be towards a greater cost per acre, for many of the road-lines have to be graded, and in bush sections back-corner pegs are now put in. On a less careful and complete system the surveys might be executed at a less initial cost, but the few pence per acre saved would be a sorry compensation for badly-selected road-lines and vaguely-marked boundaries.

NATIVE SURVEYS.

For the purpose of investigation of title and of individualisation of same, 167 blocks or sections, comprising 68,465 acres, were surveyed by the staff, and 160,526 acres, in 159 blocks, by authorised surveyors; and there is in the Awarua and other adjacent blocks in the Upper Rangitikei about 300,000 acres now under survey.

In Native Land Purchase surveys the Taupo-nui-atia blocks on the west side of Lake Taupo and the Waimarino Block, in all nearly 800,000 acres, were under survey by staff and authorised surveyors, and there is an area of about 80,000 acres now in progress of survey in the Takapau and Mangatoro Districts, Hawke's Bay.

LAND TRANSFER SURVEYS.

This class of survey is concerned entirely with freehold lands, its object being to afford correct plans and descriptions of the subdivisions and other dealings with private estates. Every survey is carefully examined and checked in the office and occasionally in the field, to clear up discrepancies, which frequently exist from imperfect original surveys, from obliteration of boundaries, or from encroachment, before the plan is passed on to the District Land Registrar for issue of guaranteed title.

GOLD-MINING AND ROAD SURVEYS, ETC.

The mining surveys are for the quartz-mining applications, special claims, coal and other mineral areas, which are held on lease; 208 applications, covering 6,509 acres, were dealt with.

The road surveys were principally in the exercise of the right to make road reserves through Native blocks before the expiry of fifteen years from the date of the grant from the Crown. The right lapses after that. It would have been in the public interest had the period been longer within which to exercise the right of taking land for roads; for, as it is, in many blocks the time has run out before there is any actual need for defining the road, so far as use is concerned. From this cause and pressure of other work the time has been allowed to lapse without the right being exercised in some cases, where, as the country gets settled, the omission may cause the inconvenience and expense of taking roads under the Public Works Act. On the other hand it is quite likely that some of the roads which have been laid off in anticipation of the country's requirements, so as to come within the limit of the statutory time, may be found not to be so well placed as they would have been could the surveys have been postponed until it was seen how the country was likely to be occupied.

OTHER WORK.

Under this heading are included the standard survey of several small townships, back pegging, levels for drainage and reclamation of lake and swamp lands, surveys of railway severances of property, of reserves of sites for schools and other public purposes, inspections and reports, and generally such miscellaneous survey-work as inevitably arises from time to time.

PUBLICATION OF MAPS.

The photo-lithographic branch of the department, in addition to the maps and plans of the survey proper, is charged with the duty of publishing the plans and illustrations of the other public departments of the colony. The restricted room and plant hitherto at command have hampered operations very much in this important work; but with the early removal of the Government Printing Department to the new brick offices, now in course of erection, there will be an opportunity of making better arrangements for the future reproduction of plans. In Mr. Barron's report in the Appendix will be found an enumeration of the out-turn for the twelve months.

RECONNAISSANCE.

In an interesting report and map in the Appendix, Mr. Mueller gives the result of his exploration during the months of January and February, 1887, of the Clarke and Landsborough, the two principal branches of the Haast River, West Coast, Middle Island. From the mountainous nature of the country no expectation was entertained of discovering any great extent of country suitable for settlement along the courses of these rivers. It was, however, thought worth while to have certainty in the matter, and Mr. Mueller's reconnaissance has set that at rest. There are, taking all the patches of flat open valley, several thousand acres of grass land which may after a time be utilised as a cattle run; although it must be said the experienced gained in the occupation of similar alpine valleys has not been encouraging. There is here more to attract the adventurous traveller in quest of the grand and sublime in nature than the settler in quest of a home; for it is the region of glaciers and snowfields, of avalanches, of precipices, of waste and disintegration of the mountain masses, on a scale which appals with its magnitude.

ROADS TO OPEN UP CROWN LANDS.

The importance of this work has been so often dwelt on that it would be superfluous to make further allusion to the subject, were it not necessary to point out that, unless provision be continued for opening pioneer roads into the bush very little increase of settlement can take place. During the year a great deal of road-work has been done with a corresponding impetus to settlement, for as soon as the timber on the road-line is felled and cleared, and the merest track formed, the settlers follow up and occupy the land. Notwithstanding the depression in prices of stock and crops during the last few years, there has been a very great extension of settlement in the districts opened out and surveyed during that time. Hundreds of farm-homesteads, with villages and townships interspersed, now enliven the landscape, where, but a year or two ago, solitude reigned supreme.

In the road reports of the Chief Surveyors, in the Appendix, will be found detailed the numerous road-lines, each of which have been pushed forward a few miles, or it may be only a mile or so into the wilderness. All these roads are carefully selected before any works on them are undertaken, and are either surveyed and graded throughout as a first step, or, as is often done, lined out on the topographical maps, and the work of locating and grading on the ground done simultaneously with the settlement survey. In this way a complete network of roads for the future use and occupation of the country is provided, which takes cognisance of the best bridge sites, the lowest saddles on the ridges and watersheds, the best ground for sidlings; in short, endeavours to make the most of the natural conditions favourable to good easy road-lines.

The amount and cost of road-work done during the twelve months is summarised as follows:—

In Auckland 43 $\frac{3}{4}$ miles of bridle-road have been made, 51 $\frac{3}{4}$ miles of cart-road, including bridges, formed, and 49 $\frac{3}{4}$ miles of roads and tracks graded ready for construction; thereby assisting to open up for occupation over 100,000 acres of Crown lands, at a cost of £19,055 ls. 1d.

In Hawke's Bay 4 miles of bridle-road have been made, 11 $\frac{1}{2}$ miles of cart-road formed, and 17 miles of bush-road cleared, opening for disposal about 12,000 acres of Crown lands, at a cost of £5,714 14s. 6d.

In Taranaki 17 miles of cart-road have been constructed, including 7 bridges 20ft. to 120ft. in length, and 27 miles of bush-roads have been felled and cleared, developing about 28,000 acres of Crown lands, at a cost of £7,863 17s. 5d.

In Wellington 14 miles of cart-road have been constructed, 23 miles of bush road-lines felled and cleared, and 84 miles of road graded through forest preparatory to formation, assisting to open up over 100,000 acres of Crown lands, at a cost of £8,342 0s. 6d.

In Nelson 2½ miles of cart-road have been formed, 9½ miles have been widened and metalled, and 37½ miles graded ready for construction. The Crown lands benefited are about 11,000 acres, and the cost of the works for the year amounts to £4,610 13s. 2d.

In Westland 7¼ miles of cart-road have been constructed for the benefit of 20,000 acres of Crown lands, at a cost of £4,594 12s. 8d.

In Canterbury about 6 miles of cart-road have been formed, at a cost of £2,529 12s. 7d.

In Otago 37½ miles of cart-road have been constructed or improved, and 33¼ miles of track formed, for the development of over 200,000 acres of Crown lands, at a cost of £8,297 11s.

In Southland 13½ miles of cart-road have been made, 8¼ miles of bridle-track, and 1½ miles cleared for the benefit of 18,200 acres of Crown lands, at a cost of £3,956 2s. 4d.

It will thus be seen that during the past year 171½ miles of road have been graded ready for construction, 68½ miles have been felled and cleared for formation, 89¼ miles of bridle-road have been made, 9½ miles have been widened into cart-road, and 160½ miles of cart-road have been constructed or improved, the total cost being £64,964 5s. 3d.

FUTURE OPERATIONS.

In the future there will be, as in the past, the constant office-work of posting up the record and index and selection maps, to keep pace with the progress of the survey; the preparation of Crown grants, certificates of title, leases and licenses under the various tenures of the Land Act; the land-transfer work; and the attention required by the inquiries of the public. These and other current demands so press on a diminished staff as to leave but little time to prepare for publication the great wealth of topographical information treasured up in the strong rooms of the department. It would be greatly to the public advantage could the issue of maps be accelerated, especially the one-mile scale for local purposes, and the four- and eight-mile scales for geographical information. Every opportunity of pushing this work will be availed of.

In the field the main work will be in the extension of the settlement survey, more especially in the bush districts of Wellington, Hawke's Bay, Taranaki, and Otago. In the other land districts the amount of settlement survey during the season will be regulated very much by the number of applications made for land. In Canterbury minor triangulation and topographical survey will be extended over some of the back high-lying pastoral country, so as to have reliable maps, in anticipation of the re-letting of the runs two years hence. With the force at command this will occupy both the ensuing summer and the next.

REDUCTION OF STAFF.

During the last two or three months the department has been retrenched to the extent of dispensing with the services of six surveyors with their parties and nine draughtsmen; the saving on annual expenditure will be about £6,200. The strength of the department is now 10 chief surveyors, 62 surveyors engaged on field-work, 8 surveyors employed in offices, 60 draughtsmen, 11 clerks and computer, 19 cadets, 1 photographer, and 7 lithographic printers; in addition to which there are 8 surveyors and 18 draughtsmen temporarily employed. The current charge, inclusive of wages of survey parties and all contingencies, is about £85,000 a year, of which about £15,000 will be recovered for services performed, leaving £70,000 chargeable to Crown lands. The number of draughtsmen may appear out of proportion to the number of surveyors, until it is remembered that there are twelve principal survey offices to man, besides ten minor district offices, the closing of any one of which would cause very great public inconvenience to the locality affected.

I have, &c.,

J. McKERROW,
Surveyor-General.

The Hon. J. Ballance, Minister of Lands.

No. 1.—RETURN of FIELD-WORK executed by STAFF and CONTRACT SURVEYORS, and of the COST of the SURVEY DEPARTMENT of New Zealand, from 30th June, 1886, to 1st July, 1887.

District.	Major Triangulation.		Minor Triangulation.		Topographical and Trigonometrical Survey.		Rural and Suburban.		Town Section Survey.		Native Land Court Survey.		Native Land Purchase Survey.		Gold-mining Survey.		Roads, Railways, and Water-races.		Miscellaneous Work.		Total Charges against the Survey Votes for Twelve Months.			
	Acres.	Cost per Acre.	Acres.	Cost per Acre.	Acres.	Cost per Acre.	Acres.	No. of Sections.	Cost per Section.	Acres.	No. of Allotments.	Cost per Allotment.	Acres.	No. of Allotments.	Cost per Acre.	Acres.	No. of Sections.	Cost per Section.	Miles.	Cost per Mile.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Auckland..	390,000	0.48	282,860	0.48	428,600	0.7	60,154	992	2/8.4	114.5	74	51/3.2	5,509	48	9.8	..	..	..	162.6	17 10 0	1,364	1 11	17,012	13 11
Do., at owners' cost	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hawke's Bay	..	..	..	..	63,920	0.58	30,527	168	2/7.6	..	..	..	..	..	..	..	..	..	28.6	13 9 7	685	5 1	4,799	10 11
Taranaki..	..	..	..	..	130,000	0.95	22,862	138	2/1.1	42	69	14/1.3	..	..	..	..	..	..	52.5	10 3 9.9	1,140	2 4	4,499	7 3
Wellington	659,980	0.3	32,476	0.78	408,690	1.27	24,665	241	2/0.2	977	307	28/7	60,176	6	2.5	274,845	2	0.67	42.5	17 7 10	1,302	8 8	11,189	12 2
Do., for associations and railway co.	..	..	..	..	..	..	63,853	676	2/0.5	425	..	..	14,943	..	..	..	..	..	..	..	..	..	..	..
Nelson ..	..	..	101,940	1.1	185,330	1.8	67,314	275	1/6.6	50	222	15/5.8	..	..	..	4,624	133	4/10	14.25	8 7 1.7	1,879	8 8	7,712	4 0
Mariborough	..	..	48,600	1.	..	..	8,691	119	1/8.6	75	3	66/8	..	..	..	30	1 11/	..	3.5	28 5 3	..	..	631	13 9
Westland..	127,791	1	207,666	0.8	188,200	0.48	1,109	147	4/9.7	909	140	21/9.8	..	..	..	356	14	9/6.1	12	4 7 4	233	0 6	2,194	8 6
Canterbury	..	..	..	..	112,849	1.55	23,692	550	1/5.4	372	139	29/	2,780	118	3/1.9	..	..	..	22.75	7 2 11.3	273	6 10	3,359	9 3
Otago ..	..	..	22,824	2.77	..	..	35,752	256	1/9.5	82	48	23/1.7	..	..	..	1,499	60	8/6.2	18	8 19 6	463	15 5	4,654	17 6
Southland	..	..	..	..	..	..	4,971	142	3/10.4	..	..	..	..	..	..	..	..	..	2	18 7 2	60	0 0	376	10 8
Head Office & Lithographic Office	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Means and totals	1,177,771	0.44	696,366	0.81	1,512,589	1.02	343,590	3,704	2/1	2547.25	937	25/4	228,991	324	4.6	691,080	2	0.67	358.7	14 4 4	7,401	9 5	56,930	7 11

Total expenditure £94,404 16 10
 Less refunds 25,298 16 9
£69,106 0 1

No. 2.—ABSTRACT of the SURVEYORS employed and of the WORK on HAND in each PROVINCIAL DISTRICT on 1st July, 1887.

Chief Surveyors.	Surveyors employed.		Work on Hand.					
	Staff.	Temporary.	District.	Trig.	Settle- ment.	Native Block, &c.	Roads, Railways, &c.	Town.
S. P. Smith, A.S.G. ..	19	1	Auckland..	Sq. Miles. 170	Acres. 56,626	Acres. 400	Miles. 389	Acres. ..
Thomas Humphries ..	7	..	Taranaki ..	..	18,000	..	..	..
G. W. Williams ..	4	1	Hawke's Bay	..	12,013	84,400	..	..
J. W. A. Marchant ..	9	3	Wellington	400	111,000	473,000	471	..
J. S. Browning ..	8	3	Nelson ..	..	25,295	..	..	..
H. G. Clark ..	1	..	Marlborough	40	780	..	..	..
G. Mueller ..	2	..	Westland..	..	15,675	..	244	88
J. H. Baker ..	5	..	Canterbury	..	22,186	..	..	..
C. W. Adams ..	6	..	Otago ..	..	24,639	..	..	..
J. Spence ..	1	1	Southland	..	253	..	..	..
Totals ..	62	9	..	610	286,467	557,800	1,104	88

No. 3.—CROWN GRANTS and other INSTRUMENTS of TITLE from the CROWN prepared.

District.	Number.	Cost.	District.	Number.	Cost.
Auckland	1,630	£ s. d. 246 0 6	Westland	87	£ s. d. 17 14 9
Taranaki	217	61 1 0	Canterbury	813	535 3 4
Hawke's Bay ..	69	28 7 0	Otago	826	525 0 0
Wellington ..	305	50 7 0	Southland	257	117 15 0
Nelson	507	305 16 0	Totals	4,717	1,888 17 7
Marlborough ..	6	1 13 0			

No. 4.—LAND TRANSFER WORK.

District.	No. of Plans passed.	No. of Plans placed on Certificates of Title.	Cost.	District.	No. of Plans passed.	No. of Plans placed on Certificates of Title.	Cost.
Auckland	228	710	£ s. d. 1,653 17 10	Westland	205	181	£ s. d. 18 0 5
Taranaki	36	126	62 15 11	Canterbury	191	1,006	563 6 8
Hawke's Bay ..	74	290	357 9 4	Otago	79	1,636	440 0 0
Wellington ..	105	758	187 7 6	Southland	30	778	223 2 0
Nelson	259	192	231 0 0	Totals	1,219	5,797	3,755 15 8
Marlborough ..	12	120	18 16 0				

No. 5.—PHOTOGRAPHS.

Department.	Number of Plates taken during the Year.	Silver Prints.	Department.	Number of Plates taken during the Year.	Silver Prints.
Native	6	16	Premier	11	..
Public Works ..	32	24	Defence	73	..
Survey	261	100	Grasses	8	..
Museum	3	..	Forest	10	35
Marine	12	13	Insurance	16	..
Education	1	..	Colonial Secretary	3	170
House of Representatives	..	40			
Post and Telegraphs	18	..			
Mines	45	46	Total	499	444

No. 6.—LITHOGRAPHIC PRINTING executed from the 1st July, 1886, to 30th June, 1887.

Department.	Number of Separate Printings.	Number of Impressions.	
		By Machine.	By Hand.
Survey	490	290,375	24,085
Public Works	308	63,060	15,169
Premier	19	23,800	56
Marine	4	2,900	2
Geological	24	23,230	15
Forests	92	41,850	4,928
Colonial Secretary	8	..	435
Defence	87	3,700	4,426
Education	12	1,350	1,331
Patent	1	..	200
Government House	3	..	370
Mining	79	135,510	1,152
Telegraph	7	5,900	..
Legislative Council	6	3,000	..
Postal	1	500	..
Customs	2	300	1
Justice	30	1,300	1,926
Railway	60	28,000	4,376
Property-tax	8	10,200	1,701
Treasury	6	2,000	1,964
Public Trustee	17	..	1,240
Insurance	6	..	300
Registrar-General	7	..	355
Native	6	..	12
Totals, Wellington.. .. .	1,283	636,975	64,044

No. 7.—ABSTRACT of LITHOGRAPHS PRINTED during the Year.

At the Head Office	701,019 impressions of 1,027 plans.
At Auckland	6,750 " 36 "
At Hokitika	1,500 " 7 "
At Dunedin	6,200 " 20 "
At Invercargill	700 " 4 "
Total	<u>716,169 impressions of 1,094 plans</u>

Maps mounted at Wellington, 1,468; at Dunedin, 395.

HEAD OFFICE.

General Survey Office,
Wellington, New Zealand, 1st July, 1887.

The correspondence during the year just closed amounts to 9,080 letters and other papers received and despatched, inclusive of 1,306 references from other departments.

The accounts show an expenditure of £159,369 2s. 1d., of which £94,404 16s. 10d. is for surveys, and £64,964 5s. 3d. for roads and tracks to open the lands surveyed or about to be surveyed for disposal. Local authorities have expended £24,331 18s. 2d. under 64 agreements existing at the end of the previous year or made during the year just closed, and the balance has been expended under the direct supervision of the department.

The maps prepared and published during the year are : 19 district lithographs on the one-mile scale, 5 sale plans, 28 mining plans and diagrams, 37 book illustrations, 1 harbour chart, 7 electoral maps, and a number of minor plans and diagrams. For the Forest Department 65 drawings have been made, and for the Mines and other departments 16 sketches and designs have been drawn.

The number of photographic negatives taken is 499, and the number of silver prints is 444. Lithographs and photo-lithographs printed amount to 701,019 from 1,027 diagrams and maps.

The miscellaneous duties of the draughtsmen continue to increase somewhat to the detriment of the real work of the office in the publication of maps. There are twelve kinds of districts of which maps have to be kept up, and these are in a state of change from week to week.

One of the many processes of litho-engraving has been adapted for book illustrations. The views on the margin of Mr. Mueller's reconnaissance map of the Landsborough country are examples. The originals are sketches by Mr. Charles Douglas, one of Mr. Mueller's party, and they have been drawn for lithography by Mr. Deverill.

The Surveyor-General.

A. BARRON.

APPENDICES.

APPENDIX No. 1.

EXTRACTS FROM THE REPORTS OF CHIEF SURVEYORS IN CHARGE OF SETTLEMENT SURVEYS IN DISTRICTS.

AUCKLAND.

To insure facility of comparison with the results of the previous ten years' work, I will briefly refer to the various classes of survey work performed by this branch of the department, under the headings adopted in former reports, and in the general return accompanying this.

Major Triangulation.—At the date of last year's report, Mr. Cussen's operations in the extreme south of the King-country were nearly complete so far as the scope of his instructions allowed. He finished all he had to do in the district lying south of the great bend in the Wanganui River, and left his extreme stations in positions which rendered them available for closure with the Wellington triangulation whenever that work shall have advanced so far north. An area of 390,000 acres was finished, both trigonometrically and topographically, the former consisting of a polygonal system of major, and a Ray-trace system of minor, triangles, averaging respectively twenty miles and six miles in the length of sides. The resulting closures in the Ray traces were twelve in number, showing a mean difference of 6" in bearing, and 0.32 link per mile in length. With the exception of two small districts, the major triangulation now covers the whole of the province, and thus renders the subsequent surveys for settlement purposes of easy accomplishment when required, whilst at the same time the cost is very moderate, being less than one halfpenny per acre.

Minor Triangulation, and Trigonometrical and Topographical Survey.—These two classes of work call for no special remark: they were executed as required in filling up interstices in the major work, as required for settlement purposes. Mr. Gold-Smith's work covered the site of the late eruption of Mount Tarawera, and was undertaken specially to delineate the changes which had occurred in the face of the country owing to that catastrophe.

Rural and Suburban Section Survey.—The total area prepared for settlement under this heading is 55,979 acres, which is slightly in excess of the amount of the previous year; but a somewhat remarkable increase is shown in the number of sections laid out, which total 374 more than those surveyed in 1885–86. The average area of sections therefore is much smaller. In the previous period this average was ninety-one acres, and in the present period fifty-nine acres each section. This is due to the large number of sections taken up under the village-homestead special-settlement system of perpetual leases, under which the area of each section is limited to fifty acres. Up to date, 565 sections have been selected under this system, a large proportion of which are in occupation of the selectors. The demand for lands of this tenure has been so great during the year that thirteen of the surveyors have been kept almost exclusively at work preparing them for selection, and other systems of land-alienation have been, in a great measure, set on one side in the interest of village-settlement. To meet this great demand, special means had to be adopted, and therefore wherever it has been possible the sections have been sketched out on selection-plans before actual survey. The selections were made, and frequently the selectors were on the ground, before the surveyors were able to point out the exact position of the boundaries. Although this has, in some cases, been the cause of disappointment to the selectors, and the source of considerable delay to the surveyors in having to put the selectors in approximate possession of their sections, it enabled large numbers of men to leave the towns, where they were earning nothing, and allowed them to obtain work on the village roads, or on the gum-fields in the vicinity. Most of the land selected is of very fair quality, but in some instances it is inferior, and such that no one can make a living off it, though, in these cases, there are gumfields adjacent, by working on which the selectors can make enough to live on.

Included in the area of 55,979 acres is an acreage of 4,551 acres surveyed in order to allow of the issue of Crown grants, and another of 6,354 acres representing sections which had been sold many years since, but the boundaries of which had never been marked on the ground. The cost of these surveys has been £1,220 11s. 2d., and this is fairly chargeable as an old provincial liability. A slight increase in the average cost of section survey per acre is shown this year, and is to be accounted for by the smaller size of the sections. It amounts to 3s. 2d. per acre. Part of this increased cost is also due to the fact that many of the roads on which the sections abut have been graded ready for construction.

One special settlement, containing an area of 3,567 acres, and 34 sections, has been surveyed by contract—Government advancing the cost in the first instance—and two authorised surveyors have been engaged part of the year in assisting at the village settlements.

Under the homestead clauses of the Land Act, an area of 3,767 acres in 24 sections has also been surveyed by the authorised surveyors, who have been paid by fees deposited by the selectors.

Town Section Survey.—No new towns or villages have been laid off during the year: the work

done consists in the resurvey of parts of old townships preparatory to their being offered for sale, the re-marking being necessary on account of the loss or destruction of the former pegs.

Native Land Court Surveys.—The small area of 5,468 acres has been surveyed by the staff surveyors, whilst 157 blocks or divisions of blocks, containing 145,583 acres, have been surveyed by authorised surveyors under the direction of the department, the cost of survey being borne by the Maori owners. A large proportion of this area is the subdivision of blocks which had previously passed the Court, and came in for subdivision and individualisation during the year. The operation of the Native land laws in force, together with the general depression, has almost entirely put a stop to the preparation of fresh blocks for Native Land Court purposes.

Native Land Purchase Surveys.—The return for this year is *nil*, as far as surveys made by the departmental officers are concerned; but an area of 416,235 acres has been surveyed by authorised surveyors, at the cost of the Land Purchase Department.

Roads, Railways, &c.—Nearly the whole of the 162 miles surveyed during the year has been done in exercise of the road rights, and most of it lies in the Poverty Bay District, and has been executed by Messrs. Pickett and Armstrong in a difficult country.

