

1879.

NEW ZEALAND.

SURVEYS OF NEW ZEALAND.

(REPORT FOR, 1878-9.)

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

TO THE HON. THE MINISTER FOR LANDS.

SIR,—

Wellington, July 31st, 1879.

I have the honor of informing you that during the twelve months ending 30th June, 1879, the results of survey work executed have been as follows, of which a more detailed account will be found in appendix No. 13. :—

NATURE OF WORK.	AREA.	RATE PER ACRE.			COST.		
		£	s.	d.	£	s.	d.
	Acres.						
Meridional circuit and major triangulation ...	958,852	0	0	61	2,058	8	4
Minor triangulation without topography ...	1,516,756	0	0	1	6,308	17	2
Topographical and minor trigonometrical survey ...	1,742,072	0	0	1·6	11,656	5	8
Rural and suburban section survey (average size of sections being 152 acres ...)	1,090,399	0	1	1½	55,139	15	7
Town section survey (5677 allotments at 11/3 per allt.)	3,043	1	1	0	3,194	19	3
Native Land Court surveys ...	59,410	0	0	3·06	759	10	7
Native Land Purchase surveys ...	178,258	0	0	6½	4,863	10	11
Gold mining surveys ...	2,385	1	4	5	2,909	8	10
Road surveys ...	618 miles	£11 3s. 6d. per mile.			6,904	19	3
Miscellaneous surveys, reports on land proposed to be opened for sale, detention by Native opposition, &c.					8,651	8	2

The map, showing the extension of the various processes of survey in the colony, annexed to this report, will give a better idea than any words can express of the present state of operations, and the manner of their affecting the various settlements. It will also show the cause of the higher cost of surveying in certain districts over others. Westland and Nelson, of all others, present the most difficult problem to meet, and where applications are most remote, inaccessible, and unprofitable, there the survey is most costly. This anomaly has also occurred in Nelson,—which of all parts of New Zealand opposes most rugged physical geography to all approved systems of survey,—that the land laws (as pointed out in the Chief Surveyor's report) have been such as to make it hopeless even to attempt to bring land applications into a recordable state. The difficulty has lately been somewhat ameliorated, but I would be wrong in not advising that land applications be yet put under some rule or method. Free selection in the accessible Canterbury plains, and in the impenetrable Nelson mountains are two different things.

As it is now over three years since the Government were pleased to order me to organise a uniform system of survey for the whole colony, it would seem incumbent on me to furnish a statement of the operations in a more full manner than usual. I have therefore appended extracts of reports from the several officers in charge of the various branches and districts, in the hope that by my doing so it will be found to be the most satisfactory manner of attaining better elucidation.

The standard branch of the survey on which so much depends, has naturally been the one which has caused most anxiety to me as no settlement surveys can or could proceed correctly without the control of its operations. This has been immediately under Mr. James McKerrow, Assistant-Surveyor-General, either in the capacity of an active actual observer, or as supervisor. It is satisfactory to learn from his report (see Appendix I.), that the extension of the standard bearings may be said to be completed for a time. He adds, "the extension of standard bearings has enabled triangulation and sectional surveys to proceed on true meridian, in outlying districts wherever required, without waiting for the triangulation to be brought up from settled districts; and with accuracy and freedom from any subsequent corrections or adaptations of bearings." The significance of this result I can appreciate, as it has enabled the Government to place its actual surveys in all parts of the colony on a permanent and solid

basis; the warmest acknowledgements are therefore due to Mr. McKerrow and his assistants for their accomplishment of this valuable service. The maps of the geodesical meridional circuits annexed will show the whole scheme of these operations.

The settlement or sectional portion of the Survey Department being conducted under the immediate supervision of the chief surveyors, their reports will be found in Appendix No. 2 to 11. The remarks of these gentlemen are invaluable, inasmuch as on them rests the burden of actually and immediately dealing with the problems of locating the settlers, land purchasers, and immigrants on their holdings. Their remarks on many of the practical questions, which interest the Government and people, bear the greatest weight, as by their experience they are enabled to competently judge and advise. As the responsibilities accepted by Messrs. Smith and Baker, in their charge of the Auckland and Canterbury districts, were more than ordinarily heavy, it is due to them to bring to your notice the efficient, and highly satisfactory manner, in which they have met and overcome their difficulties. The burden on each has been of a different nature, yet the charge has been so equal, that in soliciting the approval of the Government of their labours, both must be mentioned simultaneously.

On reference to the General Report on the surveys of New Zealand, dated 7th December, 1876, it will be seen that Auckland district, was, in its Crown Lands branch, burdened with 2,500,000 acres, and in its Native Lands branch 7,502,966 acres of unproven sectional survey, and though in the Native Lands branch it possessed 9,647,390 acres of excellent major triangulation, yet it had a mere nominal quantity of that process—minor triangulation—which immediately controls, and is essential to sectional survey (60,000 acres). Since the date of his appointment, Mr. Smith has assiduously given his energies to the introduction of the Governmental new methods of survey and office record, so that his department is now conducted in accordance therewith, all his actual surveys being placed on true meridian, and his plans arranged uniformly for easy and intelligible reference. As Deputy Inspector of Native Surveys, in proximity to the Native Lands Court, Mr. Smith has had extra responsibility placed on him, and which he has undertaken in a most hearty and accommodating spirit.

On the same date as above quoted, 7th December, 1876, Canterbury district was burdened with 2,014,696 acres of unproven sectional survey, 2,008,000 acres of unproven minor triangulation, possessing only 992,000 of the latter reliable; but in addition to this the claims for immediate survey of land purchases were unprecedented in the colony. Thus in October, 1877, the arrears amounted to 718,880 acres; in June, 1878, to 765,934 acres; in October, 1878, to 890,000 acres, which in June, 1879, are reduced to 552,512 acres. In Mr. Baker's subsequent report in order to include certain public reserves, this figure is increased to 600,819 acres; but as all the preparatory processes now cover the ground, the coming season will bring the arrears down to very workable and low limits. While I mention specially these two chief surveyors, I must also record the value I set on the cordial co-operation of all other officers of the same standing. Through their exertions the system ordered by the Government is now in full operation in all parts of the colony. It will be seen by their reports that the department is keeping well up with the public demand on its services.

At the Head Office, Wellington, Mr. Alexander Barron, has, by his attention and thoughtfulness, given most hearty and efficient help in conducting the routine of duty, in the construction of general, district, and county maps, in the arrangement of records, in calculations, examination of proof maps, lithographs, or photo-lithographs, in the compilation of returns, and otherwise in promoting the adaptation of the Government system to the wants of the public.

In the measures for the coming season I propose the following:—The actual expenditure of last season was £148,984 0s. 1d., which is, however, brought down by refunds, payments on account of work done, and other credits to £143,958 16s. 4d., of which £19,848 1s. 1d. has been expended in arrear surveys in Canterbury and Hawke's Bay, and £2211 9s. 7d., on the photo-lithographic establishment. What is proposed for this coming season is £151,906; but of this £132,934 only will come out of revenue, £18,971 being provided for out of the funds retained for arrears of surveys in Canterbury and Hawke's Bay. The proposed expenditure also includes £2,790, the cost of the lithographic establishment, £2,000 of which being spent in the work of other departments should be credited to the Survey Department. This brings the literal expenditure down to £130,560.

The sectional work in hand, which most interests settlers, is by the the last monthly returns, as follows:—

Auckland—Crown Lands, 80,535 acres; Native Lands, 598,800. Taranaki—Crown Lands, 16,900; Native Lands, 70,000. Hawke's Bay—Crown Lands, 120,000; Native Land, 60,000. Wellington—Crown Lands, 157,000; Native Lands, 349,000. Nelson—Crown Lands, 130,434. Marlborough—Crown Lands, 330. Canterbury—Crown Lands, 554,512. Westland—Crown Lands, 11,900. Otago—Crown Lands, 53,529. Southland—Crown Lands, 108,933.

Appendix No. 14, shows a money estimate of the work of the department devoted to several branches of the public service. Settlement survey, including Crown and Native Lands, will be seen to include the largest portion, but the Land Transfer Office involves more responsibility than is shown in the figures. The cost of the surveys for the Land Transfer Office does not come into our returns, as they are executed by private authorised surveyors at the expense of the land owners. In so far as supervision and office record, however, the labour involved is the same as in settlement survey, and this will increase annually, till in due time it becomes the most important. In this view, and considering the responsibilities that Government take on themselves in relation to land titles registered under the Land Transfer Act, I have directed, and yet propose to direct as opportunity occurs, officers in the several districts to triangulate and topographically survey all those areas covered by unproved sectional work, of which, when first taking office, I found 14,375,662 acres in the colony (General Report, 7th December, 1876). By this means it is hoped, that without sensible burden to the public revenue, we will be able gradually to reconstruct the doubtful on the present recognised system, and thus amalgamate old work with the new. By so doing the danger to Government in guaranteeing titles will not only be greatly decreased in the meantime, but will be ultimately got rid of; *i.e.* in as far as human effort and sound practice can do so.

As Mr. McKerrow has reported the standard operations to be complete for the time being, it here

becomes me to allude to the proposed astronomical observations about to be entered on, for which this condition gives opportunity; and here, I may remark, that the basis of this colonial survey is astronomical, not geodetic, for reasons which I have already given, resting mainly on the fact that the exigencies of the public and settlers require it (General Report, 7th December, 1876, page 18). It will be seen in reference to the map of meridional circuits appended, that there are twenty-eight initial points of survey. These, with some exceptions are, for the time being, placed in the general maps of the colony by means of the Admiralty determinations.

The work of independent determination will have to be commenced at the Survey Observatory situated on Mount Cook, Wellington City, for latitude and longitude, from whence differences of latitude and longitude of the other stations will be ascertained, either by astronomical observations, and galvanic signals, or by triangulation, as may be found most fitting.

For the purpose of these observations, powerful instruments, with the most modern improvements, have been purchased in London, and all of which have arrived, excepting the clocks, but which we expect at an early date. When at home, in selecting chronographs, I found great difficulty. I examined those of the Greenwich and several other leading observatories, but found all very expensive and few satisfactory. I therefore applied to Mr. James Simms, of the eminent firm of Messrs Troughton and Simms. After mature consideration that gentleman informed me that it would take him more time than he could spare to design an instrument, but he showed me a registering sheet by Mr. Ellery of the Melbourne Observatory, which was beyond all comparison the best I had seen. I therefore determined not to purchase this instrument in England, but as I intended to return by Melbourne, to ask Mr. Ellery's kind offices there. This in due course I did, and I have great pleasure in reporting that not only did Mr. Ellery most handsomely volunteer his assistance, but he has since sent us a beautifully constructed instrument that will serve our purpose most admirably. For this assistance our best thanks are due.

On the completion or progress of the contemplated astronomical observations, then maps of the Colony or parts thereof can be constructed, and for which the department has now abundant materials.

In conclusion, I may remark that during my leave of absence to Europe, I was not unmindful of the interests of the department. By the good offices of Sir Julius Vogel, Agent-General for the Colony, I obtained access to the Greenwich Observatory, where as already reported (*Gazette* No. 46, May 20th, 1878,) the Astronomer Royal, Sir George Airey furnished, me with certain corrected lunar star distances in connection with local observations executed in the service. By the same good offices I visited the head quarters of the ordnance of survey Great Britain, located in Southampton, when I had an opportunity of examining the several processes interesting to the Colonial Surveyor, in the standard and property branches of field work, as well as in the record and publication of office work. In the principal portion of my enquiries, I was greatly indebted to the courtesy of Colonel Clarke, C.B., R.E., whose scientific and thoroughly apt acquaintance with all the higher processes of the art of geodetic survey is well-known.

During my stay in England I made several visits to London, for the selection of instruments for the Survey Department, and more particularly for those about to be used in the astronomical branches, nor in the not less useful though ordinary branches was my personal visit without advantage. In several of the districts of the Colony, I have had it most apparently brought home to me that the ordinary instruments employed in plain survey are not available. These districts are specially in Westland, Nelson, and a large portion of the interior of the North Island. Here the face of the country is so rugged or over-grown that neither triangulation nor traverse are applicable under very heavy cost. Hence the advantage of using an instrument that would ascertain distances without these methods. This I anticipated would be served by the micrometer telescope. On consultation with Mr. Simms, an instrument was decided on, four of which have been perfected, and after due test are now in use, or about to be used, here. The great difficulty in Colonial survey is rigid connection of parts or of isolated sections, and with this instrument, I hold that no Chief Surveyor can be excused after this, of doing his work without connection, however dispersive the land survey applications are.

For section survey in similar country, Mr. Simms brought to my notice an instrument called the "Tacheometer," much used by the Government of Italy. Four of these also were ordered, and have just arrived. For crossing gullies or following along hill ranges, this instrument, I am of opinion, will be invaluable.

The large transit instrument for the observatory of Mount Cook I had fitted, after trial of its success, with a reversing apparatus, which avoids the usual danger of accidents by carriage in the arms of the observer.

On our way out, as our vessel stayed three days at Cape Town, two days at Melbourne, and three days at Sydney, through the kindness of the officers in charge of the general Survey Departments, I had the opportunity of examining into the systems of the Cape Colony and the Colonies of Victoria and New South Wales.

Previous to this, in passing through the United States and Canada, though I did not visit any of the survey offices, yet I met officers connected with the departments, from whom I had illustrations of their systems given on the spot.

Further, I took the advantage of proximity to ask for working plans of actual surveys from the head office of Canada, at Ottawa; and which were kindly forwarded to me at London by Colonel Dennis.

I may therefore say, that though my leave of absence was given purely on personal grounds, I obtained through it extensive information of great official interest. The result of that information would be too technical to dilate upon here. But I may shortly state that in the vast territories being over-run and occupied by colonists of the Anglo-Saxon race, as there is great diversity of physical geography, and infinite variety in the wants of the people, there is no general co-incidence of land-laws nor complete congruity of survey systems, but often wide opposition of principle.