Other Work.—Under this heading appears sundry work performed by the officers of the department, such as inspection, office-work, reports on land and roads, redefining certain boundaries, and services rendered to other departments which do not find a place under the other headings.

Standard Survey of Towns.—Mr. Williams was engaged for a short time during the year in extending the series of stone standards or fixed points in the suburbs of Auckland, which work was subsequently taken up by Mr. Weetman in connection with the street-alignment survey of Auckland, in which fair progress has been made. This latter is a most tedious process, involving the search into a large number of grants and conveyances, preparatory to the field-work. Each block surrounded by streets is then dealt with separately, and as it affects the adjacent ones; and, after a careful survey of the occupations, a street line is determined for each block, within which the future Land Transfer surveys are to be confined. The portion already completed has proved of very great assistance, and the benefit of it will become more and more apparent both to the licensed surveyors and to the department, and consequently to the public, as time goes on. The recent removal of Mr. Weetman to take charge of the Poverty Bay District will, I fear, put a stop to the work for some time to come.

Land Transfer Surveys.—Mr. Foster reports having passed 206 plans, containing 112,005 acres, divided into 1,358 allotments; and Mr. Buscke, at Gisborne, has passed 22 plans, with an area of 7,094 acres, in 124 allotments. We have on hand, passing through the office, and referred back to the surveyors for further information, 51 plans—a number much larger than it ought to be; but with the insufficient number of draughtsmen at present employed in this work it is unavoidable.

Field Inspection.—All of Mr. Williams's time, excepting the short period engaged on village sections and standard survey, was devoted to inspection of the field surveys, many of the staff surveyors having been visited by him. He reports that the work is generally very good. Cases, however, have occurred which show the great necessity for a constant field check. Mr. Williams having now left this branch of the department, such inspection as is necessary will devolve on myself and the District Surveyors; and I fear that, in consequence of the amount of this work to be done, the inspection is likely to suffer. Mr. Barnard has also been constantly in the field inspecting the surveys in his district, and has managed to test fifty-six different surveys, most of them showing that some amendment was necessary, though the work on the whole is good.

Office-work.—A considerable part of the year's work has been devoted to office matters in connection with the village-settlement scheme, and, as two of the office staff were transferred to the field for a considerable portion of the year without any substitutes being provided, it naturally results in our having very large arrears of work on hand at the present time. At no prior period during the past ten years has there been such an accumulation of work, principally consisting of original maps of lands for disposal, which remain unchecked and unrecorded, and, as a consequence, the lands cannot be offered for sale or selection. The number of block sheets prepared to date, mostly on the 10-chain scale, is 1,826, an increase of 283 for the year for the two offices. A good number of secondary record maps have been prepared during the year, the Gisborne office being well up to date in this branch. I am again under the necessity of calling attention to the inadequacy of the safe-accommodation in Auckland. The fireproof safe is crowded with valuable maps and plans to such a degree that many are constantly damaged in handling through want of proper space to contain them; whilst the letter records are entirely unprotected from fire. In the Crown-grant branch there are no arrears of certificate of title whatever, although a good many requisitions for Crown grants are unavoidably held over pending the survey of the lands. The certificates to carry out orders of the Native Land Court are likewise greatly in arrear; but, as all of these depend on surveys for which there is no money available, they are likely to remain as arrears. Mr. Kensington has had lithographed this last year six of the counties on the 80-chain scale, and these maps have proved most useful, and will continue to be so, until they can be replaced by the photolithographs of the survey districts, none of which have been published during the year. Thirty-six plans of blocks and sale-plans have been lithographed locally, 6,750 copies having been struck off. Sheet No. 5, on the four-mile scale, which embraces the remainder of the province not already prepared on that scale, will probably be furnished during the ensuing year. The correspondence shows no sign of decreasing; indeed, in consequence of the greater number of field parties and roadworks going on, it has increased a good deal. Mr. Johnston, the Accountant, has passed 1,725 vouchers, which includes expenditure for surveys, roads, homestead surveys, Land Purchase Department, and State Forest, and covers an expenditure totalling £46,012 2s. 2d.

Work for the Ensuing Season.—The surveyors have on hand a considerable amount of work, some of it complete in the field, but the plans of which not being ready, the results will only appear in next year's report. In addition to this there is a large amount of work in scattered districts

awaiting its turn to be done, and to this our attention will principally be given. Happily the triangulation is available now in nearly every part of the province, and in most districts it has been broken down into minor series, so that little but filling up gaps here and there remains to be finished. This, of course, allows of the full strength of the staff being turned to the preparation of lands for settlement, and for laying out roads where the rights exist.

During the past year one of the cadets, Mr. E. F. Adams, has passed on to the grade of assistant surveyor, and is fully engaged in doing good work on the village settlements, whilst two others will have completed their cadetship immediately. Mr. G. W. Williams, who has for so long served as Inspector in this district, was transferred in April to the Chief Surveyorship of Hawke's Bay, and Mr. J. Orme Barnard, Inspector at Gisborne, left the service on the 30th ultimo in consequence of the reductions, his place being taken by Mr. S. Weetman, the senior District Surveyor. I cannot part with these officers without placing on record my sense of obligation to them for the able and willing manner in which they have seconded my efforts to carry out the duties intrusted to me.

S. PERCY SMITH, Assistant Surveyor-General.

HAWKE'S BAY.

Topographical and Trigonometrical.—Of Crown lands in the Weber and Tautane Districts 9,600 acres were triangulated by Mr. F. Rich, for the purpose of controlling current settlement surveys, and 54,320 acres in the Maraekakahu District by Mr. C. D. Kennedy by contract at $\frac{1}{2}$ d. per acre. A system of minor triangles was also extended over a sectional survey of about nine thousand acres, let to Mr. A. H. Ross; but the cost of this was included in the contract.

Settlement Surveys.—The area treated under this heading is more than double that of last year, being 30,527 acres, against 14,641 acres in 1885–86. The average size of sections was 182 acres, and the average cost per acre 2s. 7 $\frac{1}{2}$ d. This rate compares favourably with that last year (when it was returned at 3s. 8d.), especially when it is remembered that as a rule each new block opened is more difficult of access and in rougher country. The whole of this was forest, with the exception of 665 acres by Mr. W. Hallett in the Motoutaria District.

Native Land Court Surveys.—These appear to have been altogether in abeyance lately, as there is nothing to return under this class; but I believe this is owing to the absence of any sessions of the Court.

Land Purchase Surveys.—A block of land containing some 84,400 acres, situated in the Takapau and Mangatoro Districts, is under survey for land-purchase purposes by Assistant Surveyor G. Watson, who joined the staff here in January last; but there is nothing complete to return.

Road Surveys.—Only twenty miles are returned under this class, thirteen miles having been laid out by Mr. Hallett through Native blocks, and four and a half miles by Mr. A. H. Ross on the Wainui–Porangahau Road.

Railway Surveys.—Of railway-land surveys 8.6 miles have been executed under contract by Messrs. C. D. Kennedy and H. K. Hovell, at a cost of £172 10s., chargeable to the Public Works Department.

Other Work.—Under this heading may be included the standard surveys of the townships of Danevirke and Norsewood, at a cost of £433 6s. 3d., including revision of former surveys, both by Mr. Hallett. This officer retired from the staff on the usual terms in December last.

Land Transfer Surveys.—Mr. Dennan, the Chief Draughtsman, has examined and recorded seventy-four plans, of an aggregate area of 31,333 acres, divided into 509 lots, besides supplying forty-three certificates for the District Land Registrar, at a total cost of £297 9s. 4d.

Office-work.—The cost of work done for other departments and for local bodies is £234 3s. 11d., the principal items being £83 4s. 1d. for examination of railway-land plans chargeable to Public Works, and £88 7s. for preparation of the various instruments of title.

Future Operations.—Messrs. Tone and Rich are to continue settlement surveys in the Weber and Tautane Districts, 25,000 acres of Crown land still remaining to be dealt with. The Te Ohu Block, containing some fourteen hundred acres, has also to be prepared for settlement.

In conclusion, I would remark that during the short time I have been in this district there has been ample proof that there is a constant unsatisfied demand for land, provided that it can be obtained of fair quality and accessibility, and I sometimes have inquiries from distant parts of the colony for land which we have not even begun to survey.

G. W. WILLIAMS, Chief Surveyor.

TARANAKI.

Triangulation.—The triangulation completed by the Taranaki staff is 130,000 acres, which, with what has been done on the Wanganui by the Wellington surveyors, practically finishes the work in this district. As the triangles over the forest area are of from five- to eight-mile sides, breaking-down will have to be resorted to in the event of settlement work, which can be easily done by the sectional surveyor as required. This course avoids the heavy immediate expenditure needed to cover this extent of country with small triangles, which for many years will not be generally required, and over a considerable area not at all. With the triangulation already done topography has been combined, so that we have now a very complete and valuable map of the whole district.

Rural and Suburban.—Of this, 22,862 acres have been completed, at 2s. 1d. an acre. I find that during the year some 27,000 acres have been selected under settlement conditions, and reserved; but there are, exclusive of 14,000 acres surveyed but not offered, still about 40,000 acres open for settlement in different parts of the district, so that by keeping the surveys going at the present rate intending settlers will have ample choice, and the surveys for some years be well in advance of the demand. About half the area surveyed this year, which is not yet open

for selection, is eastward of and distant some ten miles from Inglewood, in and about the Waitara Valley. As it is fine country, mixed, open, and forest, and well adapted for small farms, it will, doubtless, be rapidly taken up. The remainder surveyed this year lies inland of Hawera and Patea.

Town Sections.—Of town-section work but little has been done. A small township on the Waitara River has been laid off, and a few village lots at Pungarehu.

Back Pegging of Old Work.—This was expected to have been completed this year, but it has been impossible to assign more than one officer completely to it: notwithstanding, a considerable area has been finished; and, considering that the sections were small, with stream boundaries, which had to be traversed, the cost of 8d. is very moderate. For the preceding two years it was 8d. and 8-9d. There still remain about 8,000 acres of this to finish it down to Inglewood.

Roads and Railways.—Thirty-five miles of old roads in the Oakura District have been redefined, surveyed, and permanently marked throughout. This has been tedious work, owing to the very careless manner in which fences had been erected, in very many cases quite haphazard. Included also in this column are fifteen miles and a quarter of railway-land plans, completing the whole of the lines in this district.

Other Work.—Under this head there is £138 18s. 10d. for completing the standard survey of New Plymouth; and £109 19s., cost of surveying and levelling the Ngaire swamps in view of draining them, and levelling and preparing sections for work on roads to open up Crown lands. These are the principal items, and absorb nearly the whole amount, the balance being composed of small sums.

Work done for Other Departments.—The cost of work done for other departments is £246 18s. 9d. The Public Works and Land Transfer Departments were the principal ones accommodated.

Inspection.—I have inspected the work of each member of the field staff during the year, and have much pleasure in reporting the excellent and reliable work done in each case. The country in some instances has been intricate, but the road-lines have been admirably laid out. Inspection has also been made of authorised surveyors' work both under the Public Works and Land Transfer Acts with satisfactory results.

Office Work.—On Crown-grant forms 926 plans and descriptions have been placed; and in Land Transfer work thirty-six surveyors' maps have been examined and passed, besides 525 plans placed on certificates of title. The number of tracings drawn for photolithographing has been eighteen—viz., one large one of the provincial district, two mile-district maps, ten trig. and five ordinary scale. Twenty-two surveyors' maps have been checked, and seventeen block-sheets compiled.

Proposed Operations, 1887-88.—The principal settlement work will be the extension of the surveys of last year, both at Waitara and inland of Hawera. These are in hand at the present time, but only in the early stages. On account of the mixed character of the country I am of opinion that the small grazing-run system will be very largely adopted over the at present unsurveyed lands in this district. Forced by the nature of the country, these runs will probably interlace with the ordinary sections, the best of the land being cut up into holdings up to 640 acres, and the inferior portions made into small runs from that area upwards, according to the suitability of the country. Back pegging is now almost completed, some 8,000 acres only remaining to be done. It is anticipated that there will be considerable survey needed in subdividing Native reserves along the coast. Already the Native Land Court has treated in this manner seven blocks, containing about ten thousand acres, dividing into eighty holdings. These surveys will have to be made before certificates can issue. It is very probable that during the year a very large extent will be similarly dealt with.

THOS. HUMPHRIES, Chief Surveyor.

WELLINGTON.

Major Triangulation.—Mr. J. A. Thorpe extended a series of triangles over the Waimarino country to a junction with the Auckland staff's work; the comparisons are not sufficiently advanced yet to give results. Mr. Joseph R. Annabell observed a chain of triangles covering the upper Wanganui valley, between Tuhua and Manganui-o-te-Ao, completing the connection with Mr. Skeet's Taranaki series. Some further computations are required, and then we shall be in a position to ascertain the trigonometrical and geodesical elements along a direct triangulation between Napier and New Plymouth. Both officers above named worked under exceptional difficulties in a remote and inaccessible country. Mr. A. D. Wilson, Geodesical Surveyor, also had considerable trouble in covering the country south and west of Ruapehu with major triangles; he lost much time owing to flat-topped forest-clad hills, and the snow on the mountains.

Minor Triangulation.—A limited area under this heading appears on the return, and this comprises gaps which existed in the general series of the districts of Mangaone, Tararua, and Waiohine.

Topographical and Trigonometrical Surveys.—The three officers who executed the major triangulation availed themselves of the opportunity of covering about four survey districts with minor triangulation, and in ascertaining the general topography of the country; and Mr. District Surveyor John Annabell is credited with 78,800 acres lying to the southward of the bulk of the area returned under this heading. The district operated upon is that lying between the Ranana-Murimotu track and the Tuhua country, very remote and inaccessible from the settlements, covered with forest destitute of roads or tracks.

Rural and Suburban Section Surveys.—The localities of these surveys are in the Otairi (Clifton Association), Otamakapua (Pemberton Association), Alfredton, Mangaone, Kopuaranga, and Mangahao Districts; comprising, generally, hilly, forest, and dense scrub country. The staff surveyors devoted, as usual, much time to the thorough exploration of road routes, not hesitating to

thus increase the cost per acre of their surveys by a few pence, in the full knowledge that the saving and advantage to the public in after-times would be incalculable. I consider the work has been done in a professional, workmanlike, and satisfactory manner.

It will be observed that the area of contract surveys paid for by the associations under the special settlement regulations amounts to 38,406 acres, and that the Wellington-Manawatu Railway Company's land-endowment surveys amount to 25,447 acres. I inspected these surveys as well as my other duties permitted, but it was necessary to call in the aid of some of the staff officers to verify the contractor's work. The average cost of these contract surveys, without including expense of inspection and cost of extras, appears to be 2s. 0½d. per acre.

Town Section Surveys.—The bulk of the surveys of this class is made up of the villages of Hastwell, Rangiwahia (Pemberton Block), and Mangatainoka Bridge. The contractors referred to above also laid off and surveyed 608½ acres as township sites.

Native Land Court Surveys.—Mr. John Annabell executed nearly the whole of the area tabulated. The names of the blocks are Rangitatau and Raitihi. Authorised surveyors surveyed 14,943 acres. The Awarua Block, of about 300,000 acres, in Upper Rangitikei District, is now under survey.

Native Land Purchase Surveys.—The work done for the Land Purchase Department was the definition of the western, southern, and eastern boundaries of the Waimarino Block, before referred to. The area allotted to the surveyors specified in the return has been determined on the basis of the sums expended by each. Mr. Thorpe's portion is not given, although he has all but completed the survey of about 92,600 acres.

Road and Railway Surveys.—Pressure of other duties did not permit of this class of work being attended to as fully and as promptly as it should have been; nevertheless many miles of road were legalised in the Wanganui and other districts, and land plan surveys were made along the North Island Trunk and Masterton-Woodville Railway-lines.

Office-work.—The office-work calls for no special mention on the score of novelty—it was similar in all respects to that performed in former years; but the calls upon the staff continue to exceed the power to satisfy all demands; consequently it was impossible to overtake arrears, to compile necessary and useful maps, to have the ordinary draughting executed in an orderly and neat manner, or to give to the public information (in the form of lithographs, new maps, or fresh editions of those already published) keeping pace with the great advance of the surveys in this district. As instances of what is needed it is only necessary to point to the incomplete Crown-grant record plans, uncopied standard and compiled plans, and unpublished triangulation, topographical, and sectional surveys. Mr. Mackenzie, however, did the best he could under the circumstances.

The office staff's chief duties comprised—the examination and verification of all plans received from the field staff, contract, and private surveyors (this duty has been efficiently performed by Captain Hewitt); the reduction, copying, and recording upon compiled plans, of the verified work; the preparation of plans for photolithographing; and the furnishing of maps, schedules, and other information and data to local bodies, other departments, and the public.

The Accountant and Clerk, Mr. G. Wright, Mr. Bannister, and the cadet have been completely overtaxed with the joint work of the Survey, Crown Lands, and Native Lands Administration Offices, and it is only right to record my obligations to them, and appreciation of their ability and attention.

Remarks.—During the year 1886–87 it will be observed that a large staff of surveyors was employed, spread over the whole Wellington Provincial District—(1) engaged mainly in extending triangulation to define the topography and boundaries of blocks of land for the Native Land Court, so as to aid the operations of the Land Purchase Department; (2) in surveying land into suitable-sized farms and homes for the people; (3) in locating, legalising, or defining lines of communication to carry the future traffic of the country; (4) and, with the aid of the office staff, in attending to the miscellaneous requirements of public bodies, Government departments, and the public at large.

Proposals as to Future Operations.—It is anticipated that the Waimarino and Rangitaua Blocks will require to be subdivided, the latter for settlement, and the former for Native Land Court purposes and also for settlement.

The Maungakaretu Block, on which Mr. A. D. Wilson, Geodesical Surveyor, has made extensive surveys, will have to be further sectionised and thrown open to selectors.

West Waitapu, which has been thoroughly explored and to a great extent intersected by proposed road-lines by Mr. District Surveyor Dundas, should be cut up and offered for sale at an early date.

The Otamakapua North Block contains some extensive areas on the Upper Kiwitea and Maungawharariki Streams, which should be prepared for occupation by farmers and runholders.

The Crown lands lying between the Oroua and Pohangina Rivers are sufficiently good to warrant that they be treated in like manner.

The Puketoi country should also be cut up for sale.

The Kaiwhata-Rewa, Mikimiki, and Wangaehu (Wairarapa) Blocks should be prepared for the market.

Triangulation should also be extended over the Awarua and adjacent blocks in Upper Rangitikei.

It is well to add that proper provision should be made for roads to open up Crown lands for sale.

J. W. A. MARCHANT, Chief Surveyor.

MARLBOROUGH.

Triangulation.—It will be observed that under the several headings in the general return of triangulation no work of this character has been undertaken during the past season. The triangulations completed by Mr. Wilson cover for the most part those portions of the district in which section, road, Land Transfer, and other like surveys will probably be required; no material extension, therefore, it may be expected will be wanted for some time. There is, however, a small triangulation in the Oriero and Gore Survey Districts which I contemplate doing this season, from Cape Jackson to Forsyth Island, to connect the Pelorus and Queen Charlotte Sound triangulations, embracing an area of from twenty to twenty-five thousand acres, and covering Port Gore and Waitui, Titirangi, and Auakoa Bays.

Rural Section Surveys.—These call for no special remark beyond stating that three sections were surveyed under application for deferred payment, one for perpetual lease, and one for cash.

Revision Section Survey.—These are a part of the legacy of old defective surveys the department is from time to time called upon to correct. They are situated in forty-three different localities in the Gore, Arapawa, and Linkwater Districts, and they include the revision and connection to trig. stations of nearly all the freehold sections in Queen Charlotte Sound. 4,429 acres were reported last year as field-work completed. The resurvey shows that most of the original surveys were very loosely done, and are quite unreliable. In several cases the sections were found to be about half a mile out of the positions shown on the maps, and the coast-line on which the sections abut was found in many cases to be from 5 chains to 20 chains in error. With few exceptions no indication of the ground-marking existed, and it was found necessary in nearly every case to retrace the coast, and fix the position of the section by the natural features and configuration of the coast. Front and direction pegs were put into every section excepting where two or more sections adjoined belonging to the same owner, in which case the lines dividing the sections were not marked on the ground. There were twenty-one closed traverses in connection with these surveys, the mean closing error being 1·3 link per mile. Many of the traverses of isolated sections are checked by bearing, the difference between observed and calculated bearings seldom exceeding 1'.

Town Section Survey.—Two sections were resurveyed for issue of Crown grant, and one for Land Transfer purposes. The cost appears great, but this is owing to most of the surveyors' time being occupied in determining the frontage street-lines.

Village Homestead Special Settlement.—This block is divided into fifteen allotments of about half an acre each, the remaining eighteen allotments ranging from three to ten acres.

Gold-mining Survey.—This was a licensed holding for gold-mining purposes in the Queen Charlotte Sound Mining District. It is situated at Jackson's Head, is difficult of access except in fine weather, and most of the time was taken up in travelling.

Office and Land Transfer Work.—During the year thirty-four surveyors' plans have been received and checked, and plotted on to their respective block-sheets and record-maps. Thirteen new block-maps have been prepared, and more or less work placed on each. Six certificates in lieu of Crown grants in triplicate were prepared.

In the Land Transfer branch twelve plans were passed, and tracings of them supplied to the District Land Registrar, and 7 applications, 104 mortgages, 5 leases, and 73 transfers were examined. Diagrams in duplicate were placed on sixty certificates of title, representing dealings with nine original sections in 176 allotments. One new record-map (rural) was constructed and brought up to date. During the year the Chief Draughtsman was absent on leave one month, and the Assistant Draughtsman was away for two months on sick leave.

Proposed Operations.—The principal operations in this direction will be—25,000 acres of trigonometrical survey with topography, from Jackson's Head to Forsyth Island; connection of Pelorus and Queen Charlotte Sounds; completion of revision surveys in Queen Charlotte Sound, 1,540 acres, 13 sections, in two groups—sub-trig.-stations ready, and work just commenced; survey of fourteen small grazing-runs, with adjoining forest reserves (13,000 acres), in the Pelorus Sound; and section surveys as requisitions are sent in by the Land Office.

HENRY G. CLARK, Chief Surveyor.

NELSON.

Minor Triangulation without Topography.—Mr. W. D. Murray has completed 100,000 acres over the Croixelles, French Pass, south end of D'Urville Island, and Pelorus Sound; and the unconnected old surveys and new applications can now be located in that part.

Topographical and Trigonometrical Surveys.—Messrs. Smith and Thompson have completed 125,030 acres at a cost of 1½d. per acre, part of which was completed in the field during the previous season at the head of the Stanley River and Lake Guyon, skirting the eastern side of the Spencer Ranges and down the Wairau to Tarndale. This triangulation was brought up from the Hanmer Plain base-line, and closed on Tarndale 19,469·1 with a difference of ·6 link. The number of polygons is 10, the mean close being 3", the greatest and least differences being 9" and 0" respectively. In twenty-six triangles the mean error in summation is 3"·6, the greatest 9" and least 0" also. It will be seen that these officers keep up the high standard of their work. Sixty thousand acres of topographical work has been done, taking in the main range which forms the boundary of circuits, counties, electoral districts, &c., hitherto altogether undefined, but which is now located in true position.

Sectional Surveys.—There have been surveyed 67,314 acres, at an average cost of 1s. 6½d. per acre. Of this, 32,018 consist of ten leases in the Amuri District and 10,660 in the Maruia Block surveyed for sale; the remainder consists of scattered applications in heavy-bush valleys. The current applications during the year have been chiefly made in the Nelson and Collingwood Districts, in which arrears have accumulated. The unsurveyed arrears at the end of last year were 56,336 acres, in 223

sections; at the end of the present year, on the 30th June, they amount to 25,294 acres, in 184 sections. Mr. Bullard has completed the Maruia Block, and Mr. Greenfield the revision survey at Lake Rotoiti.

Gold-mining and Mineral-Lease Surveys.—There have been a larger area and twice the number of sections surveyed in this class than last year. In the beginning of the year a number of applications in the Reefton and Owen Districts were made, and the prospect of a company being formed at Collingwood to work the coal-deposits there led to more applications for mineral leases.