If, again, we compare the Colonial systems with the surveys of Great Britain, and its tropical Crown possessions, the contrast is yet more palpable.

In the United States, and in the British Colonies of temperate zones, this fact comes prominently to

light, viz., that the successful methods have been those, which, without abandoning good practice, whose cardinal aim is to immediately meet the wants of settlers. Hence in all the great colonizing areas, practical and rapid methods of land "parcelling," or allotment are enacted, either by law or by departmental regulation, and where this is not the case, a condition I had an opportunity of studying in several of the colonies, wherein the more abstruse and elaborate primary processes of old European countries were partially approximated to, the effect was *nil* as regarded the actual survey, and positively injurious as affecting the settlement of the people, by its retarding influence.

In enunciating this opinion I must reiterate the expression *approximated to*, for as a basis to colonial survey, primary geodetic operations, in the home scientific sense, have nowhere been put in practice.

I have, &c.,

J. T. THOMSON,
Surveyor-General.



INDEX
TO THE STATE OF THE
PUBLIC SURVEYS
IN
NEW ZEALAND

June 30th 1879



MIDDLE ISLAND



REFERENCE

Standard Survey	..... shewn thus	
Minor Triangulation	.....
Section Survey under check	.....
..... built	.....



J.J. Thomson
Surveyor General

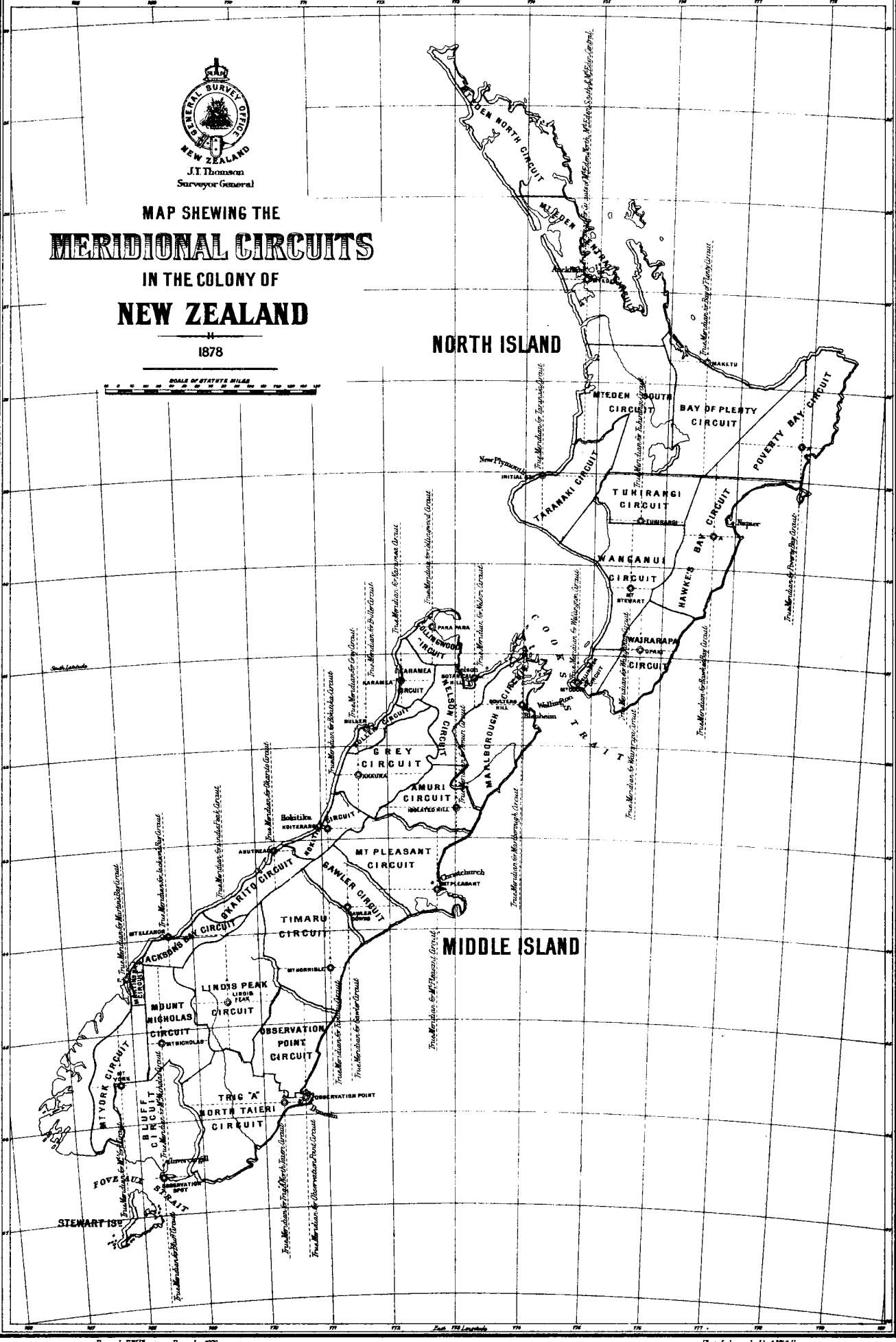
MAP SHEWING THE MERIDIONAL CIRCUITS IN THE COLONY OF NEW ZEALAND

1878

SCALE OF STATUTE MILES
0 10 20 30 40 50 60 70 80 90 100

NORTH ISLAND

MIDDLE ISLAND



APPENDIX.

No. 1.

STANDARD SURVEY.

To J. T. THOMSON, Esq., SURVEYOR-GENERAL.

SIR,

General Survey Office, Wellington, 23rd July, 1879.

I have the honour to report on the operations of the Standard Surveyors during the twelve months ended 30th June, and generally on the subject of Standard Survey.

Mr. J. W. A. Marchant extended a line of bearings from the station, near Burke's Pass, on through the plains of the Tekapo and Pukaki Lakes to a close on the Geodesical Station Cloud Hill, Ahuriri survey district, Lindis Peak meridian. The difference between the observed and computed convergence of the Timaru and Lindis Peak meridians is 16".

Mr. Marchant also laid down a standard chain length at Government Buildings, Wellington, and by means of steel tapes, standardised to this distance, the standards at Auckland, Nelson, Christchurch, and Dunedin, have been compared, with the result that Auckland, Wellington, and Christchurch are practically the same in length, while the chain lengths at Dunedin and Nelson are each very nearly one-eighth ($\frac{1}{8}$) of an inch longer. These standards were all laid down at the temperature of 62° Fah. but by different persons and from different brass scales. A comparison of several scales has revealed minute, yet sensible differences in their lengths. The four feet brass scale at the head office, and the 66 feet measured from it at Government Buildings, will be assumed as the standards for the Colony, and all other survey standards will in future be expressed in terms of them.

Mr. C. W. Adams began and completed the standard survey of the city of Christchurch, and of the suburban district lying to the west, and comprehended between the Lincoln and Papanui Roads. In Christchurch, lines were run along the street lines near the kerbing and parallel to the building lines, and the intersections are marked at the corners of streets with stone blocks in a manner similar to surveys undertaken in Dunedin and Invercargill some years ago. The original survey of Christchurch had been ranged accurately, hence it became practicable, not only to have the lines parallel to the true building lines, but also rectangular. The finding of lines to satisfy these conditions necessarily occupied more time than the running of arbitrary lines would. But the result is well worthy the trouble, as the arrangement will greatly simplify all future reference to the lines; and as they have been measured with the same care as base lines of trig. surveys, and closed on each other perfectly, there is no reason why the position of every property that is brought under the Land Transfer Act should not be certainly known within an inch or two. The original blocks were laid off on the ground 1111 by 502 links, but as they were Crown granted 1100 by 500 it was impossible in making sub-divisions, to get the aggregate distances to agree with the total as Crown granted. Now that the facts are laid bare, there need be no further perplexity. With very ordinary care all risk of guaranteeing titles to encroachments should cease.

A similar survey is in progress for the City of Auckland, where it is especially necessary, on account of original plans having been destroyed by fire, and the impossibility of compiling a plan from deeds extant. These town standard surveys may reveal discrepancies in recognised boundaries, but they *do not affect to alter or correct them*. Their sole object is to afford a sure basis of reference for the Land Transfer surveys. The trigonometrical survey becomes of little account as a basis for checking surveys in a town as the streets get built up. Besides, the trig. points are too far between, and would never do as starting and closing points for surveys of frontages, that may be worth a hundred or more pounds per foot. Each town standard survey is of course connected with the trig. survey, and the bearings of lines are all on true meridian.

In Taranaki, the meridian line, run through the forest from Waitara to the Waimate Plains, was completed early in the season. It is forty-two miles long, and was run with very great care and accuracy. Mr. Humphries determined the true meridian at its south end astronomically, and on comparison with the line as marked on the ground, there was an almost perfect agreement, the discrepancy amounting to only 4". The instrument employed on this work is an excellent seven inch Transit Theodolite by Troughton and Simms. From the meridian line a perpendicular has been run for ten miles eastward into the forest. The natives have tampered with the marks on a portion of the meridian line, but to what extent is not yet known. An inland line of bearings run from hill-top to hill-top, which had to be cleared, has also been completed. The close in this case was not good being 1' 26" discrepant.

In Marlborough, Mr. A. D. Wilson has completed the field work of a major and minor triangulation from a measured base of over two miles in the Wairau Plains near Renwick. The chain of triangles extend from the initial station of meridional circuit, Goulter Hill, Wairau, up the Kaituna and Pelorus valleys to the crest of the hills overlooking Nelson. One or two triangles from the Nelson side will effect connection with the Messrs. Carkeek's triangulation, Waimea. Mr. Wilson is now engaged on the trig. and topographical plans of his work. The triangles cover 156,000 acres.

In Westland, Mr. J. G. Roberts has established standard bearings south from Ko-i-terangi to Abut Head. As this country is difficult to get about in, and there is no great urgency for standard bearings, a major triangulation with subsidiary stations is being carried on simultaneously.

The country south from Abut Head to Jackson's Bay, one or two of the interior valleys of Nelson, and the King country in the North Island are the only parts of the Colony remaining, over which it is desirable to extend standard bearings when there is opportunity.

The extension of standard bearings may therefore be said to be completed for a time.

Summarising the results of former seasons' work, there are twenty-eight meridional circuits, subdivided into survey districts, of as near as may be, 12½ miles square or 100,000 acres. Each survey

district has its initial station, on a line of standard bearing. To this station all surveys within the district are referred. The survey of each district is therefore complete in itself, and it can be trigonometrically and sectionally surveyed, settled, recorded, and Crown granted without regard to its geographical position, or what may be exterior to it. This arrangement in the field has its counterpart in the survey offices, where all survey plans relating to a district are kept in the same portfolio in the safe, and are at hand when wanted. The bearings and distances being derived from the same standards, the work throughout the various districts is homogeneous, and the surveys as they close on lines common, become the check and verification of each other.

The extension of standard bearings has enabled triangulation and sectional surveys to proceed in out-lying districts on true meridian, whenever required, without waiting for the triangulation to be brought up from the settled districts, and with accuracy and freedom from any subsequent corrections or adaptations of bearings. The exemplification of these remarks is to be found in the closures of minor triangulation surveys reported from time to time by the Chief Surveyor of Canterbury, and others.

I have, &c.

JAMES MCKERROW,
Assistant Surveyor-General.

No. 2.

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

AUCKLAND.

Survey Office, Auckland, July 11, 1879.

MAJOR TRIANGULATION.

There are only 140,292 acres of this completed during the year, and this principally by Mr. Barnard, in the mountainous country lying on the borders of the Poverty Bay circuit. It was undertaken in the interests of the Native Block surveys, which are gradually extending into the mountains.

MINOR TRIANGULATION.

Of this, there has been 540,292 acres completed, nearly all in small detached pieces, filling up the interstices of the major work, from which the lengths have invariably been derived. About two-thirds of the total area was undertaken in the interests of settlement surveys, the rest for Native Blocks and road connections.

TRIGONOMETRICAL AND TOPOGRAPHICAL SURVEYS.

These surveys have also been incidental to the requirements of other surveys, none having been undertaken expressly for the purpose of providing topographical sketch maps for selectors. I should be glad to give more attention to this branch, but hitherto the work of extending as fast as possible for connection purpose, to keep pace with the demand for section surveys has prevented it. The only survey of any extent is that by Mr. Cussen, undertaken to secure fixed points for the Aroha surveys.

RURAL AND SUBURBAN SECTION SURVEYS.

There is under this head a total of 115,618 acres in 473 sections, of this amount rather more than 5,500 acres may be classed as revision survey, undertaken in the definition of boundaries of lands sold and granted many years ago; but which have never been marked on the ground. Of the two contracts under this head, the larger one was for the subdivision of the Waiau District into large sections averaging 2,600 acres in size, to be sold as runs—for which purpose alone the country is fit. A very considerable portion of the total area has been in either isolated small sections or groups of sections, few in number, surveyed after application by selectors. The price per acre, though not high, is reduced by averaging the large run surveys with the small section surveys. The cost per acre of the latter class of survey is high—which is to be attributed to the difficulty and trouble experienced whenever the new surveys abut on to the old. Days are often lost by the surveyor before he can find a peg to start from, and generally, when found, it is not in the place indicated on the maps. The amount of discrepancies of a serious nature which are daily brought to light in the old surveys is startling, and leads to a great sense of insecurity in lands held under Crown Grant. Cases of double or overlapping grants, are often met with, but it is generally found that the old surveys give abundant measure, and it is lucky that this is so. Errors of a chain or more in boundaries of a mile or less are so common that they cease to cause remark.

The inefficient manner in which former surveys were marked on the ground is the great cause of trouble. As an instance of this, a surveyor engaged on the work of attempting to define boundaries of lands sold many years ago, was positively a fortnight searching the country before he could determine upon a point which he could depend on as being identical with the map.

Under the head of rural section surveys is also the item homestead surveys, they amount to 2,933 acres in 20 sections. These amounts are not entered into the totals as being paid for by private individuals.

TOWN SECTION SURVEYS.

There have been 214½ acres divided into 275 sections, of which 65 acres, containing 75 allotments, were surveyed for the Commissioners of Education Reserves, and 27 acres, in 10 allotments, a revision survey for the same Commissioners.

NATIVE LAND COURT SURVEYS.

These are blocks generally of large size, which the Native owners applied to have the cost of surveys advanced by Government under the "Native Land Act, 1873," and the expenditure on which is secured by lien on the lands themselves. The cost of these surveys is proving heavier each year. As the Maoris find their patrimony departing from them they are induced to contest every inch of land in the Courts, and to obstruct the surveyors in the prosecution of their work, as an assertion of title. This is daily shown at the Courts, where blocks of land which would have been passed formerly without any trouble are now disputed sometimes for weeks. A total area of 59,410 acres, in 26 blocks, was surveyed by the Department during the year, but this does not represent the whole quantity as surveyed for purposes of the Court. In addition there have been 82 blocks, containing 216,809 acres, surveyed by surveyors authorised in each instance by this office, but paid for by private individuals, the checking and computation of which forms an important part of the office work.

LAND PURCHASE SURVEYS.

Under this head is included the survey of blocks of land under negotiation for purchase by the Crown, and also the Native Reserves cut off the blocks by order of the Commissioners, these latter amount to 19,096 acres, in 25 sections. The cost of these surveys is always heavy on account of the time lost in attempting to reconcile the conflicting interests of those to whom they are awarded. The area of work on hand for the Land Purchase Department is very large, and is likely to be increased.

GOLD FIELDS SURVEYS

In this district are not numerous, and as far as the Department is concerned, are all undertaken by Mr. McLaren at the Thames, whose duties, however, as Mining Inspector do not admit of his doing much. The value of his work under this head for the past season he puts at £50.

ROAD SURVEYS.

The greater part of the 263 miles of road surveyed, has been in exercise of the rights of the Crown under the Native Land Act and Crown Grants Acts, and in lines to open up lands for settlement. The larger portion has been so done that the data for preparing specifications for contracts was obtained at the same time, the cost therefore is greater than under ordinary circumstances, in one case it amounted to £30 per mile in a very rough forest country, but an excellent line was obtained which is now in course of construction. One fact has been brought out strongly with respect to the survey of road lines in bush country during the past season, and that is, that where the roads are to be made immediately, it is a great mistake to make a scientific survey at the same time as that for engineering purposes. When the road has once been cleared, the proper traverse and pegging of it, can be made at a quarter the cost, and with more accuracy.

The issue of Circular No. 59 from the General Office, which makes it imperative that main roads shall be run to a grade of 1 in 15, and district roads to 1 in 10 has produced, and will produce, greater benefits to the public than anything on the subject that I am acquainted with. The manner in which the road lines, as a rule, have been laid out in this part of the colony hitherto, is simply disgraceful to the profession, and is now proving a constant source of expense to the Highway Boards, who have in, innumerable cases, to abandon the surveyors roads and purchase fresh lines through private property. A "surveyors road" is now a bye word and a reproach. The cause of all this is not far to seek; it is contained in the fact that surveyors were invariably paid by the mile, at the same rate they received for boundary lines, and as a consequence, quantity rather than quality was the end sought. The result of this system of payment as an educating influence on the surveyors themselves, acting for a number of years, has had a most pernicious effect; for not one man in ten has any idea of what a road should be. There are a few exceptions, however, and I congratulate myself in having some gentlemen on the staff of this district whose works will compare favourably with any in the colony. Fairburn's Great North Road and Palmer's Raglan Whatawhata Road, surveyed and constructed under the supervision of those gentlemen, show what can be accomplished by skill properly directed, in difficult country.

The engineering work undertaken by the office during the past season has been considerable, but it is premature to speak of results until the contracts under weigh are completed. One principle has guided us in these works, which is, I believe, the right one, viz.: that whatever is done shall be done once for all, on the future permanent lines, so that however great the traffic may be, it will be only necessary to widen, not to alter, the roads. We are at the same time educating our young men in a system which will, I trust, prevent their own work from having the stigma attached of "surveyors' roads."

Of the other heads of field work in the accompanying returns, it is unnecessary to speak, more than to say that under "other work" is included the cost of inspection and occasional assistance to the Native Land Courts in subdivision surveys, supervision of contracts, &c.

Upon reviewing the work of the past season, there is nothing that calls for especial mention. The general character of the work is on the whole, better; and of a higher standard, though there have been some exceptions. In four cases have surveyors been obliged to do over again, at their own expense, work which upon being tested was found not to be up to the standard; and in one case I have accepted a group of surveys on a magnetic meridian, which were required at once by the Land Purchase Department, before the meridian could be carried up to them. I would mention as surveys of the highest character, the subdivision of Te Aroha by District Surveyor Cussen and assistants, which, by the aid of the new steel tapes, has been made to equal in accuracy the majority of town surveys.

The past period of two and a half years must be looked upon as one of education, in which an entirely new system of surveys has been introduced, and during which a large number of surveyors have had their ideas of surveying a good deal modified, and are beginning to appreciate accuracy and system for their own sakes. Those who cannot or will not learn, are getting gradually crowded out by young men who have nothing to unlearn. It was a serious undertaking to entirely alter the professional traditions of some forty or fifty men, and has entailed a large amount of wearying and incessant work, which could

only be accomplished by prolonging office hours to midnight. This is bearing fruit however, for it is now sufficient to instruct a surveyor *to do* a thing without showing him *how*.

A noticeable feature of the past half year has been the great extension of surveys for the Land Purchase Department, necessitating the employment of a number of surveyors outside the official staff. The surveys now going on are very extensive, and are likely to take some time to complete, if surveyors are subject to such delays as Mr. Clayton was in June, when the Natives forcibly stopped him and carried himself and party away to one of their villages for twelve days, until the Commissioner could arrange matters.

The surveys for the Land Transfer Branch partake of the same improvement as the others. The official instructions lately issued for the guidance of Licensed Surveyors are looked upon by the surveyors with whom I have conversed as a boon to them, more especially the clause which directs adherence to the marks on the ground rather than to the record of them, but, it seems to me, that one step further in this direction is required, and that is, that this important matter should be enforced by legal enactment. You, sir, are doubtless aware that there is at present a difficulty in carrying out this useful provision, inasmuch as the Land Registrar cannot grant certificates outside the Crown Grant.*

The office work of the year has been very heavy. The returns of the Chief Draughtsman show some of it, but it will be years before the chaos of maps can be reduced to order. The attempt in every case to replot the old work on the new block sheets has proved abortive. I am firmly convinced that it can never be done, excepting in some few cases. We content ourselves now with merely laying down the old work in pencil.

The only point in which I have as yet been unable to carry out the general instructions is that which directs that Record Maps, to show the operations of the Land Transfer Branch, shall be prepared. The want of connection between the Major Triangulation and the section work has hitherto prevented this, but as the new surveys come in, data for starting this work will gradually accumulate sufficiently to allow of its accomplishment—at all events partially. The preparation of Crown Grant Record Maps for the new districts is simple, and an attempt has been made to construct them for the old districts by laboriously compiling the information from the Registry Office. As soon as any are complete, I propose reducing them to 40, and transmitting them to the General Office for photo-lithographing.

Many of the old maps, from having been so many years rolled, now that they are folded and placed in the folios, show signs of wearing, wherever possible they must be carefully traced in blocks and mounted. The large number of Native block surveys received, as made by private authorised surveyors, which have all to be replotted on the block sheets, placed on Record and Index maps, together with the preparation of instruments of title under the Native Land Acts for the whole colony, occupies a large proportion of the time of the office staff; but the arrears of “memorials,” I am happy to say, are gradually being worked off, though we are still a good eighteen months behind the Court. The office at Gisborne is kept up almost entirely in the interests of the Native surveys; all those made in that district being checked and plotted on block sheets before transmission to this office. A proper safe to keep these valuable records in is a great want in the local office.

The new season commences with a considerable amount of work on hand, more especially in the matter of Land Purchase surveys which sum up a total area of nearly 600,000 acres. These surveys are undertaken at the request of the Commissioners. The official staff will not be able to accomplish them in any reasonable time. The settlement surveys are mostly in small detached lots, which have been applied for, and are scattered from end to end of this district. In addition, there are a large number of applications for “boundary surveys.” These surveys, which I have on several occasions drawn attention to, are the most troublesome and unprofitable the Department has to deal with. Their nature is accurately described in Major Palmer’s report, page 9, last paragraph—under the system of free grants to “forty acre immigrants.” They are becoming more difficult and expensive from day to day, as the chance of finding the old marks lessens, and their extent is exceedingly large. I am constantly in receipt of letters and visits from unfortunate settlers who are unable to find the whereabouts of their lands—and are thus prevented from occupying them. Most of the lands were surveyed, and granted twenty years ago. When I tell you that the surveys were magnetic compass surveys, the lines of road cut “by the mile,” saplings used as pegs, with no inspection, and that the country has been overrun by cattle and gum digger’s fires, you will have some idea of the difficulties the surveyor has before him when he attempts to find any of the old marks in what is little better now than an undefined wilderness. These surveys are scattered all over the North, and their extent is very great. They are a perpetual drag on the energies of the Department, and are the most expensive, and least satisfactory of any. The ultimate cost of them is a matter which I hesitate to inquire into. This much at least is known, that they will cost double any new surveys.

In addition, there are the road surveys, in exercise of the rights of the Crown through Native Lands, and lands sold by the Crown on conditions implying the survey by the applicants, with a five years reservation of the road rights. In the majority of cases this right must lapse for want of surveyors to lay out the roads, unless the Government should see fit to extend the time under which the right could be exercised.

The boundary line between this district and Hawke’s Bay will shortly require defining, unless it can be altered by Parliamentary enactment, and this would be the preferable course, if possible.

I am informed by the Land Purchase Commissioner that there is likely to be a considerable demand for surveys under the Native Land Acts in the Taupo district this next season, both for Land

* The instructions of the Registrar-General of Land on this subject, are to the following effect that if the Chief Surveyor, on ascertaining by re-survey or otherwise, the necessity for alteration of any sectional boundaries, cause such alteration to be made on the public maps, and certifies to the Registrar accordingly, there is no reason for insisting on the correction of the Crown Grant or other instrument of title. The things to be insisted on are the rectification of the description of such boundaries by the Survey Department, and the corresponding correction of the public map before issue of the certificate of title.
J. T. T.

Purchase and Court purposes. If, as it is to be hoped, that some further information will be obtained as to the country west of the Lake—which is at present a *terra incognita*. I hope to be able to extend the triangulation in this direction during the summer to control the other surveys.

S. PERCY SMITH,
Chief Surveyor.

No. 3.

CANTERBURY.

Survey Office, Christchurch, 17th July, 1879.

The progress made in the various surveys noted under separate headings will, I venture to hope, be considered satisfactory both with regard to the acreage returned as finally completed, and with respect to the closures shown by the connections made with the minor triangulation pushed on from various independent basis comparable with one another by sides common to both.

The year just ended shews a further advance in settlement surveys of over half a million of acres, the plans of which were completed as the work progressed, thus enabling the field checks to be applied, the work proved and sent into the office without delay, and the Crown Grants to issue as they were required.

MINOR TRIANGULATION.

I have not relaxed my efforts to push on the minor triangulation in every locality where sectional surveys are required, and, with the exception of the outlying districts that I hope to begin next summer I have now fairly succeeded in putting the minor triangulation on a satisfactory footing. During the year 385,020 acres, with topography, have been completed by Messrs. Connell and Maben, the work showing excellent closures. Mr. Welch has done 108,000 acres on the Peninsula, and Mr. Brodrick 41,700 on the north side of the Waimakariri, these surveys, owing to the nature of the country, involving much laborious bush or manuka scrub cutting.

The late Mr. J. Mitchell triangulated 176,960 acres, the calculations of which have been completed, and the necessary plans made from his field notes by an officer of this department. As, however, Mr. Mitchell's notes of the topography could not be plotted without his interpretation, his work has only been included as triangulation without topography. The untimely death, by drowning, of this most experienced and trustworthy trigonometrical Surveyor was a great loss to the Department and the profession. During the year Mr. Maitland of the staff has re-observed no less than 470,376 acres of the old Canterbury triangulation, this not requiring topography, as it had been obtained by traverse survey.

Of minor triangulation the result for the year will therefore be 534,720 across, with topography, and 647,336 without; together 1,182,056 acres. This, with the work reported as complete during the previous one and a-half years that I have had charge of this district, gives 1,435,544 acres with topography, and 1,148,042 acres without; a total of 2,583,586 acres completed in the field and mapped under my supervision.

The work has been carefully tested and checked in every way, the results of the Inspector's measurements of the bases of verification as compared with the Surveyor's declared distances, and the closures on sides of triangles, where different Surveyor's work adjoined, having been from time to time forwarded you. The average error disclosed only slightly exceeds half a link to the mile, which, taking into consideration the instruments used, the smallness of the triangles observed, and the rapidity with which the work has been done, can but be deemed by yourself most satisfactory and creditable to the Surveyors.

I have previously reported that the Timaru triangulation, done by the Messrs. Sealey, required revision in several places, and as the work proceeded, it was found that, without re-observing the whole, no satisfactory results would be obtained. This triangulation, though extending over country, a great proportion of which is sectionally surveyed, is much required, and used for lands transfer surveys which could never be thoroughly checked while any question remained as to the correctness of the triangulation on which such surveys were based. Mr. Maitland has more than half completed the work at a cost of under one halfpenny per acre.

SECTIONAL SURVEYS.

I am glad to report most satisfactory progress in this branch of my work. The contractors have finished in the field and forwarded maps of 394,054 acres, costing 7½d per acre. This is a very low rate, and I do not think the work will ever again be done at such a price, as the sections in future contracts will be made more scattered, and the natural features will prevent such speedy progress as on the level plains, where a great proportion of the year's work was situated.