The District Surveyor at Reefton has been fully employed with mineral and mining surveys. Mr. W. C. Wright had to be detached from the Nelson office to undertake mining surveys at the Owen, no other officer being available. Mr. T. Sadd had to be taken from sectional work in the Nelson District to survey mineral leases at Collingwood, urgently required to enable companies to be formed.

Fewer applications have been made in the Grey District; and one or two large mineral-lease applications have come in recently in the Buller District.

In October Mr. W. C. Wright was sent from the Nelson office to make a special survey and report on the Great Republic Company's mine at the Ngakawau, for the Mines Department.

In the Reefton District there are seventeen mining surveys in arrear, and fifteen in the Buller. In the Collingwood District there are still three mineral-lease applications unsurveyed, amounting to 1,500 acres.

Town Section Survey.—Mr. J. Snodgrass laid off eighty-four sections on the Colliery Reserve, Wangamoa, upon which miners had settled. Mr. Montgomerie revised forty sections and brought them under standard survey at Reefton. As the land near the Owen reefs was being rapidly occupied by miners, Mr. F. Greenfield laid off a village site, and located ninety-seven sections; and buildings are being rapidly constructed there.

Office and Land Transfer Work.—There has been more work done this year in the Land Transfer branch than last, owing to temporary assistance being given by Messrs. Spreat and Mason, and occasional help by officers taken from survey work: 192 certificates under the Transfer Act, and 148 certificates of title for purchased sections, have been prepared, requiring 867 plans. There have been 213 plans examined and passed. Forty-six plots, fifty-three registered plans, and eleven tracings and compiled plans have been made. There are about 150 certificates in arrear, and purchases of leases being constantly completed makes it difficult for us to keep up this current work. More Crown-grant record maps require to be constructed, which we have not been able to undertake owing to pressure of other work. There have been 359 leases and licenses, requiring 766 plans, prepared. Thirty-seven new block sheets have been made, and thirteen new district application maps have been compiled. Two new plans of mining districts have also been compiled from recent surveys. One hundred and nineteen plots and forty-four tracings have been received from field surveyors, and checked and recorded during the year. In addition to current survey work there has been the preparation of tracings and specifications for roadwork, placed under the charge of the department.

Work in Hand and Proposed Operations, 1887-88.—In the Buller Circuit Mr. Snodgrass has about three triangles to connect the Buller triangulation with the Karamea, and to close on that base as a check upon the work. He has also in hand the sectioning of 2,000 acres of bush land for special settlement at the Little Wanganui, but, as he is the only officer in a large district, he will require some assistance. Messrs. Smith and Thompson, in the Amuri, have about five thousand acres of triangulation and about eight thousand acres of leasehold in hand, up the Ada and Henry Valleys; and it is proposed to complete the triangulation between the Waiau and Doubtful Rivers, which will define a further portion of the main range, forming at present a very undefined boundary of county, ridings, and electoral districts. When the back country is open, traverses of roads not yet legalised can be undertaken, after the last season's work has been plotted. Mr. W. D. Murray, having now completed the triangulation of the bays and sounds round the French Pass, will be able to locate all the old surveys and new applications for land in the several bays, which will occupy the greater part of the year. Mr. Sadd will require to complete the field-work of about three thousand acres of applications and revision at Kaiteiteri, partly completed when sent to the Collingwood District, to which part it will be necessary to return in order to overtake the arrears accumulated there, amounting to sixty-five scattered applications, containing 6,000 acres. Messrs. Greenfield and Bullard, having completed their respective surveys, are required in the Motueka and Waimea Districts to overtake arrears of applications, amounting to seventy-four sections, with an area of 7,494 acres. There are also about twenty-six applications for land distributed in isolated parts of valleys tributary to the Buller River.

JOHN S. BROWNING, Chief Surveyor.

WESTLAND.

THE tabular statement furnished herewith gives the work done during the year, and the explanatory notes on said statement make it unnecessary for me to enlarge upon the various descriptions of survey executed during the year. In regard to the triangulation, however, I beg to report that it is finished, at least as far as present requirements are concerned.

Mr. Murray during the past season carried it down to Martin's Bay, and connected there with the Otago triangulation, and the Westland District triangulation may therefore be said to be practically completed, seeing the network extends now from its northern to its southern boundary along the 220 miles of sea-coast, over a belt of land of an average width of fifteen miles, and also across the dividing range into Canterbury at three points—namely, by Hurunui Saddle, Arthur's Pass, and Rakaia headwaters—and into Otago by the Haast Pass. The closure with the Martin's Bay circuit triangulation is not satisfactory: the difference between it and the Westland triangulation amounts

to 6.3 links per mile, whereas the difference between Mr. Wilmot's triangulation, carried across the dividing range from Mount Nicholas circuit,* is only 2.9 links per mile. The exact results stand thus:—

By Martin's Bay triangulation* station, E to C	=	13886.4
By Westland triangulation station, E to C	=	13897.4

Difference	11.0
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or 6.3 links per mile.

By Mr. Wilmot's triangulation station, E to C	=	13892.3
By Westland triangulation station, E to C	=	13897.4

Difference	5.1
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or 2.9 links per mile.

Mr. Murray's work balances admirably, and evidences great care throughout; but, in order to decide satisfactorily whose determination of side E to C is correct, the careful measurement of a verification base-line at Martin's Bay will have to be undertaken.

I regret I am unable to furnish with this report the differences of latitude, longitude, and convergency between Jackson's Bay circuit initial and the initial stations of Martin's Bay and Mount Nicholas circuits. Nor can I state now how the Westland altitude observations agree with those of Otago. These calculations are in hand, and I shall inform you of the result as soon as possible.

In consequence of the further reduction in the staff, and the great increase of late in mining surveys, I expect it will be some time before the two remaining staff surveyors are able to overtake the arrears in section surveys.

These amount now only to 172 sections, of a total area of 15,675 acres, scattered over the district. There remains also a considerable amount of office-work, mapping, and calculations still in arrear, which I hope to be able to overtake while the present reservation of lands for Midland Railway purposes remains in force.

GERHARD MUELLER, Chief Surveyor.

CANTERBURY.

Minor Triangulation and Topography.—Mr. Brodrick has finished the triangulation of the Waimakariri Gorge, which will enable me to complete the topographical plans of all the country within fifteen miles of both sides of the proposed Midland Railway. This triangulation, which was carried on from bases measured by Mr. Maben in the Oxford Survey District, and by Mr. C. W. Adams near Castle Hill Station, closes on work formerly done by Mr. Brodrick in the Upper Ashley Survey District in 1880, with the following results:—

Survey District.	Trig. Station.	From Oxford to Grasmere Base-line (Survey by T. N. Brodrick, 1887).	From Ashley Base-line (Survey by T. N. Brodrick, 1880).	Difference.	Error per Mile.	Mean Error per Mile.
		Distance.	Distance.	Links.	Links.	Links.
Upper Ashley ...	N.O.	24238.8	24238.5	0.3	0.10	} 0.59
" ...	O.B.	28418.9	28424.	5.1	1.44	
" ...	B.D.	28079.6	28081.3	1.7	0.48	
" ...	D.E.	21903.4	21905.4	2.0	0.73	
" ...	E.U.	14400.95	14401.3	0.35	0.20	

which cannot but be considered satisfactory considering the difficulties—viz., the great altitudes of some of the stations in the Puketeraki Range, the nor'-westers which during the early part of the summer blow with terrific force through the Gorge, and the fogs which in the autumn so often envelop the higher peaks and made it necessary for the surveyor to ascend time after time elevations of 6,000ft. before he could make the required observations. The work now concluded gives us, however, a great deal of topographical information of the Waimakariri and its tributaries, which will be of very considerable value to the department in dealing with the country. The area triangulated is 81,552 acres, and cost a small fraction over 1d. an acre.

Topographical Survey.—Mr. James Hay has completed a traverse survey of the whole of Lake Ellesmere Reserve, comprising an area of 72,789 acres, of which 41,492 acres are covered by the actual waters of the lake when at its lowest level, leaving 31,297 acres of flats more or less covered with water, according to the state of the lake. The exact positions of all the rivers and creeks flowing into it have been traversed, the spits or ridges of higher land which extend into the lake have been carefully traced out, and all the clearly-defined lines of demarcation between the different kinds of vegetation have been delineated, so that the areas of the various qualities of land or pasture of which the lake flats consist can be determined. Levels have been taken in three places to ascertain the best line for the proposed new channel for the river Halswell, and other levels have been taken connecting the various spits, in order to decide whether it is practicable to raise a dam or dyke to keep the waters of the lake from covering the large grazing-flats which extend into the lake between the Halswell and No. 1 Creek. A detailed report on this will be submitted.

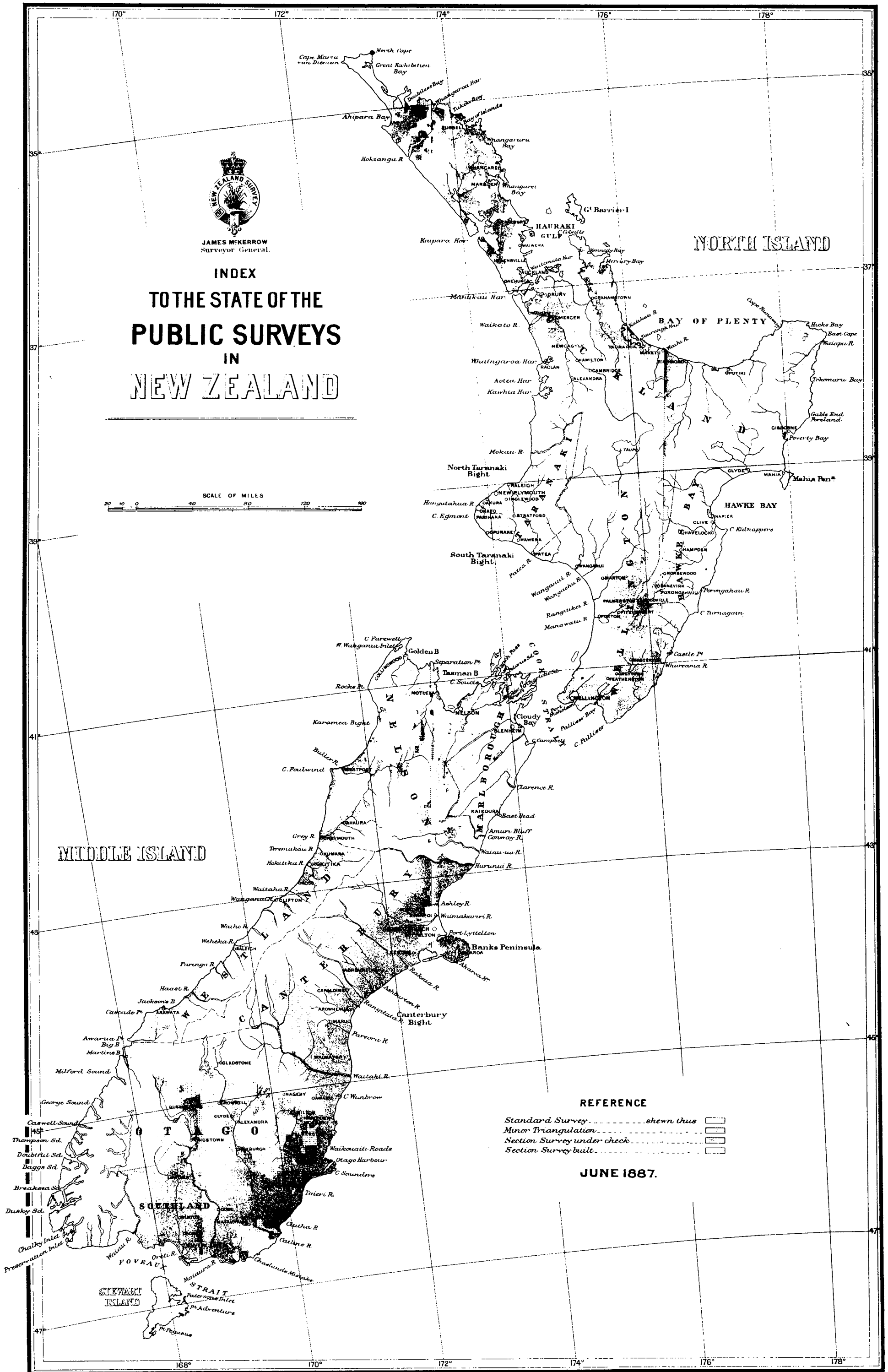
Sectional Surveys.—At the beginning of our survey year I anticipated that all arrears would be completed this season; but a great deal of work that I had not calculated upon had to be done,

* The Martin's Bay triangulation was executed in 1870, in connection with the settlement sectional survey, the only instruments available being the five-inch theodolite and the common chain.

INDEX
TO THE STATE OF THE
PUBLIC SURVEYS
IN
NEW ZEALAND



JAMES MCKERROW
Surveyor General.



REFERENCE
 Standard Survey shown thus [Symbol]
 Minor Triangulation [Symbol]
 Section Survey under check [Symbol]
 Section Survey built [Symbol]

JUNE 1887.

No. 8.—RETURN of FIELD-WORK executed by STAFF and CONTRACT SURVEYORS, from 1st July, 1886, to 30th June, 1887.

PROVINCIAL DISTRICT OF AUCKLAND.

Table with columns: Surveyor and District, Major Triangulation, Minor Triangulation, Topographical and Trigonometrical Survey, Rural and Suburban, Town Section Survey, Native Land Court Survey, Roads, Railways, and Water-races, Detention by Native Opposition or other Causes, Other Work, Total Cost of Surveyor and Party from 1st July, 1886, to 30th June, 1887, Remarks. Includes entries for G. W. Williams, J. O. Barnard, S. Westman, E. C. Goldsmith, L. Cussen, F. Simpson, J. Baber, F. H. Edgecumbe, R. Neumann, G. A. Martin, E. H. Hardy, J. I. Phillips, C. Stevens, C. W. McFarland, H. D. M. Haszard, W. J. Wheeler, M. C. Smith, H. D. McKellar, A. H. Vickerman, E. F. Adams, J. E. Pickett, W. Armstrong, and Means and totals.

PROVINCIAL DISTRICT OF HAWKE'S BAY.

Table with columns: Surveyor and District, Major Triangulation, Minor Triangulation, Topographical and Trigonometrical Survey, Rural and Suburban, Town Section Survey, Native Land Court Survey, Roads, Railways, and Water-races, Detention by Native Opposition or other Causes, Other Work, Total Cost of Surveyor and Party from 1st July, 1886, to 30th June, 1887, Remarks. Includes entries for Staff Surveyors (Walter Hallett, N. I. Tone, F. Rich, J. G. Wilson, G. Watson) and Contract Surveyors (W. Hallett, A. H. Ross, L. Lessong, C. D. Kennedy, J. Rochfort, H. K. Howell, T. J. Mountain) and Means and totals.

PROVINCIAL DISTRICT OF TARANAKI.

Table with columns: Surveyor and District, Major Triangulation, Minor Triangulation, Topographical and Trigonometrical Survey, Rural and Suburban, Town Section Survey, Native Land Court Survey, Roads, Railways, and Water-races, Detention by Native Opposition or other Causes, Other Work, Total Cost of Surveyor and Party from 1st July, 1886, to 30th June, 1887, Remarks. Includes entries for Staff Surveyors (A. O'Donohoo, W. H. Skinner, H. M. Skeet, H. M. Climie, A. C. Atkinson, P. A. Dalziel, T. L. Humphries) and Contract Surveyors (Messrs. Skinner and Sole) and Means and totals.

No. 8—continued.—RETURN of FIELD-WORK executed by STAFF and CONTRACT SURVEYORS from 1st July, 1886, to 30th June, 1887.

PROVINCIAL DISTRICT OF WESTLAND.

Table for PROVINCIAL DISTRICT OF WESTLAND. Columns include Surveyor and District, Major Triangulation, Minor Triangulation, Topographical and Trigonometrical Survey, Rural and Suburban, Town Section Survey, Native Land Court Survey, Gold-mining Survey, Roads, Railways, and Water-races, Other Work, Total Cost of Surveyor and Party, and Remarks.

PROVINCIAL DISTRICT OF CANTERBURY.

Table for PROVINCIAL DISTRICT OF CANTERBURY. Columns include Surveyor and District, Major Triangulation, Minor Triangulation, Topographical and Trigonometrical Survey, Rural and Suburban, Town Section Survey, Native Land Court Survey, Gold-mining Survey, Roads, Railways, and Water-races, Other Work, Total Cost of Surveyor and Party, and Remarks.

PROVINCIAL DISTRICT OF OTAGO.

Table for PROVINCIAL DISTRICT OF OTAGO. Columns include Surveyor and District, Major Triangulation, Minor Triangulation, Topographical and Trigonometrical Survey, Rural and Suburban, Town Section Survey, Native Land Court Survey, Gold-mining Survey, Roads, Railways, and Water-races, Other Work, Total Cost of Surveyor and Party, and Remarks.

* Resubdivision.

No. 8, *continued*.—RETURN of FIELD-WORK executed by STAFF and CONTRACT SURVEYORS, from 1st July, 1886, to 30th June, 1887.
PROVINCIAL DISTRICT OF SOUTHLAND.

Surveyor and District.	Rural and Suburban.			Roads, Railways, and Water-races.			Other Work.	Total Cost of Surveyor and Party from 1st July, 1886, to 30th June, 1887.	Remarks.	
	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Miles.	Cost per Mile.	Total Cost.			Cost.
<i>Staff.</i>										
John Hay. Forest Hill, East Winton, Winton, Invercargill, and New River	2,311	120	s. 6 4	£ s. d. 731 16 4	Miles. 2 13 7	£ s. d. 2 36 14	4	£ s. d. 60 0 0	£ s. d. 876 10 8	Surveys wholly in heavy bush. Expense increased by its having been cut over by saw-mills, and sections being of small area.
<i>Fee-system.</i>										
T. S. Miller. Winton, Taringatura, Campbelltown, and Invercargill	1,184	10	1/7-7	97 5 0	..	..	..	..	97 5 0	Saw-mill areas, with two exceptions. Saw-millers provided men for cutting lines.
John Hannah. Invercargill, Oteramika, Eyre, Campbelltown, New River, Paterson District, Stewart Island	1,030	8	1/9	90 5 0	..	..	..	..	90 5 0	Ditto.
R. C. Taylor. Jacob's River, Invercargill, and Longwood	446	4	1/11-1	43 0 0	..	..	..	..	43 0 0	Partly bush; two saw-mill areas; labour provided by sawmillers.
	4,971	142	3/10-4	962 6 4	2 18 17	2 36 14	4	60 0 0	1,107 0 8	
				Less refunds	..	..	..	..	230 10 0	
									876 10 8	

notably the subdivision of part of the Native reserves at Kaiapoi by Mr. Brodrick, and of the reserves at Raupaki and Port Levy by Mr. Welch. The subdivision of these reserves into so many small holdings, in accordance with the awards of the Native Land Court, took a considerable time, as a preliminary survey (for the information of that Court) had to be made to locate the houses, gardens, fences, and other improvements. 2,780 acres were subdivided into 118 allotments, ranging from 400 acres to a quarter of an acre, at a cost of 3s. 10d. per acre. A considerable number of reserves in various parts of the district, and part of the township lands in Dromore, Hinds, Orari, Arowhenua, Fairlie Creek, and Kurow, were subdivided into various-sized allotments for village-homestead special settlements situate in all parts of Canterbury, from the Hurunui in the north to the Waitaki in the south, making it necessary for the survey parties to shift ground a great deal, and thus perforce increasing the cost of the work. In addition to this, 500 sections, equal to 17,554 acres of ordinary sectional work, which includes 146 sections containing 4,562 acres of revision surveys, have been completed at a cost of 1s. 8d. per acre. Twenty-seven sections originally laid out in terms of the applications, but found to contain a greater area than the owners have paid or are willing to pay for, have had the excess acreages cut off, at a cost of £75, which will in due course be recouped to the department by the purchasers, in accordance with the Land Act. Educational reserves containing 4,558 acres have been subdivided into suitable-sized farms for the Education Commissioners of Canterbury.

Inspection of Surveys.—During the year the Inspector's time has been principally occupied in supervising the roadworks undertaken with public money by several of the County Councils and Road Boards to open out Crown lands. He has also visited the ground and reported upon ten claims under the Forest-Trees-Planting Encouragement Acts, upon thirty-two reserves in various parts of the district, and on eleven pastoral deferred-payment sections. Besides this outside work he was for some time occupied in making valuations of Crown lands for the Property-tax Commissioner, or of runs for the guidance of the Land Board; and he has passed as authorised surveyors five surveyors formerly holding licenses under the old Act, and has inspected in the field the work of two of the staff surveyors.

Land Transfer Surveys have been the same as during the previous years except in the number of transfers checked and plans on ordinary certificates of title, both of which show a falling-off as compared with last year. The number of deposit plans received was thirty-one, covering 412 divisions or parcels of land. Thirty plans of land taken for railway purposes were received from the Public Works Departments, and checked. Twenty-five plans of road deviations under the Public Works Act were checked and dealt with. One hundred and ninety-six applications to bring land under the Land Transfer Act, 329 ordinary transfers, 14 mortgages, 26 leases, and 5 other documents were referred to Mr. Monro for verification of description, area, &c. There have been 966 ordinary certificates in duplicate and 791 certificates in lieu of Crown grants, with duplicates and triplicates, prepared and passed on for issue. In all, some 3,514 plans have been put on the various title-forms under Mr. Monro's direction. Three subdivision-plans, on a scale of 5 chains to an inch, of the Lyttelton and west portion of Sydenham Boroughs and of the Town District of Sumner have been prepared by Mr. Cane during the year, and the current work of the office kept up to date.

Office-work.—Ninety-seven plans of sectional surveys, subdivisions of reserves, or townships for village-homestead special settlements, have been received from staff surveyors, of which there remain but fifty-one to be checked, including the plans sent in at the end of June last; so that this part of the office work may be considered well in hand. Three new Crown-grant record maps have been made, and the certificates of title issued during the year duly recorded. Twenty-four Crown grants and 789 certificates of title, embracing 1,222 sections containing 75,572 acres, have been prepared and issued to the Land Transfer Department.

In another year the arrears of Crown grants and certificates of title caused by the heavy land-sales of previous years should be nearly worked up, and the Crown titles to the Canterbury freeholds all issued, except perhaps a few of which resurveys will have to be made.

Mr. McCardell reports that six new survey district maps have been compiled, and three are in hand, and that there have been prepared six mounted tracings of district plans for the public map-room, eighteen plans of village-homestead settlements or subdivision of other lands, for photolithography, eight survey district plans; and the duplicates for the public office have been marked up with all recent surveys.

The map commenced last year, showing the latest topographical surveys for fifteen miles on each side of the proposed Midland Railway, has been completed; and a reduced plan of the topographical survey of Lake Ellesmere, on a scale of 40 chains to an inch, has been made from Mr. Hay's recent surveys; and, in addition, a great deal of miscellaneous work has been done.

Plans of Survey Districts.—I have been unable to keep the draughtsmen at this work, owing to the demand for lithographs of the numerous village-homestead settlements. I find that there are yet to be done forty lithographs of such survey districts as have a considerable area of purchased land within them, and that twenty-five new survey districts wait compilation; but before these can be proceeded with there are thirty mounted tracings to be prepared for the public map-room, and twenty-three for the Timaru District Office. Under this head there is yet, therefore, a large amount of work to be done, and, with a view to its reduction, I propose placing all the staff of draughtsmen, now much smaller in number, under the charge of Mr. Shanks, so that as the work in his branch lessens he may be able to go on with these arrears, and thus permit the district plans to be published.

Retrenchment.—I greatly regret that the decrease of work in this branch of the department and consequent reduction that the Government has made in the staff should have led to the retirement of Mr. Walter Kitson, for the last ten years and a half Inspector of Surveys, who not only loyally assisted me in inaugurating in this district the present New Zealand system of surveys, but helped me to overcome the very large accumulations of work resulting from the heavy land-sales. In addi-

tion Mr. Kitson was for eleven years and a half an employé of the Provincial Government, and for the whole of these twenty-two years his career shows a record of honourable service; and that the exigencies of the times have compelled his retirement is much felt, not only by the heads of the department, but also by his brother officers with whom he has served in this district. Through the same cause I have also to regret the loss of the services of Messrs. Anstey and Mather, skilful draughtsmen, who have done their work faithfully and intelligently for many years.