The staff officers have surveyed and mapped 110,202 acres, costing 1s. 8½d. per acre. This average would have been much less, but for the expensiveness of the Peninsula work, where excepting Mr. Nutter's, not completed, the surveys done comprise 262 sections, containing 14,999 acres at a cost of 4s. 7d. per acre, the mean size of the sections being only 57 acres. The amount of road traverse entailed by these surveys is 8,511 chains, and the bush cutting required for the road and boundary lines is no less than 8148 chains; the number of pegs driven having been 6145, or an average of 23 pegs to each section. It will be patent, therefore, that the work of the sectional surveys on the Peninsula is exceptionally heavy, and the cost per acre proportionally great as compared with the rest of the work.

Under the revised regulations lately issued, I shall be able to reduce the work by pegging merely one side of unimportant roads, and I trust this will have an appreciable effect upon the cost per acre.

The total surveyed by the staff and contractors is 504,256 acres, divided into 4219 sections of an average size of 120 acres, costing 10½d per acre.

As I last year remarked, it would be very unfair to institute a comparison of the cost of the surveys done by the staff, with these done by the contractors, seeing that the latter work under the most favorable conditions, the surveys done by the staff are very much scattered, and entail considerable loss of time in moving camp to the various localities where the sections are situated, and a corresponding amount of work to tie them in with the minor triangulation. Much time is also lost in finding and verifying the old survey marks and pegs on which they have to base or connect their surveys. The price at which a contractor would tender for such work would, in most cases be prohibitive.

TOWN LAND.

2,716 quarter-acre allotments have been laid off at an average cost of 5s. 7¼d. per allotment.

INSPECTION.

In compliance with general instructions the Inspector, has during the year, visited and tested, by actual measurement in the field, the work of each staff and contract surveyor engaged under my supervision in this district. The results of the bases of verification measured to check the minor triangulation have been forwarded you, and prove that the work is exceptionally good. You have likewise received diagrams of 30 field checks on sectional surveys, which show that, with two or three exceptions, where I have had to return the work for revision the surveys done by the staff officers and contractors are well within the limit of error allowed under the regulations. The Inspector and myself having also visited some of the staff surveyors' camps, I have been able to form a good estimate of the general efficiency of the various officers and their capability for successfully prosecuting the work entrusted to them; and here I may express my opinion, gained from previous experience, and during the time I have conducted the Canterbury surveys, *that frequent and regular inspection of the work in the field is, without doubt, the best safeguard for insuring accuracy in the linear and angular measurements*, and further that it is an incentive to good work both to the honest and careful surveyor, who is glad to have the accuracy of his surveys proved, as well as to the careless and untrustworthy officer who knows that under actual field inspection any discrepancies will be eventually detected.

ARREARS OF SURVEY.

The land sales for the first half of the past financial year were very large, and greatly increased the arrears with which I began it. The actual arrears of unsurveyed sections on the 1st July, 1878, were 6874, equal to 765,934 acres, to which has to be added the 2203 sections containing 268,484 acres purchased during the year, giving a total of 9077 sections, 1,034,418 acres. The number of free selection sections surveyed in the past twelve months is 3653 equal to 471,300 acres, leaving a balance of 5424 sections and 563,118 acres. But from a return recently compiled from the new sectional books, I believe the actual arrears to be at the present time 5484 sections, containing 561,340 acres, to these, however, must be added 480 reserves of various kinds, containing 39,479, acres. They may be enumerated as educational, school, gravel, planting, ferry, recreation, cemetery, police, drainage, river protection, and other works. Owing, however, to the pressing demands of the settlers to be put in possession of their boundaries, I have not attempted to include these reserves in my work except surveying any that were immediately surrounded by purchased land. Indeed, until lately, I was not aware that the total amounted to such a considerable area. They should, nevertheless, be included in arrears of survey which will then amount to 600,819 acres, of which about 200,000 acres are under contract.

In my last report I called your attention to the fact that when I took charge of the district there were large arrears of surveys executed in the field, but unplotted. The completion of these plots is causing a great amount of work. During the year Mr. Wright, at the Timaru office, plotted and calculated the areas of 534 sections, containing 80,858 acres. Mr. Monro at this office completing in the early part of the year 82 sections, equal to 4,508 acres.

Mr. Wright estimates the arrears still to be done at the Timaru office, as 220 sections containing 28,865 acres; but I am afraid that when all the old maps are gone over to determine the actual number of sections, that may be deficient in area or measurement, his estimate will prove short.

The arrears of unplotted sections in this office, including Bain's contract, I take to be 1591, containing 113,802 acres, of which, probably, 50,000 acres will require revision in the field. Since I placed Mr. Monro in charge of the Land Transfer branch, I have not requested any officer to complete these arrears, as I find that they are being gradually surrounded by the new surveys by aid of which it will in a few months, be easier to determine whether the data given in the old field books are reliable enough to enable the plotting of these sections to be proceeded with, or whether re-survey will be necessary.

Of arrears of trigonometrical survey I estimate that Mr. Welch has to complete 124 square miles on the Peninsula, and Mr. Maitland 440 square miles of the Sealey triangulation in the Timaru district.

MAPPING.

During the year there have been received from the staff and contract surveyors 228 large and 183 small plans which have been or are being placed on the ordinary blocks sheets. I cannot state how many of the latter have been prepared in the same period, as they are being constantly added to, but up to the 30th June, 239 had been completed or were in progress. To the same date the total number of plans received from the surveyors was 776, in the Timaru office 43 block maps have been completed and 9 are in progress.

In the reduction branch of drafting office 21 compiled survey district maps are completed or in progress, mounted tracings of 15 have been prepared as selection maps for the Public Office, and the rest are in course of preparation.

Under minor triangulation 40 district maps are completed, 15 more are finished as far as the triangulation extends to them, and 12 are in progress, giving a total of 67 survey districts, in which

minor triangulation is completed or is proceeding, Plans of 13 of these districts have been lithographed, and tracings of 18 more are now ready for publication.

CROWN GRANTS.

Crown Grant Record maps on which the grants are recorded as they are completed have been prepared for 31 survey districts. During the past twelve months 1318 grants of 1911 rural sections, 65 town allotments, and 12 public reserves have been prepared.

LAND TRANSFER SURVEYS.

Under this head you will note that a large increase of work has had to be undertaken during the year. Mr. Davies, formerly the officer in charge, left the department on the 31st July, and was temporarily replaced by Mr. Allen, who remained until the 31st October, when Mr. Monro took the supervision. At this time, owing to the deposit of numbers of plans of sub-division of estates, great arrears of work had accumulated, and I had, therefore, perforce, to increase the number of draftsmen by whose aid I have succeeded in reducing the arrears. Since Mr. Monro took charge, the increase work has been steadily overcome, and the public demands for the passing of their plans fully met.

The following synopsis of work passed through this branch of the office, when compared with that of the previous year, will shew the necessity for the increased number of draftsmen.

	1877-8	1878-9
Plans deposited and checked	58	154
Allotments on same	1793	6068
Sub-divisional plans required to be made		63
Applications to bring land under the Act		433
Transfers lodged, 2895 Plans requiring check 1326		
Mortgage „ 2132; „ 72	} 1878-9.	
Leases „ 133; „ 28		
Plans on certificates prepared in duplicate	1734	2895

In addition to the above, the whole of the old plans have been cut down, properly numbered and indexed and placed in portfolio's of three different sizes in the safe, which has been properly fitted for their reception. Any plan required can now be produced by the clerk at a minutes notice.

LITHOGRAPHS.

Plans of the minor triangulation of 13 survey districts have been prepared for this Department at the Head office. Plans of 8 townships and of 8 of the sub-divisions of the railway reserves were done at the *Lyttelton Times* office here, 6150 copies having been struck off at a cost of £221 10s.

SUMMARY OF WORK DONE, 1878-9

	Acres
Meridional circuit survey	480,000
Minor triangulation with topography	534,720
„ without „	647,336
4219 sections, sectional survey	504,256
Old Canterbury surveys replotted	85366
2716 Town allotments	741
—	
Land applications received and recorded	2203
Crown grants prepared	1318
Plans received from Staff and Contract Surveyors	411
„ „ Land Transfer Surveyors	154 allotments 6068

PROPOSED OPERATIONS, 1879-80.

MINOR TRIANGULATION.

Of the staff surveyors, Mr. Welch will easily complete the remainder of the Peninsula, including Lyttelton Harbour and the Port Hills, as there will be no more bush clearing to do. Mr. Maitland will finish the re-observation of the Sealey triangulation, and some of the districts which are but half done. Mr. Brodrick will complete the work remaining to be done north of the Waimakariri, and commence the triangulation of the Ashley survey district.

During this year it will be advisable to put 400,000 acres of the M'Kenzie country under contract. This, with the work to be done by the staff, will embrace nearly 900,000 acres, which is all that I need undertake.

SECTIONAL SURVEYS.

The arrears of sectional work and reserves are, in round numbers, 600,000 acres of which 200,000 are now under contract. I estimate that during the year, additional contracts for from 150,000 to 175,000 acres will be let, which, with the work to be done by the staff, will reduce the arrears to reasonable limits. A great proportion will, however, be outlying surveys, and much more costly to complete than the existing contracts.

The work on the Peninsula is the hardest with which I have to contend, the intricacies of the old surveys, the rough and precipitous country, and the troublesome nature of the roads to be graded, all help to retard progress. The land is, however, highly valuable, and the Road Boards are anxious to make permanent roads. To lay these roads out without due care would very quickly bring discredit on the department. I hope to be able to give more attention to this work, and next year to report more satisfactory progress.

Any township or reserve that may require to be sub-divided can be done by the staff officers.

LAND TRANSFER SURVEYS.

Mr. C. W. Adams will continue at his work until his services are required elsewhere.

When Mr. Maitland has completed the surveys he is now doing, I think he would be able to continue the main standard road traverse for giving starting points to the Lands Transfer Surveyors in places where triangulation cannot be re-established.

In conclusion I am glad to report that I have been, during the past year, ably assisted by my Inspector in the field and by the various officers in charge of the different portions of the office work.

JOHN H. BAKER,
Chief Surveyor.

No 4.

OTAGO.

Survey Office, Dunedin, N.Z., July 23, 1879.

This return consists of tables of different kinds of surveys finished by the staff surveyors and contract surveyors, from July 1, 1878, to June 30, 1879.

From it the actual field work of the department in this district will be seen to be:—

			£	s.	d.
Minor triangulation	20,150 acres; cost per acre,	1.2d.	102	18	0
" " with topography,	93,450 " "	1.4d.	548	0	0
Rural section survey ...	204,238½ " "	8½d.	7293	3	10
Town allotments ...	392 lots, each 18/5		361	0	4
Gold mining surveys ...	526 acres; cost per acre, 12s. 2½d.		321	8	9
Water races, roads, &c. ...	57¼ miles; cost per mile, 89s. 7d.		256	6	8
Other work ...	...	...	1620	1	6
		Total ...	£10,502	0	1
Add cost of office work ...	...	...	4,505	8	10
		Making a total for both field and office of ...	£15,008	7	11

In reviewing the work done by the staff surveyors, during the past year, I find that nine parties have been at work; but, including three contract survey parties, there were in all twelve parties for a considerable part of the time actually engaged in the field. The triangulation finished and sent in includes the whole of Bannockburn District, with topographical map; also the unfinished parts of Leaning Rock District, Fraser, Fraserside, part of Benger, South Wakatipu, and revision of part of Coneburn. The surveyors engaged at these surveys were Messrs. Strauchon, Park, and Wilmot.

The rural section surveys completed embrace land in Kurow, Dunback, Waikouaiti, Silverpeak, Waipori, Table Hill, Tuapeka East, Maniototo, Blackstone, Leaning Rock, Tarras, Lower Hawea, Lower Wanaka, Cairnhill, Teviot, and Benger District, besides numerous other smaller and scattered surveys. The average cost per acre (8½d.) must not of course be understood as any indication of the actual cost of ordinary rural sections from 50 to 320 acres, for a very large proportion, viz.: about 100,000 acres, have been laid off into Pastoral Deferred Payment Sections of from 1000 to 4000 acres, which system naturally reduces the cost per acre. On the other hand, the country which has been surveyed in this way, the Waikouaiti, Silverpeak, Benger, and Leaning Rock districts, is nearly all so exceedingly broken and mountainous, as to cause greater expense by the extra time and labour necessary. In the whole provincial district I do not know a more difficult and troublesome country to submit to sectional survey than that included in Waikouaiti and Silverpeak districts. This country was finished by Mr. Edie, and by Mr. G. M. Barr, contract surveyor. The checks by triangulation on this work shew a minimum error of 1 link per mile, and maximum error of 8 links per mile, the average being considerably within the limit. Bearing in mind the unusually rough character of the ground, I think the results satisfactory. The country surveyed by Messrs. Strauchon, Allan, Murray, and Mackay, on Mount Benger, the Old Man Range, and Moutere, into pastoral deferred payment sections, is not quite so inaccessible and difficult as that just referred to; yet it attains a great altitude, and is so liable to be covered with snow at all times of the year, as to render work on it trying and hazardous. On two occasions Mr. Murray was driven off the Obelisk by snow storms in the summer; but, by perseverance and skill, he succeeded in the feat of scaling the Obelisk Rock, fixing an iron rod on the top, and running bearings in all directions from it. Although its ascent had been attempted, no one has ever been known to have previously reached the summit of this rock. I would add, that the approach of winter compelled Mr. Murray to use great exertions to get this work completed; and I am glad to say that he succeeded, though details as to cross roads could not be fully carried out. In this connection I may mention that it would be an encouragement to the staff surveyors, were the general annual reports, printed at Wellington, to have in, say the Appendix, a *line* devoted to the name of each, shewing the amount of work done for the year, and its cost. I would not venture to have drawn your attention to this were it not that I am aware the staff surveyors of Otago feel the omission.

The gold-field surveys, and other spotting surveys, continue, as you will see, to be expensive. This, as you are aware, is due chiefly to the smallness of the areas applied for, the scattered positions they occupy, and their distances from the surveyor's head quarters. Frequently, applicants for small areas, or for portions of original sections in out-of-the-way places, grumble, personally or through the Land Board, at not getting their land surveyed so soon as they desire. Wherever the efficiency of the general service will not suffer, I remit the matter to the local surveyor, to do at once; but, in all cases, I allow him to decide whether or not he can leave his more regular work. This is the best I can do; but the public do

not seem to understand why a surveyor should not be in readiness to lay off their land whenever it is applied for.

I have made sixteen inspections during the year, and sent in fourteen checks, not including the exceptional ones done by Mr. S. G. Thompson.

Several of the surveyors have improved greatly in their map drawing, as Messrs. Edie, Langmuir, and Wilmot, who produce very creditable work. Mr. G. Mackenzie's appointment being only temporary, I think the amount of work he has had to do, and has on hand, may warrant his being placed now on the staff permanently.

DUNEDIN OFFICE WORK.

This work continues to increase in variety and amount. Besides the usual routine work of examining and checking the working surveys as they come in, and recording them, I am endeavouring to complete the block plans in all cases where only previously done in part. I find a large amount of arrears of this kind on my hands; only in gold-fields, Mr. Brown has kept up the mining surveys well to date. Mr. Wilson is doing almost nothing else but this work of compiling isolated surveys of blocks, and although not very long in the service, he has attained great proficiency, and produces beautiful maps.

There are 503 Crown Grants, and over 100 deferred payment licenses, which have been prepared by this office during the year.

In the land transfer branch, 44 plans have been examined, passed, and deposited, with the District Land Registrar, and 1229 certificates of title (in duplicate) prepared and issued during the year. As regards the maps sent in by some of the surveyors licensed under the Land Transfer Act, I find the great object with these surveyors is to get *the plan passed by me*, not as it ought to be, to make their plans in the first instance thoroughly conform to the principles of the regulations. This is a loss, as I have always plenty of other duties to do, while I may be in the office. At the same time, I think the evil will eventually effect its own cure, as the public will cease to employ such men.

The lithographic branch of this office has produced 15,750 maps for the year, at a cost of about £535.

W. ARTHUR,
Chief Surveyor.

No. 5.

WELLINGTON.

District Survey Office, Wellington, June 9th, 1879.

In compliance with the instructions contained in Circular, No. 70, of May 12th, I return the forms furnished therewith, filled in as directed, showing in detail the extent and cost of surveys and office work executed in this branch of your department, during the year ending 30th June, 1879.

PRELIMINARY REMARKS.

As my appointment to the charge of this office is but of recent date, it may be desirable to confine my remarks to a general summary of the operations of the staff during the past twelve months, only commenting upon such points as absolutely require notice.

THE COST FOR THE YEAR.

The total cost for the year, so far as can be ascertained, amounts to £22,142 12s. 9d., of which amount the field work is chargeable with £17,103 12s. 9d., and the office with £4,449; the balance £590, is chargeable against other years also, and is consequently kept separate; it includes bonus to surveyors for five years' service, map cases, portfolios, instruments, &c.

The surveys will now be referred to in the order in which they occur in the attached return.

TRIANGULATION.

The only triangulations which have been carried out in a comprehensive manner are those of the following officers:—J. D. Climie, John Annabell, J. F. Sicely, and Mr. Contract Surveyor, H. S. Palmerson, comprising 224,846 acres, at a cost of 2·1d. Diagrams and topographical maps have been prepared of this area.

RURAL AND SUBURBAN.

In the class rural and suburban surveys, the following areas have been defined:—

By Staff	...	...	...	52,620 acres at a cost of 1s 8d. per acre.
By Contract	...	...	...	34,500 „ „ 1s 5·7d. „
Total	...	...	...	87,120 „ „ 1s 7·1d. „

Of this area about 40,000 acres represent arrears of survey completed during the year by the first ten surveyors named in the schedule, Mr. H. S. Palmerson, and to some extent by Mr. Gillett, contract surveyors. With few exceptions the surveyors worked under considerable disadvantage upon these sectional surveys, for the reason amongst others, that their work for the most part, comprised hilly forest country, contiguous to former surveys, which in many cases reports mention unfavourably.

TOWN SECTION SURVEY.

Only three officers, Messrs. Dundas, Sicely, and Briscoe, were employed in laying off town sections in Richardson, Hunterville, and on the Wellington Reclaimed Land. The totals being, 778 acres, in 569 sections, at £1 8s. 5d. per section. Mr. Dundas' survey might be classed with suburban survey at 14s. 6d. per acre.

LAND PURCHASE SURVEYS.

Messrs. Climie and Annabell are the only officers who completed any surveys for the Land Purchase

Department. Credit is claimed for 14,000 acres mapped from surveys by various officers in former years, bringing the total up to 47,389 acres at 6½d. per acre.

ROADS, ETC.

The staff, it will be observed, surveyed 111 miles of roads, &c., at a cost of £13 14s. per mile. These roads lie outside the areas sectionised, and represent useful and essential work at a moderate cost.

OTHER WORK, ETC.

There is nothing special to note regarding the other items, but the opportunity may be taken of stating that the numerous authorised surveyors, except Mr. E. N. Beere, have not sent in many plans; and as little or no information as to the progress made by them, had hitherto been received by this office, it would appear hopeless to attempt any report upon their operations. Mr. Beere's maps represent 47,322 acres.

OFFICE.

During the first nine months of the past financial year, the current work, preparation of county maps, and diagrams of triangulation on true meridian, occupied the office staff.

During the past three months attention has been chiefly given to introducing the general system of map record, and compiling Index plans. The triangulation had previously been mostly reduced to true meridian on the district sheets, but much work still remains to be done before the records of my predecessors (the Chief Surveyor and Deputy Inspector of Surveys) can be assimilated; and one map substituted in lieu of two of some districts, with dissimilar zeros. This remark applies also to all other maps formerly used in the separate offices in this Provincial District.

The arrears of Crown Grants (those for which special applications have been made) have been nearly worked off. Six draughtsmen were engaged upon this duty; the county maps are having all Native Land Court triangulation and boundary surveys added to them, and will shortly be completed. The lithograph of the East Coast, proofs of which were printed in 1872, is being corrected, and will soon be available for public use, and generally it may be said that the office staff has been employed systematically in endeavouring to make head against an accumulation of years of arrears in compilation, Crown Grant index and topographical maps, &c., &c.

GENERAL CONCLUSIONS AND SUGGESTIONS.

Considering the results of the year, the following points seem to be brought out:—

1st. Minor Triangulation, executed under Mr. G. W. Williams' able direction, has been carried over some of the roughest bush country in this colony, establishing permanent standard points of reference, at convenient distances, furnishing useful topographical maps for present use, and demonstrating the facility with which the New Zealand Government system of survey can be applied by energetic officers under exceptional circumstances.

2nd. That the cost and difficulties of the estate and sectional surveyors are greatly increased in those localities which have not been previously minor triangulated; with the additional disadvantages that the work, as mapped, representing long unchecked or hanging traverses, creates a feeling of doubt as to the reliability of the work.

Hence it follows that minor triangulation should be extended during the present financial year over all those parts of the Provincial district where it is most immediately required; with this object it is proposed to detach Messrs. Dundas, Northcroft, Llewellyn Smith, J. Annabell, and another officer to attend to this essential of the system; and Mr. J. D. Climie to remedy the present defective state of our maps in regard to topography.

J. W. A. MARCHANT,
Chief Surveyor.

No. 6.

SOUTHLAND.

Survey Office, Invercargill, 1st July, 1879.

It will be seen from the tabular statement attached, that there have been executed during the year 102,400 acres of triangulation (including topography) at a cost of 1.16d. Of rural and suburban surveys there have been executed 411 sections, embracing 54,822 acres, at a cost of 1s. 5½d. per acre. Of town section surveys, the size of which has averaged three-quarters of an acre, there have been executed 545 allotments, at a cost of 13s. 5d. per acre.

In reference to the rural and suburban surveys, I have to state that in viewing the acreage cost, allowance will require to be made for the fact that about a third of the total number of sections were in bush, the acreage thus embraced being some 7,000. Of the town sections also a small proportion was in bush, the sections, on an average, being unusually large. The exceptionally bad weather which prevailed for several months about the beginning of the financial year, retarded the work very seriously, and added largely to the cost of the Longwood Quartz Mining Lease Surveys; a work which, owing to the country being thickly timbered, would at all times be laborious and expensive. The Surveyor's report shows only nine working days in July, and four in August; a state of matters which I am glad to report as very exceptional. Of course, the isolated and dispersed nature of the bulk of the rural surveys, owing to the system of free selection before survey being in operation, will at all times cause the acreage cost of survey to be considerably in excess of what it would be were the land surveyed ere being sold. The work during the past year, owing to the presence of bush, &c., has necessarily been somewhat difficult and tedious, and the acreage overtaken has thus been much less than it would otherwise have been. So far as I can see from the action of the Waste Land Board, and the present necessities of settlement we will soon be able to get the surveyors into the open country, and thus be in a position to overtake the

selections that have been left outstanding consequent upon the pressure of more urgent work. Though the acreage thus outstanding is considerable, the department, even with its present staff, would soon be able to overtake it were we once clear of those bush surveys that have hitherto monopolized so much of the time of the department.

I may state that some 17,000 acres of the land surveyed during the past year, have either been already thrown open for application under the deferred payment system, or will shortly be so. A certain proportion of the land either has been or will shortly be parted with by public auction,—the greater bulk of the acreage surveyed, however, having being applied for and sold under the free selection system.

In regard to triangulation I have to state that the chief work in this direction has been to carefully measure a base line in the Waiau district, and to carry a network of triangles up the Waiau Valley, so as to join upon Mount York, where the triangulation brought from the Lake district down the Von Valley presently terminates. A verification base is presently being measured on the north bank of the Wharrie Creek, some five or six miles south of Mount York, and in a month or two I trust that the junction with the triangulation brought down from the Lakes district will be effected. When the triangulation has been completed, there are applications in the Waiau Valley, which the surveyor will survey as he returns.

LITHOGRAPHED MAPS.

There have been lithographed during the year nineteen different kinds of maps; some of the maps being designed to guide selectors and purchasers of deferred payment and town lands; the remainder being maps of districts showing all the surveyed and sold sections on the scale prescribed by you of one mile to inch. For Road Board, County Council, Land Tax, and General Government purposes, these district maps are invaluable, and at the cost of considerable time and trouble to the department we have already got six districts lithographed—the surveys for purposes of selection and general reference being thus put in a cheap and readily available form. The districts already published are Aparima, Oreti, Winton, New River, Campbelltown, and Jacobs River, and that of Hokonui, a large and important district, containing numerous surveys, is already well in hand. When all the districts are lithographed we will then be in a position, by joining them together, to prepare maps with little trouble, showing at a glance, on a scale of mile to inch, every surveyed section in Southland.

Of the nineteen lithographed maps above-mentioned, there have been published on an average 232 copies of each, or 4,400 points in all at a cost outside of draughtsmen's time of £55 18s. 6d. Were the prints all sold at the price published, a contingency which of course cannot arise, the sum realized would be some £370.

LAND TRANSFER WORK.

During the year the plans of 646 certificates of title have been prepared, each certificate being in duplicate, thus making 1,292 marginal plans in all. In addition to this, of course, the draughtsman's time has been largely taken up examining and correcting, where wrong, the diagrams and verbal descriptions sent in by the public on memorandum forms. The preparation of Land Transfer record plans is also a work of imperative necessity, and so much of the draughtsman's time as could be spared, after meeting the urgent wants of the public, has been devoted to this object. While one draughtsman is constantly at the work, assistance from the other office draughtsman has frequently become necessary.

CROWN GRANT WORK.

There have been prepared during the year the plans of 450 Crown Grants. These, of course, have been recorded on Crown Grant maps, many of which required to be constructed for the purpose.

There is a deal of work before the office, blocking out, and constructing working block plans of those districts which in the old days were left unblocked, the section numbers, as in the cases of Hokonui and others, being scattered over the district from one to six hundred. Till the various surveys, each of which, for the most part, appears on a separate plan, are combined in proper block sheets, the records of the working surveys will not be in a satisfactory state. Whenever time permits it is my endeavour to push this work forward as quickly as possible. Considerable inconvenience has resulted from the strong room containing the maps being some distance outside of the building, but I am glad to state that this matter will soon be remedied.

JOHN SPENCE,
Chief Surveyor.

No. 7.

NELSON.

DURING the year ending 30th June, 1879, the staff surveyors have been employed on minor triangulation, settlement, and mining surveys. Four officers have been engaged principally upon the first, and a fifth assisting with subsidiary work, which is largely used on the coast in connection with mining work.

The contract for triangulation of 250,000 acres in the Nelson district, covering old surveys, will be completed in a few days, and is the largest area required for present purposes.

I propose, if a young and active surveyor, trained to trig-work in a rough bush country can be found, to employ him solely on that work during the coming year.

Triangulation requires extension in many parts of the district, especially the West Coast, where it is difficult to obtain tenders for small areas by contract, and the district officers are taxed to the utmost in spotting settlement and mining surveys.

The arrears of mining surveys on the West Coast have been brought up during the year, but there are still some leases under the old surveys requiring connection, &c., to give the holders the same status

in a court of law as those made under the present system. These are being executed as the lessees hand in their leases for amendment of plans.

At the end of 1878 the various County Councils on the Nelson South-west Goldfields made complaints of delay in surveys of applications, and every effort was made by the staff to push forward the work.

The difficult nature of the district, being mountainous and heavily timbered ; the excessive liberality of the Land Regulations, giving privileges of *free selection as well as rejection afterwards in all parts however inaccessible*, renders survey operations slower and more expensive than in other parts.

The unfavourable nature of the climate on the West Coast also materially affects survey work, the rainfall of that district being the heaviest in New Zealand, reducing the number of fairly working days nearly 40 per cent.

In reviewing operations during the year, the arrears of acreage unsurveyed have been reduced as follows:—Arrears on 30th June, 1878, 171,832 acres ; arrears on 30th June, 1879, 130,454 acres ; less 41,378 acres.