Proposed Operations, 1887-88.—The arrears of field-work of the sectional surveys are so well in hand that I shall be able to employ four of the surveyors to extend the triangulation and topographical surveys over that portion of Canterbury of which we have no topographical details other than the old surveys made by Messrs. Jollie, Whitcomb, Wilson, and Young, more than twenty-five years ago. It is absolutely necessary that this should be done twelve months before the expiration of the present pastoral leases in May, 1890, so that proper plans can be prepared, showing the position of the division-fences, and the actual extent of country over which the stock graze, which in many cases does not agree with the boundaries of the runs as shown by the licenses, and in some instances in the high mountainous country the sheep are mustered from places miles beyond the apparent boundaries of the runs.

I purpose to send one surveyor to triangulate the Waipara and Hurunui country back to Lake Sumner, one to complete the block between Mount Hutt and Lake Heron, taking in the upper waters of the Ashburton, and one to continue the triangulation up the Rangitata to connect with the triangulation of the fourth surveyor, who will commence work at the termination of the present triangulation on Lake Tekapo, and continue up the Godley and Macaulay Rivers, and the country lying between the last-named river and the Mesopotamia Run on the Rangitata. I think that these parties could commence work by the middle of September, or early in October, and continue it until the end of May. It will have to be pushed on as fast as practicable during the summer months, as it will be impossible, owing to the severity of the winter, to remain in the field beyond the end of May. They can come into the office for two months to complete the plans and calculations. By these means, I anticipate the completion in two seasons of the triangulation and topography of the rest of the Canterbury District. This would leave me one surveyor to go on with the current work, or the subdivision of any reserves or other lands which may have to be undertaken during the year.

JOHN H. BAKER, Chief Surveyor.

OTAGO.

THE strength of the field and office staff is nearly the same as it was at the date of my last report, being six staff surveyors and three cadets in the field, eleven draughtsmen and two cadets in the office, and two draughtsmen in the district offices.

Minor Triangulation.—I have been compelled to have parts of two districts triangulated this year in order to connect outlying surveys. Mr. Strauchon observed some triangles to connect a section near Nugget Lighthouse; and Mr. Wilmot had to extend the Glenomaru triangulation into Woodland District, so as to embrace the homestead block to the south of Catlin's River. The cost per acre of this triangulation includes carrying standard bearing from Mount Oamaru (near Romahapa) to Hinehine, south of Catlin's Lake, and is 2.77d.

Rural Section Surveys.—The amount under this heading is a little less than last year, being 35,752 acres, comprising 256 sections, at a cost of £3,205 5s. 10d., or 1s. 9½d. per acre.

Town Section Surveys.—Only forty-three town sections were laid off, comprising 82 acres, at a cost of £49 15s. 4d., or £1 3s. 2d. per allotment.

Mining Surveys.—Sixty sections, containing 1,499 acres, have been laid off this year, as against thirty-nine sections, containing 432 acres, last year. The cost per acre is 8s. 6d., as against 15s. 6d. last year.

Road Surveys.—These comprise eighteen miles, costing £161 10s. 11d., or £8 19s. 6d. per mile.

Village Settlements.—The survey of the village settlement in Block VII., Waikawa District (including the Village of Niagara), was completed some time ago. The area laid off is a little over six hundred acres, and the sections range from a quarter of an acre to forty-five acres in extent. The plans have been lithographed and handed over to the Crown Lands Office here.

Survey Inspections.—During the year, besides inspecting roadworks carried out under the counties, I visited the districts of Naseby, Gimmerburn, Waikawa, Woodlands, Glenomaru. The latter I visited on two occasions, and have gone over every road that has been laid off and graded by Messrs. Wilmot and McCurdie in the blocks now being surveyed by them. I also, with Mr. Colin Allan, Immigration Officer, inspected the village settlements in Molyneux and Glenomaru Districts, on which it is proposed to settle any of the unemployed who wish.

Examinations for Authorisation.—Only three cadets presented themselves—two belonging to this office and one from a private office. All passed successfully.

District Offices.—Of the three district offices, Lawrence is under the charge of Mr. McLean, Queenstown under Mr. Adair. Naseby, having no resident draughtsman, is under the charge of the District Surveyor, Mr. D. Barron.

Dunedin Office Work.—As directed by you Mr. W. I. Percival terminated his services in this department on the 31st of March last. Mr. W. F. Browne, after a protracted absence through illness, resumed duty in February. The work of the office made very satisfactory progress. It will be seen that Mr. Skey, the Chief Draughtsman, with the assistance of Messrs. Browne, Wadie, Marsh, and Stables, have, besides other incidental work, prepared and recorded 425 Crown grants and certificates of title, representing 33,825 acres; 116 perpetual leases, in triplicate; 52 pastoral leases, in duplicate; 80 deferred-payment licenses, 20 occupation licenses, 22 mining leases, 10 agricultural leases, 9 exchange leases, 10 special leases, all in duplicate; 65 village special-settlement leases and 17 small-grazing-run leases, both in triplicate. Mr. Wadie has also

recorded new surveys and alterations of boundaries on run maps, and examines all road-contract plans and specifications sent for my approval. Mr. Nicolson, the custodian of the safe, supplies the Land Office with copies of surveys executed, makes tracings of applications, &c., for surveyors, and attends to the general public. Mr. Fynmore recorded thirty-nine new and closed road-surveys on the working-plans, road district and county maps, reported on several road matters, and supplied the Education Board with descriptions of new school sites, &c. Mr. Thompson checked 123 staff surveyors' plans, 42 road plans in duplicate, and 12 agricultural and 58 mining leases in duplicate. The Accountant, Mr. Runcie, has, besides the ordinary correspondence and bookkeeping, recorded a *précis* of and indexed 3,286 letters sent and received, entered and numbered 262 plans, checked and tabulated the monthly survey and road reports, has charge of distribution of stores, pays salaries and wages, despatches plans, parcels, and correspondence, and attends to all matters in connection with the office.

Land Transfer Surveys.—Mr. Thompson has examined and checked 79 maps for deposit. Mr. Treseder examined and checked 73 applications, 871 transfers, 702 mortgages, 73 leases, 118 transmissions, 779 draft certificates, and put plans on 1,636 certificates of title, and attended to the general work as it occurred.

Lithographic Branch.—Mr. Percival reduced and drew six plans for photolithographing, and one on transfer-paper. Mr. Morrison reduced and drew twelve plans on transfer-paper, and one for photolithography. Mr. Ross photolithographed seven plans, and printed 6,200 copies, besides printing protractors, circulars, and a paper on long steel tapes. Mr. Bain mounted and repaired 395 maps, besides assisting Mr. Ross. According to directions received from your office Mr. Ross was transferred to Wellington. Mr. Bain's long connection with the work here will enable him to undertake any small jobs of printing that we may have occasion to require.

Proposed Operations.—In connection with the triangulation executed by Mr. Strauchon last season, it will be necessary to measure a base-line. The measurement of this base will not take long, as Mr. Strauchon has already selected the site, but was prevented by the winter season from going on with the measurement. There are two other triangulations that should be undertaken next season—viz., the extension of the triangulation of Catlin's and Woodland Districts westward, and the extension of Waikawa and Mokoreta eastward. Base-lines should not be required for either of these triangulations, but in view of the extension of settlement along the track connecting Waikawa with Catlin's River it is very desirable that the triangulation should be kept a little in advance of the section surveys. In the Dunedin office I hope to get the arrears reduced during the ensuing season. There is still a great deal of work to be done in compiling working plans, and renewing Land Office and Crown-grant record maps. I shall also endeavour to have some more of the district drawn for lithographing on the 80-chain scale. I find these maps exceedingly useful, superseding for most purposes those drawn on the 20-chain scale.

C. W. ADAMS, Chief Surveyor.

SOUTHLAND.

Field-work.—The field-work during the year has been confined to those surveys that come under the head of "Rural and Suburban." There have been surveyed during the year 142 sections, covering 4,971 acres, these sections having been almost entirely in bush. Of these 142 sections, fifteen were saw-mill areas, six were purchases, one was a mineral area, and the remainder were for the most part bush sections that were laid off for disposal either as cash, deferred-payment, or village-homestead special-settlement lands. The saw-mill areas were more numerous than usual, owing to the incoming of the State Forest regulations, and to the obligation which was laid upon saw-millers of working within definitely-marked areas for which they had previously secured titles. In this connection I may say that the change of system was made as easy as possible, and, though two or three of the saw-millers have been put to some inconvenience, I find that the majority are rather glad of the change, as affording a security and a definiteness of tenure which the system previously in vogue was unable to give. As already stated, the great majority of the sections laid off during the year were in bush. This has necessarily largely increased the cost of survey. A large number of the sections were in Seaward Bush, at little more than suburban distance from Invercargill. These were laid off to meet the possible requirements of settlers, the system of tenure proposed by the Government being chiefly the village-homestead special-settlement system. As will be seen, the staff has been very small during the year, the block surveys in anticipation of settlement having been made by Mr. Hay; the surveys of saw-mill areas, purchases, &c., having been made by private surveyors, who were paid the fees deposited by applicants. The demand for land has been exceptionally flat during the year, money being scarce, and the district having shared in the effects of the general depression.

Office-work, &c.—During the year thirty plans have been examined and passed for the Land Transfer Office. These embraced in whole or in part 163 original sections, redivided into 156 allotments, containing some 8,250 acres. There were 389 certificates of title, involving 778 plans, prepared. In addition to these there were prepared 253 certificates of title in lieu of Crown grants, involving 759 plans. Sixty-five perpetual leases in duplicate, involving 130 plans, were also executed. In connection with the Land Transfer branch, 45 applications and 133 leases were examined and passed. Nineteen Land Transfer record maps were also prepared. In connection with the Crown Grant Office, nine record maps were prepared during the year. Four lithographic drawings were prepared and printed locally. Besides these, several large and elaborate drawings of districts, showing sectional surveys on a scale of mile to inch, were prepared and forwarded to Wellington for photolithographic purposes. These, I think it will be admitted, reflect credit on Mr. Deverell, whose merits as a draughtsman you have recognised by his transfer to Wellington. I regret the loss to this office of Mr. Deverell's services, but on the score of economy willingly acquiesced in the

change. Nearly all the districts have now been lithographed, and it is unnecessary to remind you of the advantage these maps are to both the public and the department. It would be difficult—and I presume it is undesirable—for me to particularise the various details of routine work that have been executed by the office. There is little further to add, except that I am glad to report that the officers under me have been most obliging and assiduous in the discharge of their duty, and it has been a pleasure to work with them.

J. SPENCE, Chief Surveyor.

APPENDIX No. 2.

RECONNAISSANCE SURVEY OF THE CLARKE AND LANDSBOROUGH COUNTRY, WESTLAND.

I ENTERED upon the exploration of this, the last extensive stretch of unknown country within Westland, in January last.

Leaving the sea-coast on the 24th of that month I travelled up the Haast to Camp No. 1 (see map accompanying report), on south side of Clarke River; thence ascended and followed the range between the Clarke and Landsborough to abreast Mount Hooker, when stress of weather forced me to descend and seek shelter in the timber skirting Marks's Flat. The storm which raged during the three days following, the thunder and lightning, and the terrific gusts of hail and rain which continued without intermission from the evening of the 4th to the morning of the 6th February, were something to be remembered. The heaviest flood in the Haast River, as we afterwards learned, took place on the morning of the 7th February. It was then, according to Mr. Marks, who has uninterruptedly lived at the mouth of the Haast for nearly eighteen years, fully eighteen inches higher than on any previous occasion.

After rough-traversing the Clarke River down to Munro's Flat I mounted the range again, and ran it out to the pass leading into the Otolua, which is the largest branch of the Paringa River. That done, I descended into the Landsborough Valley (Camp No. 6), and thence followed up the western bank of the Landsborough to its source. We returned by following down the Landsborough to its junction with the Clarke, and thence up again to Camp No. 1, and, after completing the traverse from that camp to Munro's Flat, left for the sea-coast, the mouth of the Haast, reaching there on the 26th February.

This exploration has been the most difficult of those I have undertaken on the West Coast; the dangers connected therewith have been great and many.

The mountain-range between the Clarke and Landsborough from point B to the Otoka Pass is loose stuff, and slipping away at a tremendous rate. Between traverse-points 41 and 44, for instance, the slips meet, dropping at angles of 50° and over for 1,000ft. or so, terminating at precipices, and it requires remarkably steady nerves to carry a load along these sharp razorbacks. But the crowning piece of this particular style of country we met at "Break-neck Point," about half a mile east of Solution Point, where the Clarke and Landsborough slips must have met many, many years ago, and must have continued slipping ever since, leaving the sharp razorback ridge fully 30ft. below the undisturbed surface of the adjoining ground. To makes matters worse there were large stones sticking out of the perpendicular face of rotten stuff, which might at any time come down upon whoever descends by the rope.

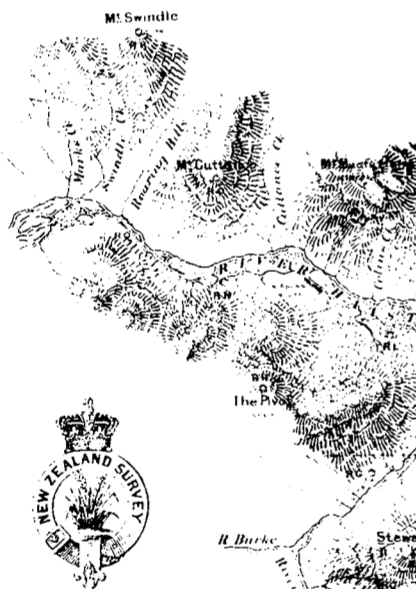
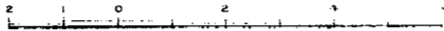
I could not possibly have found a more favourable mountain-range from whence to fix the principal features of the country than the one I was on, and I therefore felt very loth to abandon the idea of running it out to abreast Mount Hooker at all events, and I therefore gladly accepted—though, I admit, with a certain amount of fear and trembling—the offer of Charles Douglas, an experienced and able bushman and cool-headed climber, who accompanied me on many of my former explorations, to be let down by the rope and clear away the dangerous projecting stones, cross the razorback of over a mile in length, and see whether it was practicable at the other end to get off it on to the grass lands again. He did this, reported favourably, and then men, swags, and dogs were lowered by the rope, and the trip across was safely accomplished, rather more than half of it, however, "on all fours," for there were many surface slopes so steep, and the drops at the end of them so ominous-looking, as to make all of us feel that it was too much of a risk to attempt to walk erect. About two hours after we got across this dangerous place the terrible thunderstorm to which I have already referred, and which drove us down to Marks's Flat, commenced.

The Landsborough is a remarkable river, and unique in its character. Following any of the other Westland rivers the glaciers at the head of them are struck at comparatively low altitudes, and generally well within the bush-line. As a rule, the hill-slopes around the glaciers are clothed with bush to a height of from 1,000ft. to 2,000ft.; and whenever it is found that glaciers at their sources are situated above the bush-line, then invariably the waters descend from them in leaps and bounds by waterfalls often hundreds of feet in height. The Landsborough is the only river that rises from an immense glacier about 1,000ft. above the bush-line, and has not a single waterfall in its whole course. From its head to within a mile of its junction with the Clarke it is a boiling, turbulent, mountain-torrent, fordable, I believe, at two or three places; but then only in the middle of winter, when the snow and ice are fast bound in the ranges. Even some of the small insignificant-looking creeks running into the Landsborough proved to be too formidable for fording, and we had to devise some other means of getting past them. The creeks coming from Strachan Glacier and the Fettes Glacier are foaming torrents, and we had to run them out and cross on the glaciers. Sapling Creek we had to bridge; and at Zara Creek, which comes tearing down through a rock-bound gorge with perpendicular walls several hundred feet high, a large boulder-rock lying in the centre enabled us to bridge it in two spans. But for that rock, probably I should not have been able to reach the head of the Landsborough. On the map are two fords marked—one near Camp

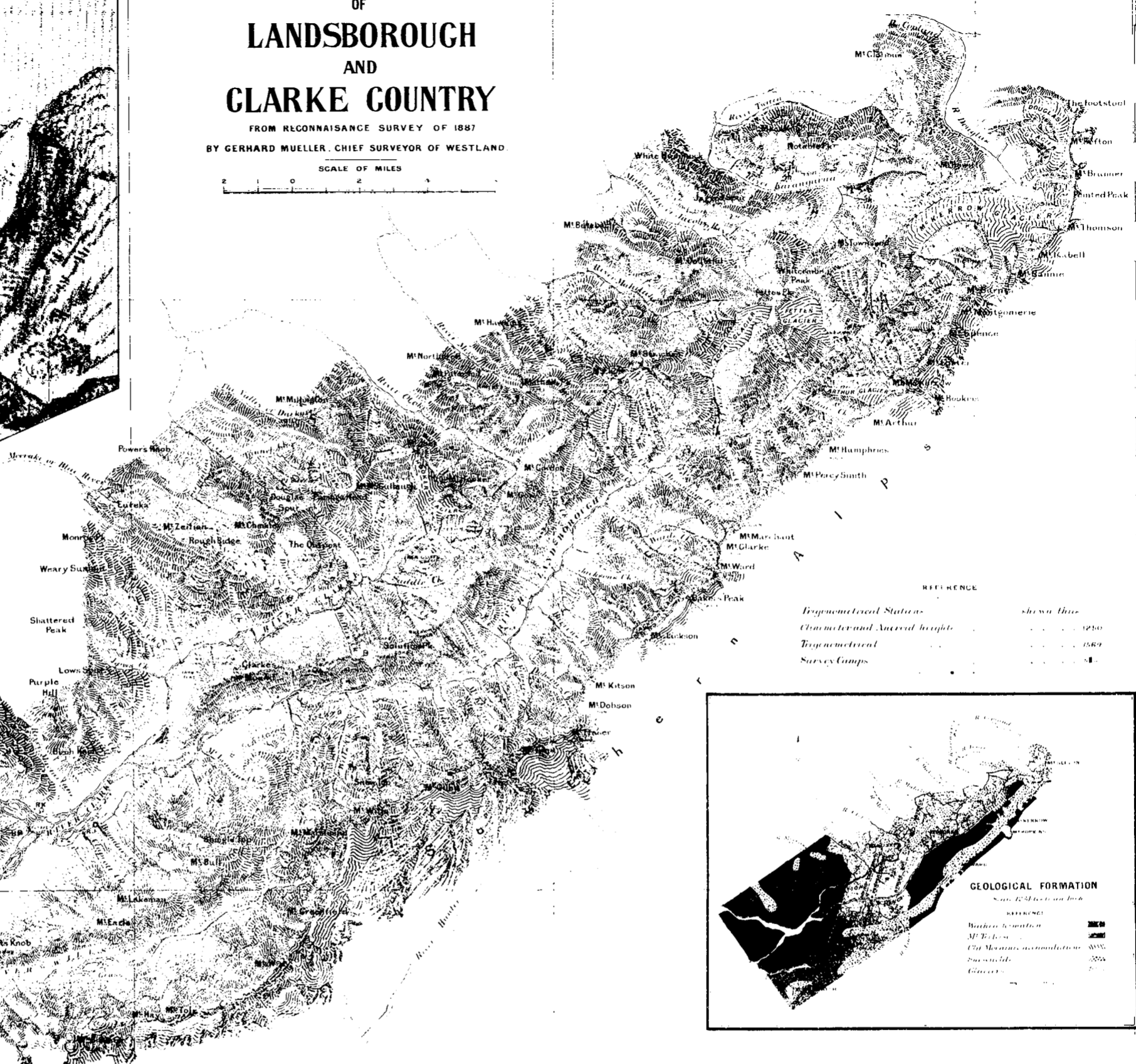
TOPOGRAPHICAL PLAN OF LANDSBOROUGH AND CLARKE COUNTRY

FROM RECONNAISSANCE SURVEY OF 1887
BY GERHARD MUELLER, CHIEF SURVEYOR OF WESTLAND.

SCALE OF MILES

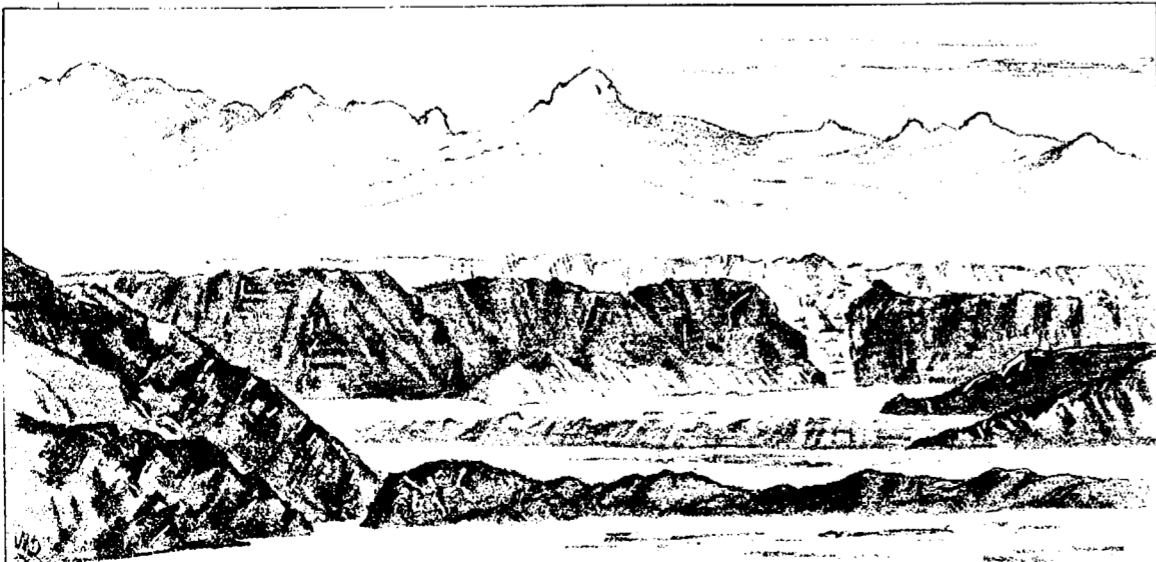
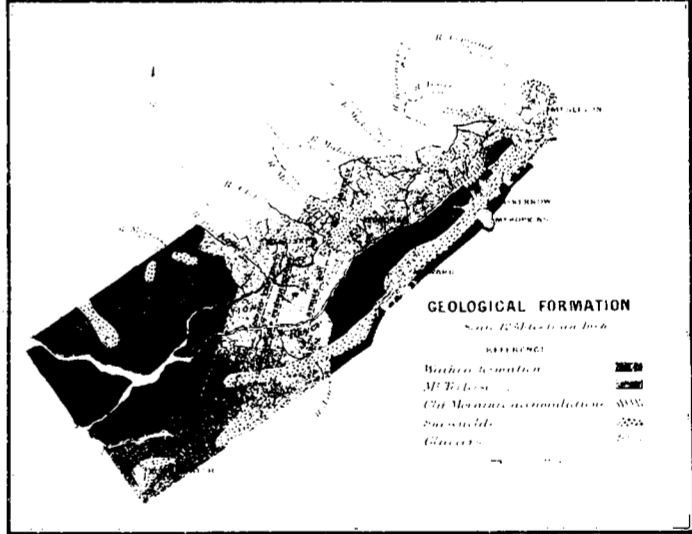


NEW ZEALAND SURVEY
JAMES M'KERRON
Surveyor General
Drawn by H. M. Gault, H. Hills, & W. D. S. O'Connell



REFERENCE

<i>Trigonometrical Stations</i>	shown thus
<i>Contours and Ascertained heights</i>	..... 1880
<i>Trigonometrical Survey Camps</i>	..... 1889



The Tongariro Station, from a sketch by Geo. Douglas



The mountains of the Westland Survey, from a sketch by Geo. Douglas

No. 10 and the other between Adams's and Wills's Creeks. They looked well, and I have no doubt are practicable during the winter months; but it was impossible to make use of them when I was there.