The statement of acreage in arrear of survey is a very uncertain quantity, as *all* applications made to the Waste Lands Board are received and recorded for survey, unless any *prima facie* objection exists ; but, owing to the liberality before referred to, many of these applications are withdrawn, and some refused during the year ; thus, there was withdrawn during year ending 30th June, 1878, 56 applications, area 9,897 acres, and year ending 30th June, 1879, 87 applications, area 11,415 acres ; more 1,518 acres.

Since the alteration in the price of land in the district by "Waste Lands Act, 1877," by which it was increased in amount, the acreage applied for has considerably decreased, thus—

Year ending 30th June,	Applications.	Area.
1878	262	29,809
1879	116	8,505
Decrease	146	21,304

Under these various circumstances the arrears of acreage will be much sooner reduced, unless some sudden demand for land other than exists at present, takes place. The triangulation by district officers has much retarded surveys of applications hitherto, but as sufficient area has been covered to command most of the work, I look forward to a much larger amount being executed during next year.

In the older settled portions of the district round Nelson, applications for leasing land lay mostly in the broken and timbered localities, outside of the more easily accessible parts.

In a large number of the sections now held under lease, the lessees have never been put in possession by survey.

Areas have been ruled in on the office maps, and copied on the deeds, and rent paid for several years, the lessees not having improved their land, for which no provision existed in the Act under which they were held.

Applications are constantly coming in from these lessees to be put in possession, and as the Government have engaged to make these surveys (for which 6d. per acre was deposited), they must be dealt with and laid down as near in position as practicable.

The discrepancies in old surveys brought to light constantly are very great, and many of the field-books quite unintelligible, and of others no trace can be found.

In the above cases the system I have pursued is, by circuit traverse round irregular blocks of sections to localise the errors, leaving discrepancies to be worked out in detail within, as necessity requires.

Surveys have been executed in the Amuri district during the year, and minor triangulation has been extended to cover applications, but as these are all situated at high altitudes, but little can be done in the winter months, excepting necessary traverses of main roads, &c.

Field inspection has been principally directed to the West Coast, to which four visits have been paid, embracing a complete circuit each time,—also districts round Nelson and the Amuri. During the past two months I have found it necessary to remain at the head office for the purposes of supervision and arrangement.

TOWNS.

Owing to the pressure of other work but little has been done as to the establishment of permanent referring marks, excepting in the town of Nelson, which has now been supplied with stone stations carefully laid down by Mr. James T. Thompson.

A contract is let for the survey of a small township in the Buller circuit, in which referring marks are amply provided for.

DISTRICT OFFICE, NELSON.

The compilation of old surveys for application maps has been completed, and the several district offices have now been supplied with all the data available for public information respecting land. A uniform system has been adopted of keeping up these plans to date, and it is to be hoped that one great cause of complaint against the department which has existed for some years, has been removed.

It is to be regretted that so much delay has occurred in supplying county maps, but as there existed no good basis at the first, it was not possible to proceed without.

Before the compilation was finished, plans of county maps were required for the Deputy Land Tax Commissioner, and he was supplied with copies of district application maps on a scale of forty chains to an inch, showing all sections leased and sold. These, again, are being reduced by photo-lithography to eighty chains to an inch and printed. As furnished to this office they will be supplied to each county with an index plan of the districts, showing county boundaries.

Owing to pressure of work in office, copies of application maps were supplied to Deputy Land Tax Commissioner by contract.

Plans of eleven districts and eleven towns have been published, and forwarded to this office for sale out of the series proposed.

Mr. H. Trent, Chief Draftsman, is in charge of the district accounts and general supervision in the absence of the Chief Surveyor.

During the year 191 leases have been prepared, and 108 Crown grants.

Mr. Curtis, Land Transfer Draftsman, has prepared 126 certificates of title, and examined and checked 107 plans, in most instances, re-plotting old Government surveys.

I must again draw attention to the urgency of erecting a good fire-proof safe at the Nelson office for the preservation of the records.

A district survey office is required at Westport; temporary offices are being rented in the meanwhile.

JNO. S. BROWNING,
Chief Surveyor.

No 8.

TARANAKI.

Survey Office, New Plymouth, 1st July, 1879,

TRIANGULATION.

During the year 54,000 acres have been triangulated at a cost of a little over 2d. per acre. The rate is higher than usual, but is due to two causes. In the case of Mr. Anderson's work at Waitara, it was native obstruction in the shape of razing mounds and surreptitiously removing the pipes, whilst with Mr. Climie, at Waimate, it was caused by the necessity of building mounds seven and eight feet high at the majority of the stations and being of such height something substantial was required. I was all over the ground myself and saw that in no single instance where it had been done could it have been avoided. It was mainly due to the height of the fern, flax, and toi-toi on the plains. In Mr. Climie's work at Waimate, the verification base, fifteen miles distant from the original, gave good evidence of the reliableness of the work, there being a difference of only $\cdot 2$ of a link in a mile. His work at the Carlyle end closed on to Whenuakura triangulations executed in 1872; the values of the line by the two triangulations differing at the rate of 2.2 links per mile. The greatest accumulated rate of error per mile in the close of any polygon in this year's triangulation, is 1.5 links, the next two highest 1.3, and all the others under $\cdot 4$.

The triangulation now embraces all areas suitable for its prosecution, where sectional survey is likely to be needed, excepting from New Plymouth to Stoney River at Okato, which Mr. Skinner is now engaged upon; and its being thrown over the greater part of the old unreliable work affords great facility for the carrying out land transfer operations.

Correction has been made at the furthest extremity of the surveys, done under the system of circuit traverses a distance of eight miles to the westward of the meridian line. The meridian and perpendicular distance by triangulation differs only 7.2 links north, and 4.2 links east from the value assigned to it two years ago by the traverses, thus affording further evidence of the work being generally trustworthy.

SECTIONAL SURVEYS.

During the year the towns of Manaia and Stratford have been surveyed, and have cost at the rate of 12s. 2½d per section. Manaia on the plains is not, as many suppose, grass land, but covered with heavy fern through which all street and back section lines had to be cut; worse still was the case of Stratford; the forest having been felled, the lines had to be chopped through fallen timber, so that the work may be considered to have been done very economically.

The surveys of 33,185 acres of suburban and rural work have been completed; of these 17,490 were on the Waimate Plains, and in open country, the remainder in the bush. On taking into consideration the great difficulties that have been met with at Waimate through Native obstruction, the cost of 2s. 2½d. per acre, including the forest surveys, must be considered very favorable. I am pleased to be enabled to testify to the very excellent work executed by the staff, the closures in almost every instance being exceedingly good; and I have taken especial pains to see that they were genuine.

All the surveyors use the steel tape for measurements, the chain having long since been discarded here. In the forest over gullies from one to five chains wide, a thin steel wire has been used strained by spring balance, the amount for sag to be allowed for with a certain tension being previously determined; this gives results far more satisfactory than measuring up and down, and correcting it to horizontal measurement. In fact I may state in commendation of all the officers, that they spare no pains to make the work as accurate as possible, which in our forest country, where there is no triangulation, is indispensable. The only fault that I have had to find is, that closes which are in all reason excellent they have gone over again, seeking for some slight error that will make it closer still: and, as I tell them, unnecessarily increasing the expense by trying to make things perfect with imperfect material; there is no doubt, but that the good closes in the forest are due to the careful measurements made by the steel band, and the method used for maintaining the true bearing. In the traverses experience soon proves that the bearing in terms of the initial meridian cannot be continued long without some means of adjusting it, and as some of our sectional work has been from six to eight miles from the meridian line, the only way was to test it astronomically.

At three points on the Mountain Road, I have observed for true meridian, and I feel confident that no line on it from Inglewood to Mangawhero, a distance of twenty miles, is more than 1' out of the true

if that. In ordinary work the surveyor, when he needs it, clears a few trees south of his camp, and observes elongations with his 5in. instrument. The meridian of his traverses affords him the means of getting his latitude, the initial point being known; and the convergence to be applied is based upon his perpendicular distance; two nights' observations, if carefully taken, will enable him with confidence to correct his bearing if necessary. In no case where I have followed with the 7in. have they been out more than 1', and in one instance through some clearings being made where we were enabled to throw up a standard bearing, it gave the same result. Without this the forest surveys could not have been executed with their present degree of accuracy, so that after some years experience in this practice, I can with perfect confidence commend its uses to surveyors working in forest country.

One surveyor on the staff has a 5in. with perforated axis and lantern, and another is about sending to England for a similar one, evidencing their great interest in, and the necessity they feel there is for it. There are at the present time 6000 acres in Ngaere Survey district approaching completion, which would have been finished had it not been for the incessant rain from the 16th to the end of June.

In addition there are unfortunately 20,000 acres more at Waimate, and 7000 at Waitara, in both cases well advanced, but which have been stopped by the Natives interference; had it not been so I have every reason to believe that it would all have appeared in this year's return of work.

Under the head of Native detention and obstruction, only actual stoppage has been accounted for; the petty annoyances and hindrances in the prosecution of the Waimate work, caused by the adverse action of the Natives, although undoubtedly adding considerably to the expense, I have not noticed, but have included all expenses in the cost of the work up to the time the surveyors were removed, excepting the delay at the start.

The general work of the office has been checking of plans, traverse reductions &c., and entering them on the working plans and record maps, checking and passing deposited plans under Land Transfer Act, and drawing plans on certificates of title and preparation of Crown grants.

Besides the above, maps have been drawn for photolithographing of the provincial district, the Paritutu, Egmont, and Huiroa survey districts, and nine others for sale purposes. It is impossible to speak with confidence of operations for the ensuing year at the present juncture, the aspect of Native affairs being by no means encouraging; but immediately on the settlement of the present difficulties large tracts will no doubt have to be rapidly brought under survey, needing more strength than we have with the present staff.

THOMAS HUMPHRIES,
Chief Surveyor.

No. 9.

HAWKE'S BAY.

District Survey Office, Napier, July 14th, 1879.

The minor triangulation has now been extended over all the lands open for selection in this land district, and over those survey districts in which the arrear surveys are situated. The area minor triangulated is 12,480 acres, cost of the survey £56 6s. or 1d. per acre; the area minor triangulated and topographically surveyed is 383,400 acres, cost £1564 9s. 6d. per acre, .98 of a penny. The section surveys of lands for sale by auction, or on deferred payments, have from various causes been delayed; three contracts for 13,818 acres will be completed during the first month of the present year.

The area of the rural and suburban surveys completed is 48,061 acres, cost £1839 14s. 2d.,—per acre 9½d.

The surveys of all the sold lands which come under the heading of arrears surveys, with the exception of one application, have been placed in hand. The road surveys have taken up a part of the time of all the surveyors except two.

The necessity of our laying out the roads through lands already crown granted has retarded the work of the department. During the year 86 miles of road have been surveyed at a cost of £1089 14s. 3d., or £12 13s. per mile. For the Public Works Department I have supervised the works on roads to open out lands before sale, and have let 15 contracts for works, on 18 miles of road.

NATIVE LAND COURT SURVEYS.

The scale of charges for surveys under The Native Land Act 1873, as at present printed on the forms of agreement *re* cost of survey, having been prepared to meet the survey of the outside boundaries, the survey of Native lands cannot be made at the same rates, now that the additional regulations, Nos. 10 and 11, providing for the road surveys, have been issued.

PROPOSED OPERATIONS.

The proposed surveys for the year 1879-80 include 300,000 acres of minor triangulation, and topographical survey over that portion of the district which has not yet been major or minor triangulated; and 6000 acres of section surveys in the Seventy Mile Bush District. The above named surveys, if approved, will be let by contract.

This year I propose to fix a few bench marks for land transfer surveys, in the town of Napier.

HORACE BAKER,
Chief Surveyor.

No. 10
WESTLAND.
TRIANGULATION.

In my last report I stated that I hoped to be able to return as completed, by 30th June, 1879, at least 260 square miles (156,400 acres.) I am much pleased to be in a position to report, that considerably more than this has been accomplished; 202,560 acres of major, and 89,450 acres of minor triangulation have been completed.

The whole of the Hokitika circuit, excepting a strip of land of an average width of eight miles, and comprising the most broken portion of the western slopes of the dividing range (Southern Alps) has been triangulated; and besides this a number of stations have been erected within the Okarito circuit, and the observations at five of the main stations, and two of the reference stations have been taken.

The work has been proved by closing at Wataroha base-line, which I measured at end of May, and declared to be 27,396.12 links in length.

The calculations of triangles, ruled by Kokatohi base-line, were completed on the 9th instant, and by these the Wataroha base-line should be 27,398.15 links; equal to an error of 2.4 inches per mile.

This result considering the nature of the country, the triangulation passed over, is very satisfactory, and exceeds my expectations.

I should state that distance 27,398.15 links, is derived from the calculation of a single set of the observations at station south of Bold Head, and Mount Bonar; there being not sufficient time to work it out by taking the mean of all sets taken at each station; but having worked out three independent values for the side from which the Wataroha base-line must be determined, and finding said three values so very close, I am satisfied that the result derived from the mean of all sets will only affect the decimal of the inch the triangulation is declared in error—as above.

The cost of the work amounts to 1½d. per acre for major, and 2½d. per acre for minor triangulation.

The computations of the differences of latitude, and convergency of meridian between Koiterangi (the initial station of the Hokitika circuit) and Abut Head (the initial station of the Okarito circuit) are in hand, and will be reported upon shortly.

CIRCUIT TRAVERSE (TOPOGRAPHICAL AND TRIGONOMETRICAL SURVEYS).

Ninety-seven thousand eight hundred (97,800) acres were completed by three of the surveyors at costs varying from 1.7d. to 3½d. per acre as shown on schedule.

The "errors in closing" for the past year stands as follows:—

District Surveyor Murray's closures range from ½ link to 4¾ links per mile, giving an average error of 1.56 links per mile.