Even close to the foot of the glacier, where there are usually (at other glaciers) some shallow bars formed by the moraine brought down by them, there was not the slightest chance of crossing the river, and the observation-points I and H had to be reached by crossing McKerrow Glacier. The water of the Landsborough is always dirty and muddy, and, excepting in the very depth of winter, the bottom of the river is never visible; the ranges on both sides of it, and especially the dividing range are disintegrating and crumbling down at a very rapid rate. The falls of avalanches and the slips, especially near the head of the river, are incessant. The whole of the dividing range slopes, from Mount Burns at the head down to Mount Marshman, are one mass of deep cuts caused by slips and avalanches; and from point D abreast Otoka Pass, from whence I had a splendid view of the whole of the dividing range, I could see only one fairly good spur for ascending the dividing range, and that the one leading from abreast the ford near Camp No. 10 to Mount Kitson. The other spurs, without exception, are shattered and broken, and difficult to climb.

Travelling along the Landsborough is also made difficult by the many high gravel-terraces and rocky bluffs on both sides of it. Into the former the river has in many instances cut so deep as to make it dangerous to pass underneath the perpendicular and sometimes overhanging walls; and to climb over the latter, covered invariably with thick scrub and prickly creepers, is downright hard work. A fair idea may be got of what travelling in that description of country means by my stating that the result of one day's steady travelling (I admit this was one of the worst days we had), from 6 a.m. to 5.30 p.m., amounted to only four miles' progress on our journey.

As regards the survey work, the map, I think, is almost sufficiently explanatory. The whole of the Clarke River and the Landsborough River and mountain-range between these have been rough-traversed—*i.e.*, bearings taken with prismatic compass, and distances stepped or estimated, as the formation of ground would admit. Most of the points at which observations were taken are held by shots to mountain-peaks fixed by triangulation some years ago by Mr. Roberts. Of these points there are no less than nineteen, and every one of them is connected with one or the other of the traverses. The traverses themselves were made to swing in between these fixed points, and may therefore be relied on as fairly correct.

The land fit for settlement in the Landsborough Valley does not amount to more than five thousand acres all told, and the greater part of that will not be available until a few miles of road leading into it are constructed. In the Clarke Valley there are some very nice flats along the foot of the range, which will be settled upon before many years are over. One section (see map) has been purchased already.

For pastoral purposes the grass-flats in both the river valleys are very good; but most of these in the Landsborough are not available until tracks are cut—in fact, until bridle-tracks have been constructed by which cattle or horses can reach them.

The fine grass on the flats in the Clarke Valley will, I fear, disappear before long if something is not done to exterminate the rabbits which are flourishing on one of the finest of these flats. The appearance of rabbits there led to the supposition that they came across the Hunter Saddle and down the Landsborough; but there are no rabbits to be found in the Landsborough Valley, and the nature of the country prohibits the idea of their having come across by the Hunter Saddle, 5,529ft. high, or, indeed, anywhere across the dividing range, into the Landsborough. Nor can they have come down the Haast, for none are found on the many fine grass-flats between the Clarke and the foot of Haast Pass. The only explanation therefore is that some enterprising rabbitier has carefully brought over a pair from the Wanaka country and set them adrift on the Clarke Flat, where they can develop unmolested by man or dog.

The bush pasture in the Clarke and Landsborough Valleys is of the ordinary kind; in the Clarke it is rather better than in the Landsborough. As to hill pasture, I have also little good to report. Where there is good grass on the hill-tops it is so difficult of access that it may be looked upon as practically useless.

The timber in the lower reaches of these rivers is the ordinary mixture of pines and birches, with a few totaras, &c. Higher up the rivers it is birch (*Fagus solandri*) exclusively.

The geological formation I have shown on the small reference-plan on the map accompanying this report. In Professor von Haast's "Geology of the Provinces of Canterbury and Westland" I notice the Torlesse formation of the Hunter River Valley and the Hooker Range is broken by the Clarke and Landsborough country. This is not so. The Torlesse formation extends right across without a break, as shown on the reference-plan. Gold in small quantities has been found along both banks of the Landsborough from its junction with the Clarke up to Wilson's Creek. In several of the creeks running into the Clarke also have traces of it been obtained; but up to the present none of the ground in or near either of these rivers has been proved payable. Of other minerals both the Landsborough and Clarke Valleys, and the ranges adjoining, seem to be entirely destitute; I have myself not seen the slightest indication of any.

In conclusion, I may draw attention to the fact that the Landsborough branch, thirty-seven miles in length, brings the total length of the Haast River up to sixty-nine miles, and thus secures to that river the first place on the list of our Westland streams. Its course is most remarkable too, inasmuch as it runs parallel to the sea-coast for its entire length, cutting off from the dividing range four of our largest navigable rivers—namely, the Karangarua, the Makawiho, the Mahitahi, and the Paringa.

GERHARD MUELLER, Chief Surveyor.

APPENDIX No. 3.

ROADS TO OPEN CROWN LANDS FOR SALE.

EXTRACTS FROM REPORTS AND STATEMENTS BY SUPERVISING OFFICERS ON THE WORK DONE FROM
1ST JULY, 1886, TO 30TH JUNE, 1887.

AUCKLAND.

Okaihau to Victoria Valley.—At the date of last report there were twenty-two and a quarter miles of this road open, partly as a cart-road, partly as a bridle-road. During the season a bridge has been built over the Mangamuka River, and recently work was again started to continue the road towards Victoria, a length of half a mile having been formed as a bridle-road, whilst a mile and a half are under contract by Maoris. As the line will now run for some miles through Maori territory, the work will be put into their hands so as to avoid complications. The work will shortly effect a junction with the track made by the Mangonui County from Oruru Valley, and thus afford a readier means of access between Hokianga and Mangonui. The area of Crown land directly affected by this road is not great (about 7,200 acres), but indirectly it will open a much larger extent of Crown and private property. Mr. G. G. Menzies, under Mr. E. Fairburn's supervision, has direct charge of the works.

Kohukohu to Rakautapu.—This work has been in charge of the Hokianga County. The whole length of five miles and a half is now completed. It runs through the Kohukohu Village Settlement, and ends at the Herd's Point-Takahue Road. Only about 387 acres of Crown land are directly affected by it; but indirectly it affords means of access to a large extent of Crown lands at Manganuiowae. The county has also constructed a wharf where the road terminates at Kohukohu.

Lower Waihou.—This road, which was laid out previously to last year's report especially to give access to the Native school from the Waihou settlements, Hokianga, will, when continued, lead to an extensive area of Crown lands. During the year a length of two miles and a half has been made as a bridle-road by Maori contractors.

Wairua to Helena Bay.—In connection with this line, an exchange has been effected of a piece of land at its termination at Mimiwhangata, to serve as a landing-place, and possibly a village in the future. Some few repairs have also been made where slips had occurred.

The Mimiha Branch of the above road leads directly to the homestead settlement of that name, and runs most of the way through Crown lands, but partly through the property of Mr. John Williams, who has dedicated the road to the Crown. A length of three miles and a quarter of bridle-road 8ft. to 12ft. wide has been made very cheaply, the work having been let to local settlers at piecework rates. A 30ft. bridge, now nearly finished, will complete the road. Mr. E. J. Fairburn has been in charge of the work.

Whangarei through Takeke.—This forms part of a road commenced three years ago, which, starting from the Ngunguru Road, runs through Crown lands and joins that now forming at Parua Bay. It was started this year near Pataua, in order to give access to the village settlement there. One mile and ten chains have been made to date by the village settlers—of from 6ft. to 12ft. wide—where it runs through their settlement and through a Native reserve. Mr. E. J. Fairburn has had charge of the work.

Mangapai to Mareretu.—This line was started at the southern end, where it branches from the Paparua-Waikiekie Road. It runs through a homestead settlement, affording the settlers a much-needed outlet, and will eventually lead on through Crown and private properties to a district much in need of opening up. During the year three miles and a half of 6ft. bridle-road has been made, and, in addition, contracts are let for another mile and for four bridges. Mr. Russell, under Mr. E. Fairburn's supervision, has had charge of the works.

Paparua to Waikiekie.—One and a quarter miles of this road and 93ft. of bridging have been made. It is on the same line as that mentioned above, but its further extension will be on a branch through some Crown lands of good quality, containing about 12,800 acres, part of which has been prepared for settlement. This is a line which should be continued in the spring, as it affords access to good land. Mr. E. Fairburn has been in charge.

Tatarariki Drain.—The Hobson County Council has supervised the construction of 60 chains of drain through Crown land, which will eventually be affected to the extent of about six or eight hundred acres. Assistant Surveyor Hardy speaks of the swamp in high terms. It has been laid out in farms for settlement.

Hunua Roads.—Nothing on this line has been done beyond ascertaining that a good line can be obtained through private property into a large extent of Crown lands now lying idle, but which it is proposed directly to prepare for settlement. A question of compensation has hitherto delayed the work.

Awaroa Swamp, Whiriwhiri, and Deeds.—These three votes all refer to the same place. Under the supervision of the Waipipi Road Board Inspector, Mr. J. T. Mellsopp, the drains cut last year have been deepened and improved, and fresh material thrown on to the road, and a contract is now in operation for a bridge, and extension of the road to dry land on the south side. An experiment has been made in sowing the swamp with mixed grasses, which has turned out a great success. The grass is doing very well.

Akaaka Swamp.—The contract in force at date of last report for a mile and a half of drain through this swamp has been completed, and a branch drain deepened and otherwise improved by Mr. Mellsopp, acting for the Waiuku Road Board.

Churchill Punt.—This work has been completed under Mr. Fairburn's supervision and design, and the punt handed over to the Waikato County Council.

Wairangi (should be Waerenga) Road.—Nothing further has been done on this road, beyond ascertaining that an excellent road may be obtained up a valley leading into an extensive area of Crown land of fair quality, which is now under survey for settlement. It is hoped that the vote for this road can be made available at once, as there are several people waiting to take up the land.

Hamilton to Whatawhata Swamp.—The Waipa County Engineer, Mr. Armstrong, has expended part of this vote in improving the drainage system in connection with the above road, and has also formed drains for draining the swamp itself. The money allowed by Government has been largely supplemented by county funds. The work done so far appears to have been beneficial, but further expenditure would be necessary to render the land available for culture.

Waingaro to Akatea.—This work was commenced in December last specially to afford access to the village settlements of Firewood Creek and Akatea. It has been formed for five miles and a half as a bridle-road by the village settlers under piecework contracts, and thirty-six rough bridges and culverts have been built. It will eventually form an important link in the communication between the West Coast and the railway-line, whilst at the same time opening out a large extent of fair but broken country. Mr. F. H. Edgecumbe has had charge of the works whilst laying out the village settlements.

Whaingaroa to Kahuru.—This line is an extension of that from Huntly to Whaingaroa, and was in hand at date of last report. During the year one mile has been added to its length, and 178ft. of bridging has been done, besides a large amount of fillings and corduroying. It is a bridle-road. It leads directly past the Hot Springs, which have been reserved and placed in the hands of the Waitetuna Road Board, which body has, I believe, made arrangements for utilising them by building an accommodation-house, &c. The previously-mentioned road will junction with this one not far from the springs. Mr. Grut, under Mr. Fairburn's supervision, has been in charge.

Whaingaroa to Waitetuna.—This road is merely the southern end of that mentioned above. A length of five miles of 6ft. bridle-road has been made, with 324ft. of bridging, and the money in hand will allow of its being extended to a junction with the Raglan-Whatawhata coach-road, thus opening up a main line of communication through from Huntly, which would be much used if a punt were placed at the crossing of the Waikato River. These two last roads, taken in conjunction with the extension to Huntly, open up a very large tract of fair country, which will doubtless be occupied within the next few years. Mr. Grut has this in charge also.

Aotea to Kawhia.—The Karioi Road Board has repaired and improved part of this road, and Mr. Fairburn has made a survey of a deviation of considerable length, ready for forming as soon as the Road Board secure the title. This road is also practically a continuation of the two previously-mentioned roads, with a space of some miles of old road between.

Kawhia to Waipa.—No new works have been done on this road in extending its length, as it was finished the previous year; but a double-punt has been placed at the Oparau crossing, and a smaller one at Puti; and extra bridges and constant repairs have been made through the year. A man is now constantly engaged in looking after this line, keeping open the water-tables, removing slips, &c.

Alexandra to Hikurangi.—This road, which is really an extension of the above, has been completed by making half a mile of road and building 116ft. of bridges, and fencing 60 chains where it ran through cultivations. By means of these two roads it is possible now to drive from Alexandra to Kawhia along fine easy grades everywhere, though of course in winter-time the road is bad. Mr. Fairburn has had charge of both the above roads.

Cabbage Bay to Cape Colville.—This road has been solely in charge of the Coromandel County. The Chairman informs me that about three miles of bridle-road have been made, of from 4ft. to 6ft. wide, with bush felled 1 chain wide.

Puriri to Tairua.—Five miles and a half of this line have been surveyed—that is, from Puriri up to the top of the dividing range—and seven contracts are in force, covering about three miles and a half. The line runs through a difficult country, and will be expensive to make, though the contracts are taken very cheaply. It is of the usual bridle-road character, and when completed will prove a great boon to the miners and others at the Tairua Goldfield, whilst it at the same time opens out some fair bush-land. Mr. A. B. Wright is in charge.

Waihou Ferry Road.—This road was about finished at the date of last report. The Ohinemuri County had the immediate supervision of the work. It is about a mile and three-quarters long, and affords access to the Thames River from the county road, and incidentally to Crown lands on the opposite bank.

Te Aroha Drains.—The only work done by this department has been the taking of levels for drains in connection with the village settlement formed there. Until funds are available no further steps can be taken.

Rotorua to Rotoiti.—This line, which is the commencement of an important road ultimately to connect Rotorua with Whakatane, and bring that place and Opotiki in connection with the railway terminus at Rotorua, was started in July last with a view of giving employment to Maoris whose cultivations had been destroyed by the eruption; but, owing to the absurd ideas that they (the Maoris) had as to the payments they should receive, only 11 chains have been formed, though five miles were graded ready for contract. The whole of the country is covered with an average depth of 9in. of volcanic mud.

Rotorua to Wairoa.—This well-known coach-road, which had been almost destroyed by the eruption, was taken in hand in December last, and again opened out in the interests of the tourists, and made available for buggy traffic. It was very largely used for three or four months by visitors who came to see the destruction wrought by the eruption; but has since become closed again owing to the thick covering of volcanic mud having brought down heavy slips, and it will not be available until the spring.

Rotorua to Galatea.—At the date of last report operations on this line had been stopped by the eruption of Tarawera, as its then proposed course passed through the country most seriously affected by the ejected matter. A great necessity having arisen to find employment for the Tuhourangi Tribe, whose home at the Wairoa Village had been completely destroyed, a start was made in a new direction, which, by keeping just outside the limit of the volcanic deposit, allows of a fine road to be made leading towards Galatea, but more immediately to the head of the Waiotapu Valley and Kakaramea—places which, now that the terraces have been destroyed, will prove a great attraction to visitors from all parts of the colony and from beyond the seas. Up to the present time fifteen miles of coach-road have been completed, and eight more graded ready for contract, and this fifteen miles will be available for carriages as soon as a few culverts are finished. This allows of driving as far as the little lakes at the head of Waiotapu. The work was let in forty-three contracts to the indigent Maoris, and the bridge- and culvert-work to Europeans.

Rotorua to Paeroa.—This line, which is a branch from the above, has been explored its whole length to a junction with that next to be mentioned, and is found to be of very easy construction, excepting a large bridge over the Waikato River. It is proposed to take this road down the Waiotapu Valley right through the vast number of hot springs, fumaroles, terraces, and other natural wonders, and, by joining it into the Huka Falls Road, form a continuous line from Taupo to Rotorua, which will pass through a country of unequalled attraction to the traveller. No works have been done on this part at present. Mr. J. C. Blythe has had charge of the works and surveys on the above four roads.

Galatea to Te Kapu.—No further work has been done on this line beyond some small repairs.

Huka Falls Road.—This line, which starts from the Township of Taupo, follows down the valley of the Waikato past the Huka Falls, and on to Wairakei. From that place one branch leads on to the present coach-road from Lichfield to Taupo, by which means several steep hills on the old road are avoided, and traffic will be brought through an interesting country full of hot springs, geysers, and picturesque falls. It is proposed that another branch, leaving it at Wairakei, shall pass over an easy country, and join into the Paeroa route mentioned above. Up to date nearly four miles of coach-road has been formed, and a little over one mile is under construction, which, when finished, will bring it to Wairakei. It is also proposed to place a foot-bridge over the Huka Falls to give access to the east side of the river. The Maoris have been constructing the road under the direction of Mr. J. Howard Jackson.

Taupo to West Coast, Waimarino Branch.—The portions of this road which had been formed previously to last year's report, extending from Taupo Township to Tokaanu, and thence onward by the Poutu Valley and Rotoaira to Otuku, have been kept in repair, and an additional length of two miles and a half added in the direction of Waimarino. Owing to the Maoris having been engaged at the Native Land Court, we were not able to push this work on so rapidly as in the previous year; but eight miles and a half are under contract, and this will be pushed on in the spring, and will probably effect a junction with the Central Trunk Railway-line, and thus open up a route of great attraction to visitors, besides rendering access to the considerable amount of Crown land in that neighbourhood a matter of comparative ease. When the Trunk Railway is opened from Marton to Waimarino this road (now open for fifty-nine and a quarter miles) will be largely used, as it passes all its length through a very attractive country. Taken as part of a main trunk road in connection with that now forming past the Huka Falls, and the proposed route *via* Waiotapu to the Rotorua-Galatea Road, it opens out all the sights most worth seeing in the way of thermal springs, and will thus tend in some measure to compensate for the loss of the terraces of Rotomahana.

Field's Track Branch of the West Coast Road.—This road, running from Murimotu to the Mangawhero River, near Wanganui, has been kept in such repair as the nature of the country allowed of, and a bridge has been built over the dangerous crossing at Mangawherowhero Stream. About three miles of bush-felling 2 chains wide has also been done, to let in the sun and air. The road will remain almost impassable in winter until the bush is cleared from end to end. It passes through a country which, though very broken, will make excellent small runs in the future, the soil everywhere being rich. It would be much to the interest of the travelling public if a little money were spent in improving the river-crossings between Murimotu and the point where this road branches from that mentioned above. Nothing whatever has been done here at present, and the track is dangerous in places. Both these roads are under charge of Mr. Jackson, who took them over from Mr. Wright in January last.

Tologa to Arakihī.—The ten miles of 10ft. road reported as nearly finished at the date of last year's report has been completed, and sixteen bridges built; the works have been carried out under the direction of the Cook County Engineer. At the end of the ten miles formed a road-party has been started to make a further length of five miles and a half as a bridle-track. Up to date a mile and a half of it have been finished, and the rest explored and partly graded to a junction with the Ormond-Waiapu Road. The work will, however, be delayed during the winter.

Opotiki to Ormond.—Mr. Barnard reports that from seven miles to the north of Motu Bridge to Poututu the whole road has been put in repair, the Motu Bridge re-decked, and all other bridges made good, so that the road is now in fair condition; but in that rough country it will not long remain so. The men engaged on the work have had great hardships to undergo, owing to flooded rivers and difficulties in getting up stores.

On the Opotiki side of the range two parties of surfacemen, under the supervision of Mr. Sidney Crapp, were employed in keeping the track in repair; and a further party of six men are at present employed under his oversight in widening it to 8ft., and clearing off the growth of scrub.

Gisborne to Waiapu.—The Cook County Engineer has built a new bridge in place of that which had been destroyed by fire. No work in extending this road has been done during the year.

Gisborne to Wairoa.—On this line the county has built some stone culverts, metalled approaches to bridges, and generally improved the road.

I am indebted to Mr. Warren, County Clerk, for particulars as to the three roads above on which the county has expended Government grants under the general advice of the department through Mr. Barnard.

VILLAGE SETTLEMENT ROADS.

In addition to the roads enumerated above, constructed under specific votes of Parliament, the Government granted sums to be expended in rendering access to the various village settlements, and to provide some employment to the most necessitous of the settlers. A large amount of work has been done in this way; but as the work is still proceeding, and is of a more desultory character than on the class of roads already referred to, complete details as to lengths, &c., formed, cannot be given. These works were of absolute necessity to enable the settlers to get on to their lands at once. Treating them in their geographical order, they are as follow:—

Ahipara to Herekino.—The Herekino Village Settlement is situated in the most inaccessible part of the northern peninsula; and therefore, to provide a means of access to it from existing roads, the above line was started in April by Mr. Wheeler, who graded eleven miles, prepared specifications for seventeen contracts, and let them to the Maori owners of the soil over which the road runs, all within the short space of ten weeks. Up to date no part has actually been completed and open for traffic; but about three miles of clearing has been done, and a start made on most of the contracts. The road is on good grades, and will be available for carts when completed.

Herekino Roads.—The greater part of this settlement is bush, with no means of access to the various sections except by the survey lines, which, having been cut nine years ago, were generally grown up and only to be found by the surveyors, and therefore unavailable for traffic by the settlers in conveying their goods to their various sections. To meet the difficulty, the settlers were set to cutting tracks along the road-lines and sometimes along deviations from them, the men being employed at day wages. As soon, however, as a way had been provided to each section, the work on the permanent-grade lines was started, and is now being carried on by piecework as in all the other settlements. Up to date not much has been done under the piecework system, four contracts only being in operation, as the overseer has instructions not to encourage the settlers to seek for employment on the roads where it withdraws them from clearing their lands. A very large amount of work will have to be done to make roads through the settlement, and to provide a road to the Whangape Harbour, by which route stores are at present conveyed to the settlers by the monthly steamer. Mr. R. McLeod has charge of the works in this district, under Mr. E. Fairburn's occasional supervision.

Takahue Roads.—Up to date two miles and a quarter of road of various widths and 117ft. of culverting have been done, besides some temporary tracks cut by Mr. Wheeler when making the survey of the block; and three contracts are in operation at the present time. Mr. H. Larmer, the County Engineer, is in charge of the works.

Fern Flat Roads.—About a mile of road has been made, and 42ft. of culverting done; and two contracts are in force for additional work. Mr. Larmer, who is in charge, reports serious damage to the roads through the late rains.

Motukaraka Roads.—To date, about three miles of road of from 6ft. to 12ft. wide have been completed; and ten contracts are in operation on the various lines of road through the settlement. Mr. R. Cochrane is in charge.

Punakitere Roads.—Close upon five miles of road from 6ft. to 12ft. wide have been finished, and nineteen contracts for further extension are in hand. A large bridge is also being built over the Punakitere River, which at present cuts the settlement off from the outside world. Mr. R. Cochrane is in charge.

Waimamaku Roads.—A road leading from the county road to the Waimamaku Village Homestead Association settlement and to the other village settlement in this locality has been laid off, and the first three miles of it are under construction by the Maoris who gave the land for it on condition that they should have the work, and instructions have been sent up to put the settlers on to further works, as far as the sum allowed will go. The actual selection for sections has not yet taken place, but there are about thirty men on the ground waiting for it, who are clamouring for work. Mr. R. Cochrane is in charge.

Hukerenui Roads.—Three small contracts have been let in this settlement, and specifications prepared for a bridge by Mr. A. B. Wright; and arrangements have been made for doing something to the main road from Kawakawa, though little or no good can be done whilst the road remains in the fearful state it is reported to be in.

Whamanaki Roads.—One mile of road 5ft. to 10ft. wide has been completed on a line which leads through one of the village settlements, and which at the same time forms part of a main line of road out to the Great North Road. As many of the settlers in this settlement find employment at the saw-mill, roadworks to give them work are not of so great a necessity. Mr. E. J. Fairburn is in charge.

Parua Bay Roads.—About a mile and a quarter of 6ft. to 10ft. road is completed, and four contracts are in operation. This work is partly on the main line of road referred to under Whangarei-Taheke. Mr. E. J. Fairburn is in charge.

Omaha Roads.—About three miles of bridle-roads have been made, by twenty-four contractors, on several lines of road, so that most of the sections in this settlement are fairly provided with access, though something more is yet required to be done. Until more funds are available, however, the work is at a standstill. Mr. H. Lundius has had charge.

Main Road through Dacre's Claim.—About 3 miles 16 chains of this road have been constructed by the Rodney County Council, supplemented pound for pound by the Government, in order to give access by land to the special settlement at Omaha from the port of Mahurangi.

Waitakerei Roads.—Three quarters of a mile of cart-road has been made here, and it is proposed to add a small bridge to enable the settlers to get at the remaining sections.

Swanson Roads.—Something over half a mile of bridle-road has been formed, and some culverts put in. Further works to give employment to the settlers are about to be started.

Komakorau Drain.—This has been levelled, and a contract for 1 mile 4 chains let to the village settlers whose lands it affects. The contract is still in progress under Mr. F. H. Edgcombe's supervision.

It will be seen from the above that the department has had in hand during the last twelve months fifty-one separate and distinct public works, in ten of which the local bodies took the principal part, subject to a general supervision of specifications and a final inspection by the department. The village-settlement works, being generally at considerable distances apart, and the men engaged on the contracts being mostly new to the work, require a large amount of constant supervision, which of course increases the cost of the whole. With the exception of the first start at Herekino, all work has been done on the permanent grades. The amount of correspondence and account-keeping in connection with these various works has very materially added to the other duties of the department. Payment, as the work progressed, has in nearly all instances been made direct from the office, and generally this has been accomplished by return mail, though occasional delays occur in waiting for imprest moneys from the Treasury. I append hereto a tabular statement of the work carried on during the year.

S. PERCY SMITH, Assistant Surveyor-General.

TARANAKI.

Pukearuhe to Mokau.—This road is altogether sixteen miles in length, and, when completed, would open communication with Crown lands to the extent of some sixty thousand acres on the north of the Mokau River. During the year eleven small earthwork contracts, altogether two miles and a half in length, have been completed by the Natives, at a cost of £378 6s. 8d. A further expenditure of £101 10s. has been incurred in the employment of a regular road-man, and occasional assistance in removing slips and repairing small bridges so as to keep the road open for travellers. In all £479 16s. 8d. has been spent. The vote was £500. The present position of the road as regards traffic is as follows: For the first seven miles and three-quarters from Pukearuhe to Tongaporutu, by way of the beach as far as the Zigzag, is available for horsemen only. From Tongaporutu to Kawau, a distance of three miles and a half, the road has been formed and culverts put in, but the rivers have to be forded. This section is open for wheeled traffic, but will eventually need widening. It is on this section that the work has been done this year. From Kawau to Mokau drays can be taken at low tide only, no work further than felling and clearing having been done on this length of road.

THOMAS HUMPHRIES, Chief Surveyor.

Inglewood to Waitara (Junction Road).—Of this road, 5 miles 76 chains—viz., from Durham Road to Tariki Road—has been graded and formed 15ft. wide; the necessary drains and culverts made (or, in places where the nature of the soil or rock would permit, tunnels substituted); and bridges erected over the Manganui, Maketawa, Makara, Mangaone, and a small stream unnamed. The total expenditure on these works was £2,362 13s. 5d., and the work benefits the whole of the lands recently sold and now being cleared and occupied between the Moa District and the Waitara River, comprising over ten thousand acres of first-class land. This road (Junction Road) is also the main one leading to the Crown lands now about to be offered for sale on the north side of the Waitara River, in the Taramouku and other valleys, the area in that part beneficially affected being over eight thousand acres of good land; besides which the road will benefit other blocks—some partly surveyed—not included in the above areas.

The Manganui Bridge is of a total length of 120ft., and consists of centre-span of 95ft. and two short end-spans. The bridge is built entirely of totara with maire brace-blocks, the piers being on concrete foundations. The banks of the stream were precipitous rock, the heights being 35ft. above the water on the east side and 60ft. on the west side. The floor of the bridge is 50ft. above the water. Cost of bridge, £799 8s. 6d.

The Maketawa Bridge is of a total length of 81ft., the main span being 60ft. This bridge is also built of totara and maire, the foundations of the piers being concrete. The cost of the bridge was £351.

The Makara Bridge 33ft. long, the Mangaone 26ft., and another small one 20ft., a total length of 79ft., are built of heartwood of rimu; and as the timber was carefully chosen and is of excellent quality a comparison can in future years be drawn between the respective merits of totara and of the rimu of this district.

The cost of the above three bridges was £159 11s., a portion of which has not yet been paid.

Against the item "Inglewood to Waitara" the following works have also been in hand: The felling on the Kaimata, Mangaone, Rimutauteka, Bristol, and Toetoe Roads, in the Huiroa Survey District, the bush being felled a chain wide, and a cartway cleared and stumped in the centre 12ft. wide. This work was done at the low price of 14s. per lineal chain, the total length being over thirteen miles, the cost £726 2s. An additional three miles of the Rimutauteka and Bristol Roads are still in the hands of the contractors. These roads give access from the main road (Junction Road) to the deferred-payment and perpetual-lease sections in Blocks I., II., and III., Huiroa District, and Blocks XIV. and XV., Waitara District, part of the ten thousand acres alluded to as opened by the Junction Road.

Ironsand Block, Egmont District.—The cost of these works for the past year was £160 5s. 1d., and consisted of completing the felling and culverting contracts on the Durham and Dudley Roads, and some draining and forming on the Egmont Road; the work being done to give access to the Crown lands in the Ironsand Block (5,000 acres) then being sold, and now being rapidly settled upon.

Egmont Road.—Road-formation, 5 miles 60 chains. Amount paid during the year on account of contracts, £371 11s. 1d. The road has been drained, culverted, graded, and formed from the metalled road (Junction Road) at Egmont Village to the Mount Egmont Forest Reserve, a distance, as shown above, of five miles and three-quarters. It now gives ready and easy access to a large portion of the above reserve and to some Crown lands adjoining (unsold sections in Ironsand Block), and with an additional moderate expenditure would enable tourists to ascend Mount Egmont, making the journey from New Plymouth to the summit and back in one day. The work is completed, and the final payment (£92 15s.) has been paid since the 30th June.

Roads east of Midhirst.—These works, to cost £200, are only just commenced, and are for the purpose of giving readier access to about two thousand acres of Crown lands in Block X., Huiroa District. The works include felling about a mile and a half of Croydon Road, also cutting scrub, and culverting about a mile and a half of the same road, which was felled some years since; also the excavation of a tunnel (to avoid the necessity of building a bridge) and some formation on the cross road. The felling is being done the usual 1 chain wide, and a cartway cleared and stumped 12ft. wide, at the price of 14s. per chain. The cutting scrub includes not only cutting down all scrub for a width of 30ft., but clearing it away, and clearing and stumping a track (cartway) in the centre 12ft. wide, the cost per chain being 5s. Only £20 has been paid on account of these contracts.

Roads east of Stratford.—Length felled to date, five miles. Cost: Amount paid to the 30th June, £253 15s. 3d. These works include the felling of the Fraser and parts of the Rotokare and Campbell Roads, the felling being done 1 chain wide, the Rotokare Road having a cartway cleared and stumped 15ft. wide, and the Fraser and Campbell Roads having cartways cleared and stumped 12ft. wide; the cost in each case, by tender, being 14s. per lineal chain. The works give access to the Crown lands sold in Block XIV., Ngaere, about three thousand acres, and which are now being cleared and occupied.

Native Trust Blocks (£277 5s. 9d.).—This includes the felling of three miles of Kahui Road, Rahotu, the road being felled the usual 1 chain in width, and a cartway cleared 20ft. wide. This is now in process of being graded and formed by Native labour (contracts at low prices), and when completed will be the principal outlet for the block of Crown lands, about eight thousand acres in area, lying between the Parihaka Native reserve and the Mount Egmont Forest Reserve. The expenditure for the year on this road was £235 9s. 9d.

About 1 mile 45 chains of the Waiteika Road, Opunake, has been drained, graded, and formed by Native labour (contract), the cost being £110 16s., of which, however, only £41 16s. has been paid to the 30th June. The road leads through Native lands leased to Europeans by the Public Trustee, and is necessary to give access to the several holdings. About two miles and a half, in addition to the above, yet remains to be done, the plans for which are now being prepared.

Roads through Bush, Waimate Plains (£639 17s. 7d.).—This expenditure covers payments to the 30th June on the draining, culverting, grading, and forming 20ft. wide of the Eltham Road from Taungatara Stream to the Punehu Village Settlement, a distance of 1 mile 35 chains; also the metalling (a light coat) of the soft parts of the above length. The cost of this work will be £244 5s. 9d., of which amount only £175 12s. 7d. has been paid.

Two bridges have been constructed on this road, the one over the Mangahumi Stream being a single span 46ft. in length, the timber being totara, and the bridge being built on concrete piers. In order to shorten this bridge a stream-diversion was cut through a point of the road, and on this the bridge was erected; the saving thus effected being fully 40ft., besides the advantage of straightening the stream and avoiding flooding of the road in high freshets. The old bed of the stream has been filled in, a large culvert being placed under the embankment to take away drainage and flood waters. The cost of the bridge—including cutting stream-diversion, making approaches, and building 4ft. culvert 30ft. long (of totara)—was £273, part of which is still unpaid.

The Taungatara Bridge has a main span of 60ft. and two end-spans, the total length being 78ft. It is also built of totara and maire, and rests on concrete piers. The total cost, including approaches, is £370, a portion of which was unpaid on the 30th June. Of the total expenditure on this road for the year (£639 17s. 7d.), the sum of £60 6s. is for wages to the surface-men employed in keeping the gravelled road from Opunake to Taungatara Stream (5 miles) in repair.

The foregoing expenditure benefits the Crown lands, about five thousand acres, in Blocks XI., Opunake, and IX., Kaupokonui, and the Punehu Village Settlement lands.

Bush Lands inland of Patea (£283 12s. 6d.).—The work includes the felling of about six miles of the Makino, Kawaiti, and Maben Roads, Opaku District. The Makino and Kawaiti Roads have been felled 1 chain wide, and cartway cleared and stumped in the centre, 12ft. wide, at a cost of 14s. 6d. per chain. The felling of the Makino Road—2 miles 9 chains—has been completed, and about a mile and a half of the Kawaiti Road was completed by the end of June.

The Maben Road has been felled for a length of nearly two miles and a quarter, half a chain wide, and a bridle-road has been roughly graded and formed and culverted at a cost of 12s. per lineal chain. The above work opens up Crown lands set apart as small grazing-runs in the Opaku District, the area benefited being about five thousand acres.

The total expenditure for the year ending the 30th June, 1887, on the whole of the works mentioned in this report, including all expenses for engineering, plans, travelling, supervision, and an overseer's wages, amounts to £5,387 0s. 8d., the above expenses being in the proportion of a little over 5 per cent. of the whole. The supervision also includes my inspection of roadworks carried on by the Wairoa Road Board on the Block IV. and Ngutuera Roads, Waverley, and by the Ngaere Road Board on the Opunake Road, Ngaere, previous to progress or final payments being made; the expenditure being over £1,500.

The works at present in hand are the completion of the felling of the Rimutauteka, Bristol, and Croydon Roads; and works on the cross road, Huiroa District; the Campbell and Mangawhero Roads, in the Ngaere District; the Kawaiti Road, in the Opaku District; the formation of the Kahui

and Waiteika Roads, Opunake District; and the opening of new roads in the block of land north of the Waitara River (Ngatimaru) soon to be offered for sale. I am also preparing plans for a bridge over the Waitara River Junction Road; for bridges over the Punehu, Ouri, and Oeo Streams, Eltham Road, Opunake; and for road-formation on junction of Eltham and Waiteika Roads (a total of about 9 miles), so as to be in readiness should the necessary votes be passed during the coming session of Parliament.

In consequence of the large amount of time I have had to devote to roadworks during the past year, my work as Ranger has fallen somewhat in arrears. These, however, I hope to overtake during the next three months, as a large number of the road contracts are now completed. I have, however, reported on 195 deferred-payment and perpetual-lease sections, containing 14,753 acres (in this I have been assisted by Mr. Stanners, Road Overseer), and have made special reports for purchasing, transferring, or capitalising on twenty-five sections, containing 2,350 acres; also reports on nineteen Road Board schedules, in many instances having to inspect the roads, the plans of work, and the Road Board's books; also eleven special reports on various works, including one on the drainage of the Ngaere Swamp (in which I was very materially assisted by Mr. T. L. Humphries, Assistant Surveyor). And there has been the usual office-work, preparing plans and specifications for the roadworks under my supervision, the payments of contractors, and weekly returns to the Treasury; and the regular outward correspondence of over 370 letters.

G. F. ROBINSON, Crown Lands Ranger.

HAWKE'S BAY.

SINCE the first votes to open up Crown lands were taken in 1880 to the end of the period now under review the sum of £34,205 has been expended on roads giving access to lands which have been or are being prepared for settlement.

I arrive at this amount by taking the total stated by the late Chief Surveyor in last year's report, and adding to it the amounts spent upon roads in the Makaretu and Te Ohu Blocks, the Woodville Special Settlement, and the Wainui-Tahoraiti Road. This does not include grants to local bodies from the proceeds of lands held under the various deferred-payment systems, nor the direct grants to such bodies.

The total area selected since 1880 out of the blocks affected by the expenditure stated above is about a hundred thousand acres, and, if it is assumed that the same ratio between acreage and capital value holds good for this year as for the period between 1880 and 1886, then this expenditure has affected selected lands of a capital value of £134,000.

The grants to Road Boards from lands taken up under the various deferred-payment systems amount to £21,567 up to the present time.

Rotokakarangu Block.—A grant of £1,250 was placed at the disposal of the Wairoa County Council in the early part of the year for opening up the Rotokakarangu Block. I have not as yet had the opportunity of visiting that part of the district, but the Chairman of the Council has been good enough to furnish me with the following details: 4½ miles of the Ohinépaka-Patere Road has been formed for dray traffic 12ft. in width, starting from the Wairoa-Napier Main Road in the Ohinépaka Valley. Three miles of a 5ft. bridle-track has been formed from the Cricklewood Junction towards Patere. A contract for a further extension of the dray-road of a mile in length is now in operation, and is expected to be finished by this time.

The above works include a timber dray-bridge 22ft. long, besides four timber and forty-two pipe culverts; but the cost is not stated.

Ruataniwha and Makaretu Blocks.—Fourteen miles of road-lines have been cleared 1 chain wide, and, except on steep sidings, stumped 16ft. wide in the centre, and the whole length has been sown with grass-seed. These roads give access to some nine thousand acres of forest-land, which is now open for selection under the deferred-payment and perpetual-lease systems, and will also render an education reserve of 2,000 acres more accessible. For formation purposes the worst parts of these roads are adjacent to the Makaretu Settlement; and when I visited the ground I formed the impression that the land would be much more readily taken up if a sufficient amount of formation were done to make a passable horse-track. An expenditure of about £250 would do this. The total cost of the works above described, which were finished at the end of last month, was £1,343 16s. 4d.

Te Ohu Block.—Two miles and a half were explored, graded, cleared 1 chain wide, and stumped 16ft. wide through the Te Ohu Block, at a cost of £407 10s. The immediate area to which this gives access is 1,400 acres of good forest-land, well suited for settlement in moderate-sized farms. Most of the surrounding lands belong to Natives, but, if these should at any time be acquired, access to a considerable area could be got by a continuation of this road.

Woodville Special Settlement.—44 chains were cleared 1 chain in width through the Woodville Special Settlement, at a cost of £57 6s. 3d. The Waipawa County Council has agreed to subsidise £50 granted by the Government by the same amount, to form a passable road to this settlement.

Wainui to Tautane Road.—7 miles 73 chains of the Wainui-Tahoraiti Road have been formed, including two small bridges and 129 culverts; and 3 miles 26 chains on a branch-line through the Tautane Special Settlement have been cleared through forest, at a total expenditure of £2,605 1s. 7d. Three formation contracts, including 5 miles 41 chains, are now in operation on the main line, besides a clearing contract for 2 miles 63 chains near the Tautane Village Settlement. I regret to have to report that the exceptionally heavy rains which have fallen during the past few weeks have brought down slips of considerable magnitude, obstructing, for a time, dray traffic in places. This made it necessary to employ temporarily one or two extra surfacemen, in order that works on current contracts might not be brought to a standstill. It is satisfactory to be able to report that these works are having the immediate effect of inducing settlement, and that the greater part of the land

offered for selection last month has been taken up. I anticipate that all this still remaining, besides the 1,005 acres lately surveyed as a village settlement, will be taken up within the next six months.

Miscellaneous.—Umutaoroa Block: A balance of £13 15s., which had been held over from the last contract, has been authorised to be expended by the Danevirke Road Board on the satisfactory completion of the work. An outstanding balance of £12 has also been paid on roadworks in the Maharahara Block. There has been £10 15s. 8d. paid for extras to bridges on the Gisborne-Wairoa Road.

G. W. WILLIAMS, Chief Surveyor.

WELLINGTON.

Tokomaru Block.—In fulfilment of engagements £650 has been advanced to the Waitotara County Council, who have let contracts amounting to £704 for the construction of two miles and a quarter of dray-road on a branch of the Brunswick line through Mr. Corry's property, to give access to West Tokomaru, recently taken up under the small-run system. The works are under the able control of Mr. Roland Garrett, C.E., and are about half finished. This road is the commencement of an important line of future communication following the summit of the watershed between the Waitotara and Wanganui Rivers. The Crown lands affected comprise 5,000 acres, but they are still very remote and inaccessible, besides being of a very hilly and broken character.

Otairi Block.—Two contracts, comprising respectively 80½ chains and 82 chains, were let and completed on a length of the Ridge Road on the South-eastern Otairi Block. The work consisted of bush-felling 1 chain wide and stumping 16ft. wide; cost, £109 3s.—one of the contracts being at the rate of only 11s. 11d. per chain. Mr. Alexander Dundas, District Surveyor, laid off the roads, and prepared specifications and plans; and Mr. District Surveyor John Annabell inspected, and reported the work as faithfully done. The area of Crown lands benefited is 3,000 acres.

The Rangitikei County Council obtained £300, and expended it in metalling the Marton to Murimotu Road from near Hunterville, and this completes the road to within one mile of the Otairi boundary. This benefits the whole of the Crown lands in Otairi, comprising 15,000 acres.

Maungakaretu Block.—The Rangitikei County Council also were intrusted with £200 to widen and complete the Ongo line as far as Turakina River. The final payment on account of the contract was made last December. This line leads in the direction of the Crown lands on the Upper Turakina, the area of which is 10,000 acres, although far distant from the terminus.

The Upper Wangaehu Road Board were authorised to expend £150 in extending the dray-road along Hale's Wanganui-Murimotu track as far as Mangamahu. The works were well advanced towards completion last January, when £100 was paid on account. No report has since been received at this office.

Mr. A. D. Wilson laid off or surveyed twenty-two miles and three-quarters of roads outside and upon Maungakaretu Block, and his road party felled 150 chains of the Hale's Road north of Matawhitia Block southern boundary, 1 chain wide, stumped it about 16ft. wide, and formed a horse-road 4ft. wide, besides felling and stumping 40 chains more. The whole 190 chains cost £279. These works benefit the Maungakaretu Crown lands, which amount to 20,000 acres on that side.

Waitapu Block.—Mr. District Surveyor Alexander Dundas located and surveyed seven miles of roads, and prepared plans, sections, and specifications for proposed roadworks of five miles of the same. The area of Crown lands in the locality is 10,000 acres.

Otamakapua Block.—The Kiwitea Road Board have not completed the proposed metalling of the Kimbolton Road extension authorised as far back as March, 1886.

Mr. Charles Field during the year executed the following works: Kimbolton Road extension: Bushwork and formation for horse traffic, 546 chains; bridges, 15 chains; culverts, 27 chains. Oroua Branch Road: Bushwork, &c., as on above, 28 chains. In addition he maintained fourteen miles of road, felled thirty acres of bush on reserve at Pēep-o'-day, cut three miles of pack-track, sowed 100 acres along roads and the reserve with grass-seed, graded seven miles of roads, inspected five contracts. The total cost, including tools, was £987 17s. 5d.

On the Middle and Bluff Roads branches to the Kiwitea from the Kimbolton Road extension at about twenty-three miles from Feilding, three contracts were let for bush-felling 1 chain wide and stumping 16ft. wide, the lengths and figures respectively being 140 chains for £150 10s., 132 chains for £110 6s., and 162 chains for £170 1s. Mr. C. A. Mountfort laid off these roads, and Mr. Charles Field supervised the works to their completion last June. About thirty thousand acres of Otamakapua are benefited by these works, including the Pemberton Special-settlement Association Block. Mr. Alexander Dundas prepared plans and specifications for a horse-road along the Oroua branch line from the Kimbolton Road extension. A length comprising 307½ chains of bush-felling 1 chain wide, stumping 16ft. wide, and formation 4ft. wide in solid, was let for £410. Mr. Charles Field reports the work as almost completed. This line will be of great service to those settlers on the eastern side of the Birmingham Block and the Feilding Special-settlement Association whose selection lies on the eastern side of the Oroua River. The line will give an approach to about ten thousand acres of Crown lands adjacent to those settlements.

South Pahiatua, Rangitumau, and Mangatainoka Blocks.—Eighteen miles of road-lines were located, and engineering surveys were made of twenty-two miles, eighteen miles of which were mapped. About forty-one miles of roadworks have been commenced, carried on, or completed during the year, to the value of £5,593, in seventeen contracts, the particulars of which are as follow:—

	£	s.	d.
Pahiatua-Mangahao Road: Contracts Nos. 1 and 2, comprising three miles and three-quarters of bushwork and formation, &c.	1,262	9	8
Pahiatua Village Settlement roads: Contract No. 1, comprising one mile and three-quarters of bushwork	120	2	3

	£	s.	d.
Mangatainoka Central Road: Contracts Nos. 1 and 2, comprising four miles and three-quarters of bushwork ...	426	18	0
Makakahi Road: Contracts Nos. 16 and 17, comprising three miles and a half of bushwork ...	269	9	0
Mangatainoka North Road: Contracts Nos. 20, 21, 32, comprising five miles and three-quarters of bushwork, formation, bridges, and culverts ...	2,029	4	6
Makakahi Road: Contracts Nos. 25 and 26, comprising three miles of bushwork ...	249	5	0
In progress—			
Central Mangaone Road: Contract No. 30, comprising three miles and a half of bushwork ...	264	0	0
Pahiatua Rock Road: Contract No. 31, comprising two miles of bushwork, formation, bridges, and culverts ...	349	19	0
Dorset's Road, Rangitumau: Contract No. 34, comprising two miles and a quarter of bushwork, formation, and drains ...	680	16	0
Tawataia Road: Contract No. 35, comprising 67 chains of bush-felling 1 chain wide, stumping 33ft. wide ...	45	1	0

Miscellaneous.—Ten miles of grass-seed were sown along the lines cleared, and protection-works were carried out on the Pahiatua-Mangahao Road. A party was employed to clear the slips on Contracts Nos. 1 and 2, Pahiatua-Mangahao Road. This road was also maintained for some time. On the Toritea Road a party of "unemployed" cleared and formed half a mile at a cost of £120. The total cost of these last-mentioned works amounts to £226 13s.

The whole of the Forty-mile Bush engineering surveys and works were carried out by Mr. Robert H. Reaney, in a thoroughly satisfactory manner.

Puketoi-Aohanga Country.—Mr. J. D. Climie, District Surveyor, laid off a line of roads from the saddle on the Toritea Road to the headwaters of the Aohanga on the East Coast. Mr. Climie showed me over this line, and I formed the opinion that it had been laid off judiciously: it was an uncommonly difficult line to locate, owing to the gorgy character of the Makuri, the broken character of the country, the altitude of and the abrupt descent on the eastern side of the Puketoi Range. The length of this line is twenty miles between the Tiraumea and Burling's Track; it should prove to be a very useful connection between the East Coast and the railways and centres of settlement, and should be constructed as soon as possible. Mr. Climie made engineering surveys and plans of five miles and a half of this and adjacent roads. The area of Crown lands benefited is about twenty-five thousand acres.

Kaiwhata District.—The final payment was made to the Wairarapa South County Council on account of works executed on about seven miles and a half of the Gladstone-Kaiwhata Road, which was improved by bush-felling, stumping, bridging and culverting, and formation, to fit this line for horse-traffic. About twenty thousand acres of Crown lands were more or less affected by this expenditure.

The total amount expended in the foregoing works, or in connection with this, was about £12,000.

J. W. MARCHANT, Chief Surveyor.

NELSON.