District Surveyor Lord's closures ranged from 2½ to 6¾ links per mile; giving an average error of 4.50 links per mile; and those of Assistant Surveyor Smyth ranged 4½ to 6 links, equal to an average error of 5 links per mile.

The mean error for all the circuit traverses for the year is 3.68 links per mile. In justice to Messrs Lord and Smyth, I desire to state that their traverses covered much rougher ground than those of Mr. Murray, and hence the great difference in closures.

RURAL AND SUBURBAN SECTIONS.

As per schedule cost varying from 2s. 1d. to 4s. 6d. per acre. The sections surveyed by District Surveyor Lord, considered mostly of small isolated lots, which had been left unsurveyed in former years, owing to difficulty of access and great cost. Generally, the rural and suburban section surveys were carried on contemporaneously with the circuit traverses, but in the Grey district I found it necessary, in several instances, to depart from this plan, owing to the clamour for survey of isolated sections sold years ago, and hence the higher price of cost of survey per acre in that district.

OTHER WORKS.

A very large proportion of the time of the surveyors was naturally taken up with fixing former section surveys wherever they came within easy distance of them. I have in this way succeeded in all but completing the maps of 23 blocks, which, for the greater part, contain rural and suburban sections surveyed before the present system was introduced, and I expect to be able thus to record on our block maps, during the current year, the remainder of the old surveys within the Hokitika and Grey districts.

One of the surveyors also assisted the officer employed at triangulation, (Mr. Roberts) with the erection of the stations which, in no small degree, contributed towards so great an area being completed during the past year.

PROPOSED OPERATIONS DURING THE YEAR ENDING 30TH JUNE, 1880.

TRIANGULATION.

The triangulation (major and minor) as far as completed, now has placed that part of Westland in such a condition that a surveyor, unless incompetent or absolutely careless, cannot possibly get into trouble with his surveys.

Trigonometrically fixed points are to be found in all the valleys; and checks and re-checks upon surveys may now be had at almost any point within the sea coast, and a line eight miles west of the top of the dividing range; and I trust that nothing will occur which will prevent this triangulation being carried down south, through Jackson's Bay circuit to Martin's Bay, where a connection with the Otago surveys could be established.

Already part of the Okarito circuit is well in hand south of Wanganui River, and I believe I can promise that at least 500 square miles, extending from Wanganui River to Karangarua River, a distance of about 50 miles, shall be completed within the year.

I have lately been exploring the country between Weheka and Waiho Rivers, about the suitability of which for triangulation, I had some doubt, and found that the difficulties are not so great as I anticipated, and that a network of very well conditioned triangles can be thrown over it. I at once fixed upon the position of 21 stations (9 main and 12 reference stations), which will command all the land between the main range spurs and the sea coast, a width from 10 to 14 miles, and made arrangements for Mr Roberts' party (under supervision of Assistant Surveyor Smyth, now camped on Wataroha Flat) to erect these stations during July, August, and perhaps September, during which time Mr. Roberts will be employed at mapping and calculations at Hokitika office.

TRAVERSE CIRCUIT AND SETTLEMENT SURVEYS.

To be carried on together as heretofore. Now that the worst of the work is over, fixed points to be had along many of our roads, within $1\frac{1}{2}$ to 2 miles distance from each other, and a great portion of the old Westland surveys, embodied with late work and recorded on the new maps, a reduction in the cost of settlement surveys may fairly be looked forward too, and I expect that it will not exceed 2s. per acre in the ensuing year.

SUNDRY SURVEYS.

The reconnaissance survey between Jackson's River and Dart Rivers, contemplated in 1877, was fortunately not taken in hand last year. The long continuance of rainy weather would no doubt have made it a very difficult and costly work, but perhaps this survey may be successfully carried out this year.

The connection between Westland and Canterbury triangulations also remains still to be established.

Mining surveys, water races, &c. to be attended to as heretofore.

OFFICE WORK.

I have been very much hampered for want of assistance at preparation of Crown grant, block, and selection maps. The chief draughtsman's time is fully occupied with routine work, attending to applicants &c., in Land Office, drafts of Crown grants, checking land transfer plans &c. Only the second draughtsman's time and a small portion of the time of the Land Transfer draughtsman can be devoted to the preparation of the above plans. I am gradually overtaking back work, but it is by a slow and tedious process, owing to the constant interruptions in the case of the former officer, by the spotting survey plots and circuit traverses coming in from surveyors which require recording on the block maps; and in the case of the latter by the Land Transfer work. It would be more satisfactory if the assistance of another draughtsman, if only for the time necessary to bring office arrears up to date, could be accorded me.

GERHARD MUELLER,
Chief Surveyor.

No. 11.

MARLBOROUGH.

I recommend, during the coming year, that Mr. Wilson continues the minor triangulation over the lower portion of the Wairau Plain to the sea, the Waitohi Valley, Port Underwood, and Queen Charlotte's Sound.

I further propose, with your approval, to employ a staff officer in the Pelorus Sound—a locality, from its rough and wooded nature, not suitable for minor triangulation; to establish stations on true bearing and distance in suitable positions on the headlands, and in the bays of that Sound, by means of short bases and micrometric readings, in lieu of minor triangulation for future starting and closing points, for the section surveys.

This work, together with the minor triangulation, proposed to be carried on by Mr. Wilson, before alluded to, will afford all the requisite data for determining the position of survey district and block lines over the northern portion of this meridional circuit (an area of about 900,000 acres) embracing not only the most important portion of the settled lands, but also that part of the district where settlement and land transfer surveys will chiefly be in demand.

SECTION SURVEY.

Hitherto for want of a Staff Surveyor, isolated and erratic surveys have been done by authorized surveyors paid by the applicants; but this practice works in an unsatisfactory and expensive manner. As a remedy I purpose in future, wherever practicable, to employ a staff surveyor, to carry out these surveys, charging for the same by a scale of survey fees to be adopted, applicants depositing estimated cost of survey, when applying for unsurveyed lands.

The major part of these surveys will probably be in the Kaituna and Pelorus Valleys, and Pelorus Sound, and the same officer engaged in establishing stations in that Sound before alluded to could, in conjunction with that work, carry on these surveys as well as fix in position and true bearing the numerous isolated surveys dotted about in the various bays, thus ensuring proper connections, closings, tabulations, office record, and more reliable and uniform work at no greater cost.

LAND TRANSFER BRANCH.

A marked improvement has taken place in the character of the work done by licensed surveyors for land transfer surveys, since under the control of the Survey Department.

In inspecting and passing plans in this department, I have had some difficulties to contend with, more particularly before the new survey instructions for the guidance of licensed surveyors were issued, my decisions in some cases being cavilled at, and in one instance (a block of sections in the town of Picton)

my decision was brought under the notice of the Minister of Lands by the applicant, and an attempt made to upset it.

The accompanying return will shew the statistics of this branch under my supervision during the year; and while on this subject, having regard to the proper keeping and preservation of the deposited and other plans, I would suggest that the attention of the Registrar-General be called to this matter; pointing out the advisability of his recommending a sum of say sixty (£60) pounds, being placed on the estimates, to be expended in fitting up the land transfer safe with proper shelves and tubes, as well as the requisite portfolios, in conformity with the survey regulations.

HENRY G. CLARK,
Chief Surveyor.

No. 12.

HEAD OFFICE.

SIR, Survey Department, N.Z., Head Office, Wellington, July 1st, 1879
I have the honor to report on the work done in the Head Office during the past year as follows:—

DRAWING OFFICE.

Maps of the North and Middle Islands, on a scale of 16 miles to an inch, illustrating the manner in which the lands of the Colony are held in possession, were completed from data supplied by the district offices. A meridional circuit map of the Colony was constructed, shewing the initial stations of each circuit placed in their true positions, from the best observations for latitude, and as nearly as could be ascertained in their proper longitude, on the projection designed by you as most applicable to New Zealand. Detailed maps of the following circuits recently completed have been drawn, viz., Collingwood, Amuri, Nelson, Grey, Buller, Karamea, and Marlborough; triangulation maps of eleven districts in Canterbury have been made for photo-lithographing. A map of Taranaki has been drawn on a scale of two miles to an inch for photo-lithographing on half that scale.

Since last year maps of the counties of Wairarapa East, Wairarapa West, [Hutt, Manawatu, Rangitikei, and Patea, have been received, and on these, and on those which were here before, have been compiled monthly, the transactions in land, so as to have at the seat of Government, maps on which can be seen—in considerable detail—the existing state of the colonial lands. There are, however, many counties, including the whole of Canterbury and Nelson and part of Hawkes Bay and Marlborough, of which the Chief Surveyors have been unable to compile maps yet.

A few of the 80 chains to inch district maps, have been put in hand for lithographing.

A new edition of the Survey Regulations, embracing the circular instructions of the department issued since the publication of the first edition, and including new illustrative maps, has been compiled and published.

During the months of December and January a considerable portion of the time of the draughtsmen was taken up with tracings and maps for the Land Tax department.

The maps constructed have been chiefly photo-lithographed; a few have been drawn on transfer paper, and since Mr. Spreat joined the Head Office he has drawn three on stone. Mr. Spreat's work is, as usual, first-class. The drawings for photo-lithographing by Messrs Flanagan and Kemp have been well executed; some of the lithographs rival in sharpness drawings on stone.

The miscellaneous work of the office, such as designing and constructing maps, calculations of differences of latitude and longitude, preparing and revising descriptions of parcels of land tracings, lithographs, &c., for various departments, cannot well be given in detail.

CLERICAL.

I have pleasure in stating that the clerical work of the head office has been efficiently conducted by Mr. Lakeman. His system of correspondence book-keeping, requiring as it does, care and skill, has the rare merit of being a ledger account of the transactions of the department. The number of letters and others papers recorded has been 6278.

LITHOGRAPHING AND PHILO-LITHOGRAPHING BRANCH.

The returns appended give the out-turn of the work done in this branch of the department.

Since the beginning of October, 1878, the photo-lithographic printing office, formerly under the department of Public Works, has been joined to that of this department, the whole being under the immediate supervision of Mr. McColl.

Although, as will be seen from the returns, the work thrown on this branch has been very considerable, it has been Mr. McColl's endeavour to meet the demands of the departments requiring work done in such a way as to give general satisfaction. The rule has been to print the plans or other lithographs sent, in the order in which they are received, unless they are stated to be urgently required, when they take precedence, and are put in hand at once.

It has been found necessary to employ an extra printer, and to erect the steam printing press which was purchased some time ago.

This machine, one of Furnivall's express patent, has now been in operation for about a month, and is doing very fair work. It is, however, only capable of printing paper 18 inches by 24 inches.

The small steam engine used as a motor having at the same time to drive paper-cutting machines is scarcely powerful enough, and the consequence is considerable irregularity in its speed and therefore in the quality of the maps printed.

When moving at its ordinary rate the machine prints at present 500 copies per hour. When the boys become more expert it will be possible to print 1,000 per hour.

It will be seen from the return, that although the photographing is a long way a-head of the printing, there is a considerable arrear of work in the gallery.

Mr. McColl's photographic assistant has been wholly engaged upon silver prints of views taken by the former photographer, Mr. Deverill. Of these, nine-and-a-half sets, each of one hundred and fourteen plates, have been printed, and there are three sets still to print, and it must be borne in mind that sun printing is a very slow process compared with press printing. When these three sets are disposed of the assistant will be available to be taught the art of photo-lithography.

The maps photographed for the Survey department are invariably printed to a definite scale or even number of miles, chains, feet or links, on the ground to an inch of paper. Other departments for which work is done, will, no doubt, gradually realise the advantage of the exactness of the process adopted by Mr. McColl, and instead of having plans printed on such scales as say 3 feet 10 inches to an inch, 3 feet 3 inches to an inch, &c., will have them on the practically much more convenient scale of say 3 feet, 4 feet, &c., to an inch.

A. BARRON,
Office Surveyor.

No. 13.

RETURN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE COLONY OF NEW ZEALAND, FROM 1ST JULY, 1878, TO 30TH JUNE, 1879.

Provincial District.	Chief Surveyor.	Meridional Circuit or Major Triangulation.		Minor Triangulation without Topography.		Trigonometrical Surveys with Topography.		Rural and Suburban Section Survey.			Town Section Survey.			Native Land Court Surveys.			Native Land Purchase Surveys.			Gold Mining Surveys.		Road, Railway, and Water-race Surveys.		Detention by Native opposition or other cause.		Miscellaneous Work.		Total Charge against the Appropriation for 1878-9.				Remarks.		
		Acres.	Cost per Acre.	Acres.	Cost per Acre.	Acres.	Cost per Acre.	Acres.	Average Size.	Cost per Acre.	Acres.	No. of Allotments.	Cost per Allotment.	Acres.	Average size Blocks.	Cost per Acre.	Acres.	Average size Blocks.	Cost per Acre.	Acres.	Cost per Acre.	Miles.	Cost per Mile.	Cost.	Cost.	Field Work.	Supervision, Inspection, and Office Work.							
		d.	d.	d.	d.	Acres.	s.	d.	Acres.	s.	d.	d.	d.	d.	d.	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.		
General Office																																	Includes £2,702 9s. 0d. the cost of the photographic and photo-lithographic printing office, instruments, &c.	
Auckland	S. P. Smith ..	140,202	1/4	540,202	'80	259,413	1'16		115,618	244	1/0	214 1/2	275	21/	59,410	2300	3'12	130,879	2,470	'63	142	7/	263	12 2 0	324	9 5	1342	17 7	16,275	11 7	5,206	2 5	£3,836 15s. is for work done for other Departments, and for which transfers will be obtained.	
Taranaki	T. Humphries ..	136,000	1 1/2	54,300	2 1/2				33,185	75	2/2 1/2	428	1127	9/11 1/2								1 1/2	25 0 0	381	3 2	1538	6 3	7,163	0 6	1,758	10 2			
Hawke's Bay	H. Baker			12,480	1	383,400	'08		48,061	534	'0 1/2											86	12 13 0	30	0 0	741	18 6	5,509	19 6	1,531	13 8	£3,037 18s. of this expenditure was on surveys in arrear when Abolition Act came into force, 1st Jan., 1878.		
Wellington	J. W. A. Marchant ..					224,846	2 1/10		87,120	178	1/7 1/10	778	569	28/5			47,389	9478	'6 1/2				111 1/2	13 14 0	21	15 0	355	6 0	16,891	8 7	4,802	4 4		
Nelson	J. S. Browning ..			152,748	1 1/2	46,043	3 1/2		37,823	123	1/10 1/2	8 1/2	53	15/1 1/2													1766	7 9	9,309	19 5	2,540	17 10	£1,406 1s. 9d. of this expenditure has been refunded in the way of fees.	
Marlborough	H. Clarke								1,027	36	2/1 1/2																							
Westland	G. Mueller	202,560	1 1/2	89,450	2 1/2	97,800	2 3/5		4,249	39	2/7 4/5																							
Canterbury	J. H. Baker	480,000	2/10	647,336	'68	534,720	1'61		504,256	120	'10 1/2	741	2716	5/7 1/2																				£1,164 0s. 6d. is for offices for receiving land applications. £19,848 1s. 1d. was expended on surveys in arrear on 1st Jan., 1878.
Otago	W. Arthur			20,150	1 1/2	93,450	1 2/5		204,288	331	'8 1/2	497	392	18/5																				
Southland	John Spence					102,400	1 3/17		54,822	133	1/5 1/2	376	545	13/5																				Mining surveys exceptionally costly.
TOTALS AND AVERAGES		958,852	'61	1,516,756	1	1,742,072	1'6	1,000,399	152	12/1 1/2	3,043	5,677	11/3	59,410	2,300	3'12	178,268	3,241	'6 1/2	2,385	24'5	618				757	7 7	7,894	0 7	102,429	8 3	46,554	11 10	

STATEMENT OF DISTRICT OFFICE WORK EXECUTED IN ADDITION TO COMPLETION OF SURVEYS AND MAPS—FOR YEAR 1878-9.