Pigeon Valley to Motueka.—The work done on this road has been in the hands of two Road Boards. The Waimea Road Board has completed 125 chains in widening the present horse-track into a dray-road, at a cost of £156 10s., and specifications are being prepared for the amount of balance of sum allotted—viz., £93 10s. The Upper Motueka Road Board have widened the horse-track to a dray-road for a distance of two miles, at a cost of £250. An area of about a thousand acres is rendered more accessible.

Pretty Bridge, Valley Road.—This work is also in the hands of the Waimea Road Board. Of forming, part metalling, and improving the above road 160 chains have been completed, at a cost of £150 16s. 2d.; and work is being undertaken to the amount of balance due—viz., £49 3s. 10d.

Dovedale Road.—Three contracts were let by the Dovedale Road Board for the formation of dray-road with better grade over the Dovedale Saddle. The work done was 75 chains in length, at a cost of £200, and was constructed on a graded line surveyed by Mr. H. Tarrant two years ago. The above road was supervised by the department.

Tadmor Road.—After some delay the last contract, No. 21, length a mile and three-quarters, has been let and completed at a cost of £406, and the line is now opened for traffic throughout for a distance of seventeen miles and three-quarters. The bush throughout has been felled 66ft. wide, clearing 14ft., formation 12ft.; and fillings and approaches to bridges and culverts have been metalled. This road will give access to about ten thousand acres of land.

Matakitaki Road.—The Inangahua County Council was authorised to expend £500 in widening the existing horse-track into a dray-road, on condition that they expended also a like sum on the same. A contract has been let for £928 to Messrs. Campbell and Co., and two progress payments on Government account have been made, amounting to £285. This work is still in hand.

Ahaura (Mason's) to Haupiri.—Mr. H. Tarrant made a survey of five miles, and prepared plans and specifications for widening the horse-track to a dray-road, with formation 14ft., and metalling 10ft. Contracts Nos. 32 and 33 were let in March for £563 and £744 respectively. The first is nearly completed, and has been delayed by bad weather, but little or no work has been done on the latter. One progress payment has been made on No. 32 of £178. A further survey of twelve miles to Mason's has been completed.

Ahaura to Kopara and Amuri.—Mr. Tarrant has also completed the fieldwork of twenty miles and a half from Mason's to the Ahaura Saddle, making a total of thirty-seven miles and a half of graded road-line, at a cost of £11 12s. 8d. per mile.

Grey Valley via Clarke River to Maruia.—This work was undertaken by the Grey County Council out of a vote of £200 for a line of road through the Clarke Valley to avoid the Upper Grey Gorge. A contract was let to Messrs. Gillon and Devery to cut a track for eleven miles to be made practicable for horse-traffic. A progress payment of £100 has been made, and the work is not yet completed.

JOHN S. BROWNING, Chief Surveyor.

WESTLAND.

Pounamu to Teremakau.—Giving access to 1,200 acres of good agricultural lands (vote £500). The work is being carried out by the Grey County Council under my supervision. Contracts let for three sections in March, 1887, for respectively £177, £105 12s., and £111, and progress payments made, up to the present, of a total of £302 15s. The work consists principally of widening a horse-track to a 10ft. dray-road.

Waikukupa to Cook's River Flat.—Making accessible 4,000 acres of very good agricultural lands (vote £1,000). A continuation of the Main South Road, length two miles and three-quarters; formation width 9ft., metal 5ft.; work let for £1,113 10s. Now completed, but progress payments made to the amount of £607 15s. only. The work is carried out by the Westland County Council under my supervision.

Gillespie's to Cook's River Flat.—Giving access to 7,500 acres of very good agricultural lands (vote £1,920). Length, eight miles; formation width 5ft., metal 3ft. Contract let for part of the work only; amount, £1,022. Progress payments to date, £616 5s. Nearly completed. Carried out under my supervision by Westland County Council.

Mahitahi to Paringa.—Giving access to 4,000 acres of land suitable for settlement (vote £1,400). Length, six miles; formation 7ft., metal 4ft. Contract for same was let during the present month, but the contractor has not yet begun the work. It also will be carried out by Westland County Council under departmental supervision.

Cascade Valley Road.—Making accessible 16,000 acres of good settlement lands. Length, four miles and a half; formation 5ft., metal 3ft. Contract price, £1,113 10s. and extras, consisting principally of extension to Cascade River ford, £96 10s. The work was completed last month (May, 1887).

I have also supervised the following goldfields tracks, which have been already described by Mr. Gordon in the Mines Report: Cedar Creek Road, Browning's Pass Reef Road, Rough Wainihi-nihi to Upper Kawhaka Dam, Gentle Annie Track, Okarito Forks to Teal Creek Track.

GERHARD MUELLER, Chief Surveyor.

CANTERBURY.

Black Hills Road, by the Hurunui.—Although this road was completed last year, the final inspection was not made. The whole cost was £760 5s., the Government grant being £750. £500 of this sum was certified to this year.

Loburn-Kowai Road.—Contracts are let for the formation, including bridges and culverts, for the whole length of 2 miles 64 chains, for £312 19s. These contracts are taken at a price very much below the estimates, and, if the difficulties are as great as I anticipate, it is questionable if they will be carried out; if they are not, the Ashley Road Board will have to finish the road at a cost exceeding the amount of the contracts, so that, although £312 19s. is all the present liability, the Government must anticipate a further expenditure. In the report of my visit to this road on the 24th of June, 1887, it is stated, "I found about a mile of the formation in progress, and the bridge in course of construction." On this report the Ashley Road Board's application for progress payment of £150 was signed and forwarded to Wellington.

Kuku Pass Road.—Two contracts, for 120½ chains of formation, have been let for £221 19s. 7d., but no payment has been made this year. This is an extension of former work which has not been proceeded with since the end of 1885. The amount shown to be expended on the old work by the Ashley Road Board since August, 1883, stands in the Road Book as £2,992 0s. 10d., against the vote of £3,000; but, as no doubt the Board has been at the cost of repairs exceeding the difference, it was deemed better to start afresh with the new vote and not carry forward previous payments.

Glentui Forest Road.—A length of 1 mile 64 chains has been made, including many culverts and small bridges, at a cost of £852 5s. 9d., £500 of which has been Government grant, and the balance found by the Ashley Road Board. The Board anticipate obtaining an additional £500 grant to continue the formation beyond. About 40 chains further will bring the work up to the end of the road surveyed by Mr. Brodrick.

Oxford Bush Road to Upper Ashley.—£300 has been authorised during the year, but the money had been previously expended. The total length of formation as reported last year is thirteen miles. An additional grant has been obtained to extend the road down the valley of the Townsend. The account stands in the Road Book as—Amount paid to the Oxford Road Board, £4,288 10s. 9d.; expended by Oxford Road Board, £4,270 14s. 9d.; authorised by the Surveyor-General, £4,345. I am unable to close the account for want of information. The Board has expended considerable sums in repairs, &c., on this road, exceeding the balance of the amount unaccounted for.

Blackford-Redcliffe Road.—Length, 1 mile 68 chains; to be carried out under the direction of the Ashburton County Council. Specifications and plans have been submitted to the office and approved, subject to the expenditure being kept within the limit of £300, the Engineer's estimated cost. No payments have been applied for. I understand that the work will be completed at the end of June, 1887.

Waihao-Hakateramea Road.—£530 15s. has been paid, or the vouchers forwarded from this office during the last year. These payments are subsidised by equal payments by the Waimate County Council, and were made to contractors and day-labourers principally employed completing contracts which the original contractors failed to carry out. Six miles of this road or roads—for there are two, Skevington's and Pentland Hills—are now completed; but only a portion of the work has been done this year. It is impossible to define the length done; but, if you take the proportional payments as a criterion, about one-third, or two miles, have been done this year. On Skevington's Road there is still about a mile to finish before reaching the junction with the Pentland Hills Road.

Road on Reserve 1,263.—The expenditure of £42 10s. by the Levels Road Board on 26 chains of road has been certified to. This amount is the final payment of the grant of £350. The work, however, was done in 1885.

WALTER KITSON, Inspector of Surveys.

OTAGO.

Beach Street, Pembroke Road.—This road has been completed, 25 chains having been formed, culverted, and catchwater drains made.

Block XIV., Lower Wanaka.—1 mile 30 chains of this road have been formed, culverted, and drained. 2,407 acres of surveyed land and 5,200 acres unsurveyed have been benefited by it.

Glendhu-Bluff Road.—2 miles 40 chains have been formed, culverted, and drained, and 3,000 acres of unsurveyed land benefited. Road completed.

Glenorchy to Precipice Creek Extension.—1 mile 12 chains formed, culverted, and drained. Road completed, and 2,600 acres of surveyed land benefited.

Martin's Bay, via Greenstone, Track.—From the junction of the Caples and Greenstone westward through the bush seven miles 4ft. formation have been completed, and bush-cleared, foot-bridges made, and fords improved. Three contracts were let: the first and third have been completed, but the middle one, of 6 miles 60 chains over the saddle along the Passburn, has been stopped for the present, but will be resumed in the spring. Between the Passburn and Pyke Creek 19 miles 40 chains are completed, benefiting in all 28,600 acres of unsurveyed land. The whole of these works have been done under the supervision of Mr. Black, County Engineer.

Waikaia Bush to Clutha Valley.—2 miles 26 chains formed and completed under Mr. L. D. Macgeorge, County Engineer, and 44,000 acres of unsurveyed land benefited.

Blocks I., IV., VII., Kurow.—5 miles 60 chains formed; also culverts and pitched crossings made. 10,000 acres of surveyed land benefited, and 10,000 of unsurveyed.

Kurow Flat Road.—2 miles 10 chains completed, formation and pitched crossing; 3,000 acres of surveyed and 3,000 acres of unsurveyed land benefited by it.

Block VIII., Kurow Roads.—33 chains formed and pipe-culverted; 1,500 acres of surveyed and 9,500 acres of unsurveyed land benefited. 50 chains first portion formed, culverted, gravelled, water-crossings made, pipe-drains laid down; and 1 mile 10 chains second portion formed, culverted, gravelled, water-crossings made, and pipe-drains laid down, benefiting 1,600 acres of surveyed and 4,400 acres unsurveyed land.

Block XIII., Moeraki.—72 chains of formation, pipe-culverts, and catchwater-drains made; 1,700 acres of surveyed land benefited by it.

These works have been done under supervision of Mr. C. Banks, Engineer to Waitaki County.

Blocks XV. and XVI., Blackstone Main Road, Ida Valley.—1 mile 60 chains of formation completed, 40 chains gravelled, 1 mile formation not completed, benefiting 5,300 acres of surveyed land and 14,200 acres unsurveyed land.

Block IX., Maniototo.—3 miles formed, culverted, and ditched; 6,000 acres of surveyed land benefited by it.

Block II., Upper Taieri, and VI., Gimmerburn.—30 chains formed and completed; 1,000 acres surveyed and 11,260 unsurveyed land benefited by it.

These works were carried out under the County Engineer, Mr. R. H. Browne.

Blocks III. and IV., Rock and Pillar.—2 miles 30 chains formed and culverted; 7,400 acres of surveyed lands benefited by it. Works under the inspection of Mr. G. Cruickshanks, Inspector of Waihemo County.

Hummockside.—2 miles 60 chains formed, culverted, and pitched crossings made; 2,600 acres of surveyed land benefited.

Runs 171E, 171H, and 171D.—1 mile 23 chains formation and culverts; 10,000 acres of unsurveyed land benefited by it.

These works were done under the inspection of Mr. Valentine, Inspector of Waikouaiti County.

Spylaw Creek, Run 212.—2 miles 36 chains formed and culverted; 1,250 acres benefited by it.

Waitahuna West District, Run 106.—3 miles 40 chains formed and culverted; 2,000 acres of surveyed land benefited by it.

Lawrence to Waipori, via Bungtown—3 miles 40 chains formed and culverted, and a bridge over Bungtown Creek made; 8,000 acres of surveyed land benefited by it.

Beaumont to Miller's Flat.—20 chains of formation, culverting, and ditching, and 21 chains widening formation at Rocky Bluffs, &c.; 10,000 acres of unsurveyed land benefited by it.

These works were carried out under the supervision of the Tuapeka County Engineer, Mr. Edie.

Glenomaru District Road.—66 chains formed, and 26 chains bush-cleared; 4,000 acres of unsurveyed land benefited by it.

Catlin's Main Road.—24 chains formed and metalled, 20 chains formed only; 2,000 acres of unsurveyed land benefited by it. Mr. T. Paterson supervising the work for the Clutha County.

Education Reserves, Southland County, Wendon District.—2 miles formed, metalled, and stone- and box-culverts put in; 6,000 acres of surveyed land benefited by it.

Waikaka to Wendon and Greenvale.—78 chains formed, gravelled, and 12in.-pipe side-drains laid down; 6,000 acres of surveyed land benefited by it.

Fortrose to Waikawa through Runs 177 and 257.—Two contracts of 7 miles 25 chains are in progress, consisting of formation, water-openings, side-drains, box-drains, and stream-diversions, and when they are completed there will be a continuous road between these two places, benefiting 13,000 acres of surveyed land. Two or three miles at the Waikawa end, which were formed some time ago, will have to be repaired, and two or three branch roads will have to be opened through the land now being surveyed. The main road should also be extended at the Waikawa end, and a new jetty erected. Mr. C. H. Howorth, the Southland County Engineer, supervised the expenditure of these three items.

By the above it will be seen that a total of nearly 87 miles of road has been improved, giving better means of access to over 80,000 acres of surveyed land and nearly 160,000 acres of unsurveyed.

It is difficult to over-estimate the importance of those pioneer roads, as without them it would be simply impossible to settle the Crown lands in most cases; and it is a matter of regret that more money cannot be spared for this purpose, as these roads are the most truly reproductive works that can be undertaken.

C. W. ADAMS, Chief Surveyor.

SOUTHLAND.

Blackmount to Deferred-payment Land (Waiau).—Mileage formed, $1\frac{3}{4}$ miles; acreage rendered better accessible, 5,000 acres. This road has been formed on an almost uniform ascending grade from Ligar Creek, near the Blackmount Homestead, to the saddle overlooking the Redcliffe Creek. The works consist mainly of side-cutting and of culverts. The money already expended has enabled the road to be made passable to the Ligar-Redcliffe Saddle, but, ere through traffic up the Waiau Valley can become possible, an additional piece of side-cutting will be necessary from the saddle above mentioned to the flat along Redcliffe Creek. The forming of this piece of road would open up a considerable amount of passable land, and would complete a much-needed link on an important line of communication (up Waiau Valley to Mararoa).

Waimatuku Bush.—Mileage formed, &c., $1\frac{1}{2}$ miles nearly; acreage rendered better accessible, 1,800 acres. The work done on this road during the past year consists of 112 chains of formation and ditching, 17 chains of bushwork, and thirteen culverts. The work is in continuation of bush-felling that was done on the same road during the previous year. Some formation, ditching, &c., still require to be done. The road runs nearly north-and-south through the heart of the Waimatuku Bush, and connects the Waianiwa and Waimatuku country on the north with the beach road from Invercargill to Riverton on the south. Apart from opening up a considerable extent of land, the road in question will prove, I feel sure, a great public benefit in linking two districts which, though lying close, were hitherto quite inaccessible the one from the other. It must be remembered that between Invercargill and Riverton there is practically no side road connecting the Beach Road with the road in Wallacetown: hence the public utility of the road now being formed, apart from the fact of the bush sections being themselves tapped.

Winton Tramway to Winton Forest.—Mileage bush felled, 1 mile; acreage that will be rendered better accessible, 500 acres. This road runs along the eastern boundary of East Winton from tramway due north into forest. The saw-mill timber has now been taken off this part of the forest, and in time, no doubt, settlement will gradually take place from the tramway northwards.

Bush Land, Makarewa.—Mileage, $\frac{1}{4}$ mile nearly; acreage rendered better accessible, 400 acres. The work done this year comprises only 17 chains of formation and graveling, and is simply a slight extension of the work done last year. The road from North Road eastward for some $1\frac{1}{2}$ miles is now a fairly good one.

Waikiwi Suburban.—Mileage made, $\frac{1}{2}$ mile nearly; acreage that will be rendered better accessible, 150 acres. The work done consists of 37 chains formation and ditching. The road extends from near Waikiwi Railway-station westward to and across Waikiwi Creek parallel to West Plains Road. The land will not sell till it has been tapped in some way, the country being naturally wet and low-lying.

Wallacetown to Tomoporakau.—Mileage bush felled, &c., $\frac{5}{8}$ of a mile; acreage that will be rendered better accessible, 150 acres. The work done consists of 50 chains bush-felling and clearing. It begins near south end of Dunlop Street, Wallacetown, and some distance from this eastward branches into two, one line running south-eastward and another south-westward to the Makarewa River. Owing to inaccessibility, land would probably not be taken up or occupied till tapped by a road-line of some kind.

Otatara Bush.—Mileage made, &c., $2\frac{1}{2}$ miles; acreage that will be rendered better accessible, 700 acres. The work done during last year consists of 152 chains bush-felling, clearing, and grubbing, 195 $\frac{1}{2}$ chains formation and ditching, 48 $\frac{1}{2}$ chains graveling, and thirteen culverts. This road-line runs through the heart of and is designed to tap the Crown lands in the Peninsula of Otatara Bush. The bulk of the vote has been spent in continuing the road southward to near the point of the peninsula; but, as Government are aware, part of it was devoted to the improvement of the road leading to the bush, some 50 chains there having been previously almost impassable.

Seaward Moss to Awarua Bay.—Mileage made, &c., $2\frac{1}{2}$ miles; acreage that will be rendered better accessible, 2,500 acres. The work done during last year consists of 118 $\frac{1}{2}$ chains formation and graveling, 90 chains of tussocking (including light formation), also bridge of 21ft. span. This now leaves the entire road from Woodend to Awarua Bay gravelled and fit for traffic. In addition to this having been done, a portion of the road along the bay, near the head, has been tussocked and lightly formed, a small bridge having also been placed over Muddy Creek. Hitherto this creek

has been a serious obstacle to traffic. As previously reported, there is a good natural road along the bay; and the tussocking and bridge mentioned (the cost of which has been comparatively small) will make the head of the bay quite accessible from Woodend.

Seaward Forest to Coast.—Mileage made, &c., $4\frac{3}{4}$ miles nearly; acreage that will be rendered better accessible, 5,000 acres. The work done during the year consists of 140 chains of formation, 190 chains gravelling, 110 chains of ditching, 80 chains of tussocking, and eight bridges. This road runs through Seaward Forest at Oteramika Bight, and connects the settled country of Oteramika with the country lying between Seaward Forest and the coast. As already reported, there is a large amount of inferior, nay, almost useless country lying between Seaward Forest and the coast, and between Awarua Bay and the Mataura River. It would be a delusion, however, to suppose that the country is all alike, and I have no hesitation in saying that the new road will tap a large amount of land that will eventually be settled. Much of the land I mention is, no doubt, wet, and could not, even when drained, be regarded as first-class; but it is not simply the peat or moss that parties who have not been through it might suppose. The road, in my opinion, will be of great utility in opening up a considerable extent of second-class country that would otherwise have for ever remained a useless and an inaccessible waste. Should, in the natural course of things, the road ever be extended southward to the beach the advantage to the general public will be very great, there being at present no means of communication between the coast-line and the settled parts of Southland anywhere between the Mataura River and the Woodend-Awarua Road. Prior to the latter road being formed there were no roads connecting the coast with the settled districts at any part of the long stretch intervening between Fortrose and the Bluff. I feel convinced that both roads will ultimately be of immense advantage to the Southland District. I may say that the Seaward Bush Railway intersects the Oteramika Bight Road at the north end, and that the portion of the road north of the Seaward Forest was subsidised by the County Council and Road Board respectively. All of the above roads were constructed under the supervision of Mr. C. H. Howorth, Engineer to the Southland County Council, whose professional skill and carefulness are well known to the department.

Stewart Island Roads.—Mileage of tracks cut, &c., $8\frac{1}{2}$ miles; acreage rendered more accessible, 2,000 acres. The work done during the year consists of 8 miles 14 chains of track-cutting, of fencing and supporting track 1 mile, of 9 chains of drain, and of bridge over inlet between Horseshoe and Halfmoon Bays, also of bridge over Freshwater River. The chief tracks cut were from Oban westward to Freshwater River, and from Horseshoe Bay to Lee Bay. The other items of work were the repairing of road round Halfmoon Bay, the additional fencing and supporting of track Halfmoon to Horseshoe Bay, the forming of drain in Ayr Street, Oban Township, and the construction of foot-bridges over Freshwater River and over inlet between Horseshoe and Halfmoon Bays respectively. All executed by the Resident Engineer, Public Works Department.

J. SPENCE, Chief Surveyor.

SUMMARY of ROADWORKS executed in AUCKLAND.

Name of Road or Work.	Bridle-road.	Cart-road.	Graded in Addition.	Bridges not included in Roads.	Contracts in Force.	Area opened.
	Miles.	Miles.	Miles.			Acres.
Okaihau-Victoria * ...	...	0·5	...	...	1	7,200
Mangamuka Bridge ...	...	...	...	...	...	...
Kohukohu-Rakautapu †	5·5	...	...	...	...	387
Lower Waihou * ...	1·5	0·75	...	...	5	...
Wairua-Helena (Mimiha branch) *	3·25	...	...	...	5	2,000
Whangarei through Taheke *	1·12	...	...	...	1	1,500
Mangapai-Mareretu *	3·5	...	...	...	2	1,200
Paparoa-Waikiekie † ...	1·25	...	...	...	...	12,800
Tatarariki Drain § ...	...	...	...	·75 mile	...	800
Awaroa Drain and Road *	...	...	...	...	1	3,000
Akaaka Drain *	...	...	...	1·5 miles	1	3,000
Waingarua-Akatea * ...	5·5	...	...	...	2	6,000
Whaingaroa-Kahuru § ...	1·0	...	...	...	...	6,000
Whaingaroa-Waitetuna *	5·0	...	...	...	7	...
Aotea-Kawhia † ...	...	...	2·0	...	...	...
Kawhia-Waipā § ...	...	...	...	32ft.	...	...
Alexandra-Hikurangi § ...	...	0·5	...	116ft.	...	...
Cabbage Bay-Cape Colville ...	...	...	...	...	...	...
Puriri-Tairua *	0·5	...	5·5	...	7	...
Waihou Ferry Road § ...	...	1·75	...	...	...	3,500
Rotorua-Rotoiti † ...	0·12	...	5·0	...	...	...
Rotorua-Wairoa || ...	...	...	...	...	...	...
Rotorua-Galatea * ...	...	15·0	8·0	...	2	...
Rotorua-Paeroa † ...	...	...	3·0	...	...	...
Huka Falls Road * ...	...	4·0	4·0	...	2	...
Taupo-Waimarino * ...	...	2·5	...	...	7	25,000
Field's Track * ...	...	4·0	...	30ft.	...	...
Tolago-Arakihi ¶ ...	1·5	10·0	...	...	...	7,300
Ahipara-Herekino * ...	...	...	11·0	...	17	...
Herekino Roads * ...	...	...	...	...	4	10,000
Takahue Roads * ...	1·25	...	...	117ft.	3	5,000
Fern Flat Roads * ...	1·0	...	...	42ft.	2	3,000
Motukaraka Roads * ...	3·0	...	...	...	10	3,000
Punakitere Roads * ...	3·0	2·0	...	...	19	3,000
Waimamaku Roads * ...	...	...	3·0	...	3	4,000
Hukerenui Roads * ...	...	...	0·75	...	3	3,000
Whananaki Roads * ...	1·0	...	4·5	...	2	3,000
Parua Bay Roads * ...	1·25	...	3·0	...	4	1,500
Omaha Roads † ...	3·0	...	...	...	...	2,500
Waitakerei Roads † ...	...	0·75	...	...	...	400
Swanson Roads † ...	0·5	...	...	...	...	400
Totals ...	43·74	51·75	49·75	...	111	117,487

* In progress.

† Complete (also shown in last year's report).

‡ Delayed.

§ Completed.

|| Repaired.

¶ In progress (see last year's report).

STATEMENT of EXPENDITURE in the FORMATION of ROADS to OPEN UP LANDS for SALE, from the 30th June, 1884, to 30th June, 1887.

	1884-85.	1885-86.	1886-87.
AUCKLAND.			
Homestead Blocks, Manganui	£ s. d. 414 15 6	£ s. d.	£ s. d. 40 0 0
Pakiri Block	160 0 0	.. .. .	.. .. .
Wairua to Sandy Bay	10 4 0	.. .. .	.. .. .
Wairua to Helena Bay	92 5 6	.. .. .	237 12 5
Whangarei through Taheke	771 11 10	.. .. .	56 15 0
Tangihua No. 3	617 16 7	.. .. .	.. .. .
Okaihū to Victoria Valley	161 18 0	1,786 19 9	676 11 4
Waikato to Block XVI, Awaroa	4 15 0	.. .. .	.. .. .
Tauranga to Te Puke and Matata	229 19 9	110 0 0	.. .. .
Opotiki to Ormond	1,230 0 3	1,920 9 3	989 19 7
Te Aroha Block .. .. .	.. .. .	223 13 5	87 10 0
Ruakituri Block	128 6 2	.. .. .	.. .. .
Ormond to Waiapu .. .. .	.. .. .	.. .. .	13 14 0
Gisborne to Waimata	1,443 0 0	557 0 0	.. .. .
Gisborne to Wairoa	1,641 14 1	3,062 9 8	1,385 3 8
Taupo, <i>via</i> Rotoaira and Murimotu, to West Coast	1,869 12 6	1,989 18 11	3,405 3 2
Tologa Bay to Arakihi .. .. .	.. .. .	1,000 0 0	974 0 9
Kohukohu to Rahutapu	28 7 6	200 0 0	191 11 6
Whangaroa to Kahuru	1,000 8 0	156 4 5	925 12 7
Miscellaneous	2,851 6 4	493 15 4	1,641 12 2
Warerenga Road	34 5 0	347 5 3	169 7 10
Waimamaku Bridge	4 6 6	602 2 3	.. .. .
Awaroa Swamp, drains and roads	262 10 0	110 5 6	81 7 0
Paparoa to Waikiekie	3 10 0	156 8 9	326 10 10
Otamarakau Bridge	9 4 6	369 14 6	.. .. .
Ormond to Waiapu	3,295 19 6	2,000 0 0	.. .. .
Hamilton-Whatawhata Drain .. .. .	.. .. .	.. .. .	137 18 0
Churchill Punt .. .. .	.. .. .	6 8 6	142 15 8
Otonga Bridge	94 5 3	130 19 0	.. .. .
Lower Waihou Road .. .. .	.. .. .	.. .. .	206 12 9
Otama to Deeds .. .. .	.. .. .	.. .. .	300 0 0
Waihou through Komata .. .. .	.. .. .	.. .. .	80 13 0
Kawhia to Waipa .. .. .	.. .. .	1,897 4 0	535 16 0
Rotorua-Galatea Road .. .. .	.. .. .	565 7 6	2,502 10 8
Galatea to Tekapu, <i>via</i> Waikaremoana .. .. .	.. .. .	1,508 12 0	339 11 9
Alexandra to Hikurangi .. .. .	.. .. .	652 13 2	689 2 1
Wangaro to Akatea .. .. .	.. .. .	.. .. .	222 3 4
Akaaka Swamp .. .. .	.. .. .	150 0 0	446 5 2
Draining Tatararaki .. .. .	.. .. .	75 0 0	125 0 0
Mangapai to Mareretu .. .. .	.. .. .	.. .. .	37 10 4
Puriri to Tairoa .. .. .	.. .. .	.. .. .	163 4 0
Whaingaroa to Waitetuna .. .. .	.. .. .	.. .. .	576 6 11
Mauku Bridge .. .. .	.. .. .	.. .. .	36 0 0
Huka Falls .. .. .	.. .. .	.. .. .	630 4 11
Cabbage Bay to Cape Colville .. .. .	.. .. .	200 0 0	150 0 0
Matawhero to Whangape .. .. .	.. .. .	.. .. .	11 8 0
Alexandria to Kawhia	3,442 18 3	665 11 6	519 6 8
Totals	19,803 0 0	20,938 2 8	19,055 1 1
HAWKE'S BAY.			
Maharahara Block	611 9 10	1,514 12 3	84 0 0
Victoria and Bush Mills Settlements	432 9 6	367 10 6	.. .. .
Tautane Reserve	236 1 5	4,694 14 9	2,443 13 10
Wairoa to Rotokakarangu .. .. .	.. .. .	268 14 7	1,204 5 0
Umutaoroa Block	386 8	1,491 9 4	210 18 0
Makaretu .. .. .	.. .. .	135 16 0	1,279 11 7
Miscellaneous	286 11 3	99 12 4	57 17 3
Te Ohu .. .. .	.. .. .	.. .. .	434 8 10
Totals	1,953 0 0	8,572 9 9	5,714 14 6
TARANAKI.			
Continuous Reserve	438 8 7	.. .. .	.. .. .
Kahouri Bridge .. .. .	.. .. .	600 0 0	.. .. .
Tariki Road .. .. .	.. .. .	1,149 6 3	.. .. .
Eltham and branch roads, Waimate Plains	3,022 17 9	2,398 9 7	3,835 3 7
Native Trust blocks	80 0 0	1,093 6 3	1,000 0 0
Ironsand blocks	153 18 10	225 4 8	89 16 8
Pukearuhe to Mokau	464 14 10	264 10 0	495 7 0
Bridge on Stratford-Opunake Road .. .. .	.. .. .	.. .. .	376 19 5
Inglewood to Waitara .. .. .	.. .. .	61 12 0	1,625 9 4
Bush land inland of Patea .. .. .	.. .. .	.. .. .	150 0 0
Egmont Road .. .. .	.. .. .	.. .. .	291 1 5
Totals	4,160 0 0	5,792 8 9	7,863 17 5

STATEMENT OF EXPENDITURE in the FORMATION of ROADS to OPEN UP LANDS for SALE, &c.—
continued.

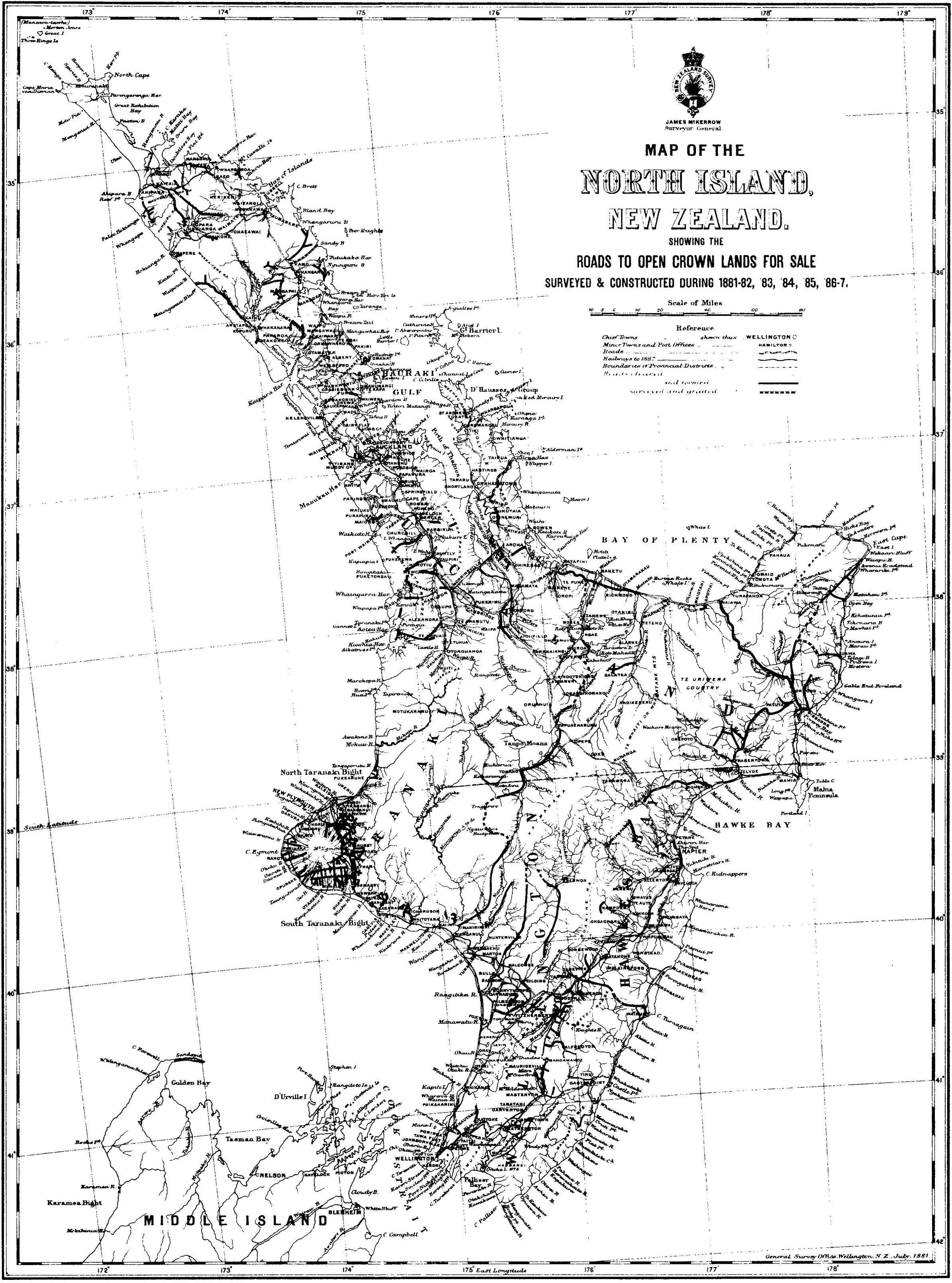
	1884-85.	1885-86.	1886-87.
WELLINGTON.			
Otamakapua and Waitapu	£ s. d. 904 18 9	£ s. d. 1,141 5 5	£ s. d. 610 4 9
East side of Pohangina River	202 1 6	514 17 7	153 4 11
Momahaki Block	200 0 0	390 10 0	200 0 0
Crown land, Mangahao and Mangatainoko .. .. .	..	90 19 2	3,476 12 11
Kaiwhata and Pahaoa .. .. .	..	..	500 0 0
Miscellaneous	203 14 1	180 12 3	..
Pahiatua and Mangaone	481 10 3	900 14 5	415 8 0
Tokomaru Block	141 5 6	18 17 11	36 15 3
Marton to Murimotu	523 14 3	500 0 0	400 0 0
Karewarewa Block	42 12 8	276 0 1	..
Paratieke	34 0 0	530 16 8	..
Rangitumau	175 3 0	322 19 5	617 12 2
Wanganui to Murimotu .. .. .	..	216 17 0	..
Otairi Block .. .. .	..	..	117 17 10
Kairanga Drain .. .. .	..	350 0 0	..
Makakahi Road .. .. .	..	16 13 0	373 7 4
Kimbolton Road extension .. .. .	..	..	603 4 11
Kimbolton Road to Oroua .. .. .	..	..	3 0 0
Waitapu Block .. .. .	..	..	63 2 3
Tiraumea Bridge .. .. .	..	..	8 12 6
Pahiatua Township .. .. .	..	..	18 4 2
Tutaekara Road .. .. .	..	..	1 10 0
South Pahiatua Road .. .. .	..	..	272 2 5
South Mangaone Road .. .. .	..	..	214 7 4
Maungakaretu .. .. .	..	..	254 13 9
Totals	2,909 0 0	5,451 2 11	8,342 0 6
NELSON.			
Ahaura to Kopara and Amuri .. .. .	..	..	100 0 0
Brooklyn Valley Road .. .. .	..	175 0 0	3 6 6
Karamea to Mokihinui .. .. .	..	250 0 0	53 8 10
Miscellaneous	440 2 10	204 14 5	284 0 0
Oronoko to Rosedale	99 3 9	..	..
Takaka to Anatoki and Collingwood	825 12 11	2,869 14 2	1,331 12 10
Tadmor Road	598 0 6	295 1 0	1,440 4 9
Maruia to Amuri .. .. .	..	940 6 7	447 9 0
Ahaura (Mason's) to Haupiri .. .. .	..	..	293 15 1
Pigeon Valley to Motueka .. .. .	..	..	406 0 0
Pretty Bridge Valley .. .. .	..	..	150 16 2
Grey Valley, <i>via</i> Clarke to Maruia .. .. .	..	..	100 0 0
Totals	1,963 0 0	4,734 16 2	4,610 13 2
MARLBOROUGH.			
Awatere Valley Road	378 17 6	..	..
WESTLAND.			
Kumara to Beach .. .. .	..	1,000 0 0	..
Moeraki Crossing to Otumutu	3 15 0	1,507 3 5	..
Mahitahi to Haast	446 19 6	..	..
Mapourika to Gillespie's	24 10 0	..	..
Miscellaneous	299 15 6	..	..
Teremakau to Bell Hill Road .. .. .	..	..	1,484 11 0
Waikukupa to Cook's River Flat .. .. .	..	..	607 15 0
Gillespie's to Cook's River Flat .. .. .	..	..	616 5 0
Cascade Valley Road .. .. .	..	..	1,583 6 8
Pounamu to Teremakau .. .. .	..	..	302 15 0
Totals	774 0 0	2,507 3 5	4,594 12 8
CANTERBURY.			
To Upper Ashley over Kuku Pass	1,300 0 0	200 0 0	300 0 0
Miscellaneous	199 0 0	109 12 0	42 10 0
Irrigation-works, Eyre and Waimakariri	2,076 0 0	250 0 0	150 0 0
Oxford Bush to Upper Ashley	1,900 0 0	600 0 0	..
To village and deferred-payment blocks	83 0 0	150 0 0	..
Blackhills Road along Hurunui	220 0 0	250 0 0	500 0 0
Road to Mount Cook .. .. .	..	1,000 0 0	200 0 0
Waihao to Hakateramea .. .. .	..	111 18 4	687 2 9
Blackford Road	129 12 0	170 5 0	..
Mount Grey Downs .. .. .	..	..	150 0 0
Glentui Road .. .. .	..	..	499 19 10
Deferred-payment lands, Teviotdale	407 8 0	..	..
Totals	6,315 0 0	2,841 15 4	2,529 12 7

STATEMENT of EXPENDITURE in the FORMATION of ROADS to OPEN UP LANDS for SALE, &c.—
continued.

	1884-85.	1885-86.	1886-87.
OTAGO.			
Lauder Block	£ s. d.	£ s. d.	£ s. d.
Upper Clutha Blocks .. .. .	..	800 0 0	204 0 0
Pembroke to Matukituki .. .. .	..	161 10 0	115 18 0
Education reserves .. .. .	..	..	1,720 11 0
Waikaka to Pyramid	1,586 18 0	..	..
Pyramid Bridge to Waikaia .. .. .	..	200 0 0	..
Waikaia Bush to Clutha Valley .. .. .	..	319 5 0	300 0 0
Beaumont to Miller's Flat	2,000 0 0	..	500 0 0
Pyramid Bridge	337 0 0	1,490 8 5	798 4 11
Miscellaneous .. .. .	..	765 4 4	..
Through Runs 177 and 257	720 0 10	1,098 13 4	250 0 0
Glenorchy up Rees and Dart .. .. .	..	3,002 0 0	508 0 0
Wynndham, <i>via</i> Mimiha to Otarara	881 8 5	2,027 2 4	5 9 0
Block II., Blackstone .. .. .	..	523 18 2	476 0 0
Tapanui Railway to Run 140	145 2 3	..	200 0 0
Taieri Lake, Block XV., Maniototo .. .. .	..	..	152 5 6
Taieri Bridge to Nenthorn Bridge .. .. .	..	175 0 0	..
Otago and Southland runs	219 10 6	..	..
Ida Valley .. .. .	..	..	250 0 0
Kurow Run .. .. .	..	..	927 13 8
Taieri River Road .. .. .	..	..	200 0 0
Hummockside .. .. .	..	..	260 0 0
Run 106 .. .. .	..	..	148 7 3
Silverpeak, &c. .. .. .	..	..	100 0 0
Glenoamaru and Owake .. .. .	..	..	300 0 0
Waikaka to Wendon and Groenvale .. .. .	..	..	381 1 8
Wendon District .. .. .	..	100 0 0	500 0 0
Totals	5,890 0 0	10,563 1 7	8,297 11 0
SOUTHLAND.			
Waimatuku Bush .. .. .	..	..	437 0 0
Blackmount to deferred-payment land .. .. .	..	..	350 0 0
Bush land, Makarewa	195 13 4	80 0 0	70 0 0
Branch Road to Forest Hill	207 0 0	..	..
Otatara Bush	291 14 1	..	500 0 0
West's to Mokohua .. .. .	..	..	100 0 0
Seaward Moss to Awarua Bay .. .. .	..	..	500 0 0
Hedgehope Road .. .. .	..	..	90 0 0
Half-moon Bay, Stewart Island .. .. .	..	..	230 12 0
Seaward Forest and to coast	100 0 0	750 0 0	950 0 0
Forest Hill Tramway	3,405 12 7	1,573 11 5	728 10 4
Totals	4,200 0 0	2,403 11 5	3,956 2 4
SUMMARY.			
Auckland	19,803 0 0	20,938 2 8	19,055 1 1
Hawke's Bay	1,953 0 0	8,572 9 9	5,714 14 6
Taranaki	4,160 0 0	5,792 8 9	7,863 17 5
Wellington	2,909 0 0	5,451 2 11	8,342 0 6
Nelson	1,963 0 0	4,734 16 2	4,610 13 2
Marlborough	378 17 6	..	..
Westland	774 0 0	2,507 3 5	4,594 12 8
Canterbury	6,315 0 0	2,841 15 4	2,529 12 7
Otago	5,890 0 0	10,563 1 7	8,297 11 0
Southland	4,200 0 0	2,403 11 5	3,956 2 4
Totals	48,345 17 6	63,804 12 0	64,964 5 3

[Approximate Cost of Paper.—Preparation, nil; printing (1,875 copies), £47 9s. 0d.]

By Authority: GEORGE DIDSBURY, Government Printer, Wellington.—1887.



MAP OF THE NORTH ISLAND, NEW ZEALAND.

SHOWING THE
ROADS TO OPEN CROWN LANDS FOR SALE
SURVEYED & CONSTRUCTED DURING 1881-82, 83, 84, 85, 86-7.



Reference

Chief Towns	shown thus	WELLINGTON
Minor Towns and Post Offices	shown thus	HAMILTON
Roads	shown thus	
Railways to 1887	shown thus	
Boundaries of Provincial Districts	shown thus	
Rivers	shown thus	
and formed	shown thus	
surveyed and graded	shown thus	



JAMES MCKERROW
Surveyor General

MAP OF THE MIDDLE ISLAND, NEW ZEALAND.

Scale of Miles

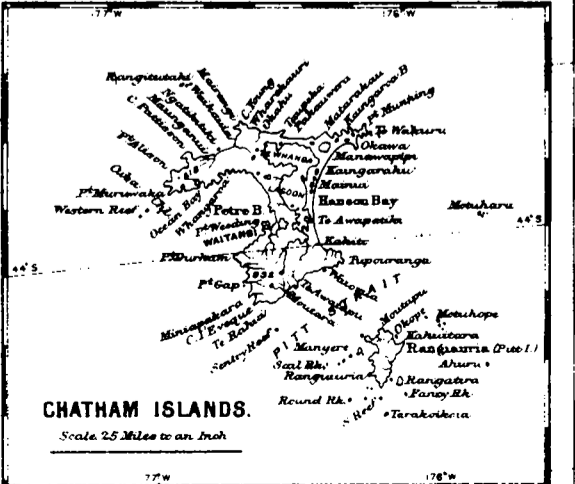
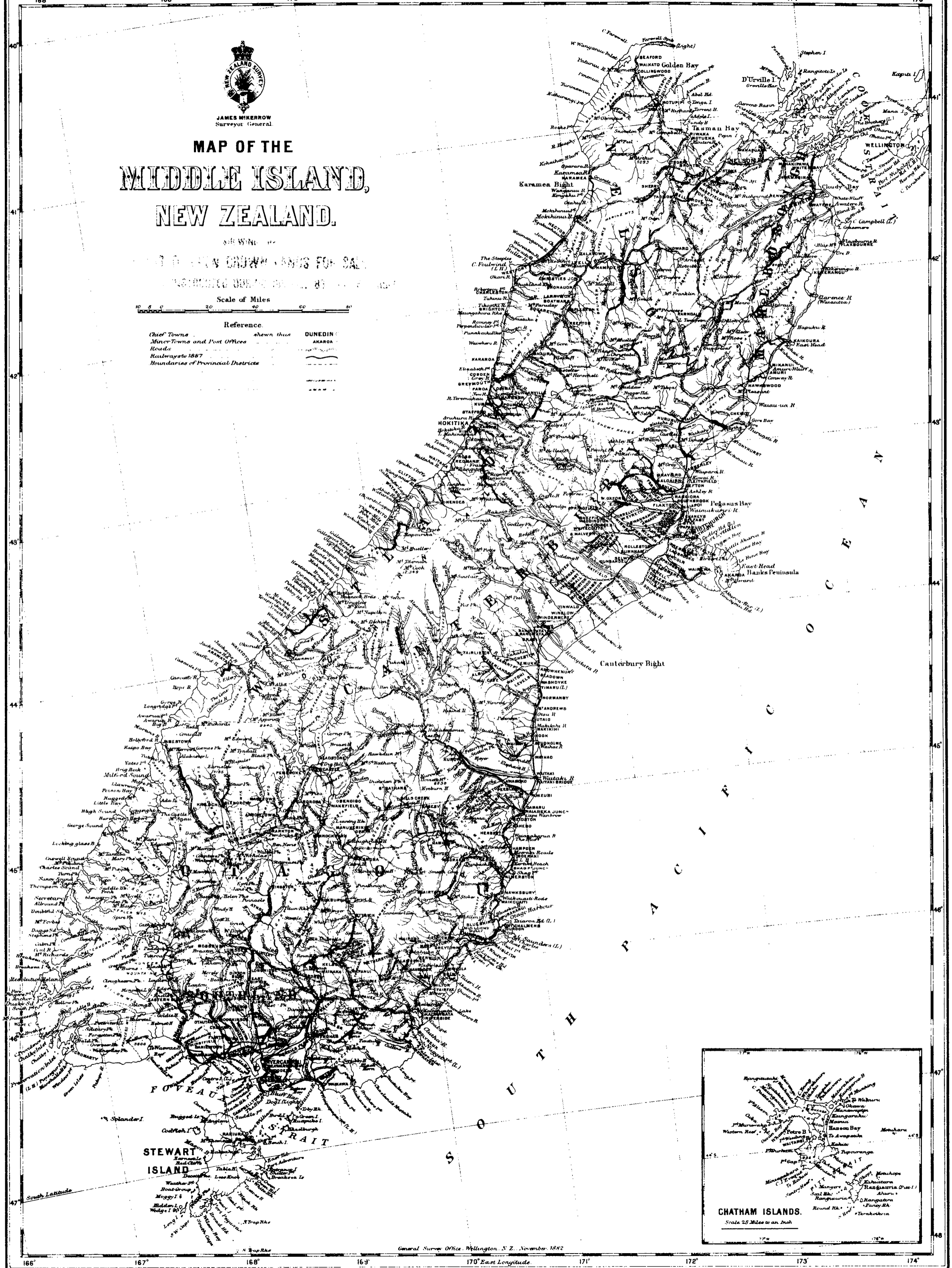
Scale of Miles
0 20 40 60

Scale of Miles

0 20 40 60

Reference

Chief Towns	shown thus	DUNEDIN
Minor Towns and Post Offices	shown thus	AKAROA
Roads	shown thus	
Railways 1887	shown thus	
Boundaries of Provincial Districts	shown thus	





JAMES HARRISON
LITHOGRAPHER

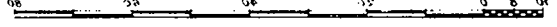
MAP OF THE MIDDLE ISLAND NEW ZEALAND

SHOWING THE

ROADS TO THE CROWN LANDS FOR SALE

AS OPENED & FORWARDED DURING 1881-82, 83, 84, 85, 86, 87

Scale of Miles



Reference

- Green Towns and Post Offices
- Black Towns and Post Offices
- Red Towns and Post Offices
- Blue Towns and Post Offices
- Orange Towns and Post Offices
- Yellow Towns and Post Offices
- Grey Towns and Post Offices
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- Yellow Towns and Post Offices
- Grey Towns and Post Offices
- White Towns and Post Offices