CROWN GRANTS, PREPARED.

District.	No. of Grants.	Area—Acres.
AUCKLAND	407	116,554
TARANAKI	156	7,821
HAWKES BAY	56	8,673
WELLINGTON	231	79,267
NELSON	108	1,846
MARLBOROUGH	19	631
WESTLAND	314	10,055
CANTERBURY	1318	267,381
OTAGO	603	53,756
SOUTHLAND	450	80,200
Totals	3662	626,184

NATIVE TITLES, PREPARED.

District.	Memorials.	Area.	Certificates of Title.	Area.	Government Land Purchase Conveyances.	Acres.
AUCKLAND	267	ACRES. 729,261	17	ACRES. 27,615	9	14,342

LAND TRANSFER WORK.

District.	No. of Plans Passed.	No. of Plans Placed on Certificates of Title.
AUCKLAND	25	354
TARANAKI	40	1,502
HAWKES BAY	30	
WELLINGTON	65	1,105
NELSON	107	126
MARLBOROUGH	8	128
WESTLAND	56	184
CANTERBURY	154	2,895
OTAGO	44	2,458
SOUTHLAND	27	1,292
Totals	556	10,014

No. 14.

STATEMENT OF THE EXTENT AND COST OF TRIANGULATION EXECUTED IN NEW ZEALAND UP TO 30TH JUNE, 1879.

District.	STANDARD SURVEY.				Minor Triangulation without Topography.	Cost per Acre.	Minor Triangulation with Topography.	Cost per Acre.
	Meridional Circuit.	Cost per acre.	Major Triangulation.	Cost per Acre.				
Auckland—prior to 1877 " since 1876	...	d.	8,060,287 1,376,696	d. .32 .28	125,000 940,496	d. .25 1.09	134,400 1,779,167	d. 1.4 .98
Taranaki—prior to 1877 " since 1876	590,000	1.1		.4	20,000 122,500	.5 1.8		
Hawkes Bay—prior to 1877 " since 1876			1,971,120	.4	37,000 93,737	1 2.45	479,800	.98
Wellington—prior to 1877 " since 1876	211,000	.19	3,958,000	.75	1,970,000	1.5	611,000	1.5
Nelson—prior to 1877 " since 1876	4,997,120	.125			80,020	1.2	288,521	3.5
Marlborough—prior to 1877 " since 1876	3,000,000	.083						
Westland—prior to 1877 " since 1876			554,160 632,000	.8 1.43			100,880 346,758	1.8 2.5
Canterbury—prior to 1877 " since 1876	6,143,000	.173			*2,318,800 1,148,042	Not known. .75	1,435,544	1.85
Otago—prior to 1877 " since 1876	10,300,000	.066	358,400	.5	20,150	1.9	6,581,407 596,637	1.5 1.25
Southland—prior to 1877 " since 1876	2,940,000	.066					1,520,000 209,500	1.5 1.4
	28,181,120		16,910,663		7,375,745		14,083,624	

* 1,843,700 acres of this either not reliable, or stations lost.

NO. 15.

ABSTRACT OF THE COST OF THE VARIOUS CLASSES OF WORK EXECUTED DURING 1878-9.

District.	Settlement Survey		Road Surveys and Surveys for Public Works Department.		Gold Mining Surveys.		Crown Grants, Memorials of Ownership, Leases, &c.		Land Transfer Plans.		Native Land Purchase Surveys.		Miscellaneous,—including Surveys of Education Reserves, County Maps, &c.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
AUCKLAND	17,558	0 0	1,668	3 9	300	0 0	938	0 0	435	3 6	2,736	16 9	1,040	2 9
HAWKES BAY	5,023	4 5	1,772	5 3			200	0 0	200	0 0	50	0 0	360	1 0
TARANAKI	8,593	17 10	40	5 0			233	0 0	210	0 0	10	8 3	25	0 0
WELLINGTON	14,779	9 0	1,769	12 0			743	0 0	500	0 0	2,716	11 9	1,053	0 0
NELSON	8,479	11 2	797	9 8	1,162	9 9	145	15 0	144	0 0			1,766	7 9
MARLBOROUGH	179	19 0			4	0 0	10	0 0	40	0 0			60	0 0
WESTLAND	5,050	3 11	497	4 4	174	1 0	328	2 8	123	19 8			324	18 4
CANTERBURY	29,680	17 6					1,026	11 2	2,046	6 4			195	17 8
OTAGO	12,069	19 1	100	0 0	1,100	0 0	420	0 0	500	0 0			100	0 0
SOUTHLAND	5,898	0 0	50	0 0	600	0 0	450	0 0	400	0 0			475	0 0
	107,303	1 11	6,695	0 0	3,340	10 9	4,494	8 10	4,599	9 6	5,513	16 9	5,400	7 6

No. 16.

HEAD OFFICE.—WORK EXECUTED IN THE LITHOGRAPHIC BRANCH OF THE SURVEY DEPARTMENT, FROM 1ST JULY, 1878, TO 30TH JUNE, 1879.

Size.	No. of Maps or other Papers.	Photo-lithographs.			Lithographs Drawn on Transfer Paper.		Lithographs Drawn on Stone.		
		No. of Plates.	No. of Maps, &c.	No. of Copies.	No. of Maps, &c.	No. of Copies.	No. of Maps, &c.	No. of Copies.	
Double Elephant	5	4	1	300	4	120			
Double Demy	25	42	19	1974	6	2820			
Imperial	186	198	93	24117	82	8070	11	907	
Double Foolscap	4	8	4	5400					
Demy	57	50	48	12602	5	2686	4	1070	
Half Royal	3	6	3	1650					
Foolscap	127	54	54	31777	71	63132	2	550	
Foolscap Circulars and Forms ...	361				361	35209			
Quarto Imperial	30				9	2246	21	2800	
Quarto Royal	8	8	4	6750			4	3650	
Octavo Royal	52	47	47	67800	4	6000	1	550	
Double Royal	36	24	5	1858	31	2301			
16mo Royal... ..	2	2	2	2000					
	896	443	280	156228	573	122584	43	9527	
Total number of impressions printed					288,339.				
Photographs of scenery, silver prints, 12in. by 15in.					1,033.				
Maps mounted					2,730				

No. 17.

ABSTRACT OF LITHOGRAPHS PRINTED.

District.	No.	Average Number of Copies of each Lithograph.	Impressions.
HEAD OFFICE	896	322	288,339
AUCKLAND	34	103	3,500
WESTLAND	1	100	100
CANTERBURY	16	384	6,150
OTAGO... ..	48	328	15,750
SOUTHLAND	19	231	4,400
Totals	1014		318,239

No. 18.

STATEMENT OF WORK ON HAND IN THE PHOTO-LITHOGRAPHIC PRINTING BRANCH OF THE SURVEY DEPARTMENT AT 30TH JUNE, 1879.

TO BE PHOTOGRAPHED.

74 Plans	1 Plate each, 16 × 16 in.
5 "	2 Plates " "
1 "	4 " " "

TO BE PRINTED IN SILVER.

2 Sets	228 Prints, 15 × 12 in.
---------------	-------------------------

TO BE PRINTED FROM STONE.

	Copies.
Double Demy	2,821
Imperial	204
Double Foolscap	1,500
Demy	1,500
Half Royal	2,200
Foolscap	250
Quarto Imperial	14,400
Half Foolscap	60,250
Octo. Royal	19,000
Total number of Plans to print	104
" " impressions	121,925

No. 20.

RETURN OF FIELD WORK EXECUTED BY STAFF, CONTRACT, AND AUTHORISED SURVEYORS IN THE PROVINCIAL DISTRICT OF AUCKLAND, UNDER THE SUPERVISION OF S. PERCY SMITH, FROM 1st JULY, 1878, TO 30th JUNE, 1879.

Surveyor.	District.	Major Triangulation.			Minor Triangulation.			Topographical and Trigonometrical Surveys.			Rural and Suburban.				Town Section Survey.				Native Land Court Surveys.				Native Land Purchase Surveys.				Gold Mining Surveys.				Roads, Railways, and Water-races.			Detention by Native Opposition, or other cause.	Other Work.	Total Cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	Remarks.	
		Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Acres.	No. of Allotm.	Cost per Acre.	Total Cost.	Acres.	No. of Sections or Divisions.	Cost per Acre.	Total Cost.	Acres.	No. of Allotm.	Cost per Acre.	Total Cost.	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Miles.	Cost per mile.	Total Cost.					Cost.	Cost.
S. Weetman ..	Takahue ..		d.	£ s. d.		d.	£ s. d.	7680	0.9	34 15 0	5102	51	1.2	359 6 0			s.	£ s. d.			s.	£ s. d.	786	2	1.0	42 3 6			s.	£ s. d.	15.5	16.2	214 2 2	£ s. d.	£ s. d.	£ s. d.		
E. Fairburn ..	Mahurangi ..				50000	1.25	257 0 0				24	2	10.0	12 0 0					3637	1	0.44	81 3 4															864 1 4	Charged to P. W.
T. W. Hickson ..	Pukekohe ..				98560	0.46	198 8 0				1567	24	3.3	160 0 0																							763 9 11	Field Inspector.
L. Cussen ..	Te Aroha ..	22000	0.21	20 0 0				180000	0.89	695 13 6	12272	38	1.3	839 17 6																							1656 19 4	One Cadet and two assistant part of time.
E. C. Goldsmith ..	Tauranga ..				19840	0.68	55 16 2	7680	0.7	22 8 2	1715	10	3.9	836 1 0	3.25	14	4.2	3 0 0																			702 11 7	One Cadet, five months.
C. Clayton ..	Waitemata ..				71040	0.8	257 8 0				376	8	4	92 18 6																						658 16 4		
G. A. Martin ..	Maramarua ..										553	6	6.2	172 14 1																						324 15 1	Six months in field.	
J. M. McLaren ..	Thames ..																																			309 9 0	Also Mining Inspector.	
J. O. Barnard ..	Arohana ..	118292	0.26	130 3 10																																734 18 5	Field Inspector.	
F. Simpson ..	Waikohu ..																																			856 12 5		
J. H. Balneavis ..	Mangatu ..				29600	1.25	154 3 4				105	2	0.55	2 18 0																						610 18 8		
C. Turner ..	Tauranga ..				45440	0.57	107 18 4				171	4	4.5	38 9 2																						298 0 8	Left 30th October, 1878.	
R. C. L. Reay ..	Maketu ..				7640	0.6	17 11 0				273	18	7.5	102 12 9	11	84	36.0	61 8 0	177	14	15.2	135 1 1														375 0 0	Retiring allowance.	
W. J. Palmer ..	Awaroa ..										5	1	32.0	8 0 0																						17 6 8		
W. S. H. Haig ..	Tutamoe ..																																			92 13 4	Left in September.	
		140,292	0.25	150 8 10	322,120	0.78	1,048 4 10	201,360	0.84	752 16 8	22,163	164	1.96	2,124 17 0	1,425	48	26.8	64 8 0	31,539	17	25	399 10 5	18,439	7	.6	613 4 2	142	48	7	50 0 0	157.35	11.04	1,833 7 7	152 11 0	1,050 13 1	9,239 3 7		

TEMPORARY STAFF SURVEYORS.

A. M. Ross ..	Opotiki ..										1760	8	2.7	237 3 4																						447 3 8		
L. Simpson ..	Rotorua ..																																				335 14 5	
H. A. Martin ..	Rangitiki ..																																			226 9 3		
											1760	8	2.7	237 3 4																						1,009 7 4		

CONTRACT SURVEYORS.

G. F. Hoeking ..	Awaroa ..										5944	36	0.9	266 14 0																						106 5 0		
A. Teeddale ..	Waiau ..										55,708	21	0.3	808 7 6																							850 0 0	
											61,652	57	0.34	1,070 1 6																							956 5 0	

AUTHORISED SURVEYORS.

					221,817	1.02	923 1 1	58,053	2.03	491 12 0	30,643	244	1.5	2,373 8 0	200.3	227	20.2	229 8 2	27,871	9	0.26	360 0 2	112,440	46	0.5	3,015 0 8										79.5	13.4	1,072 1 1	114 12 0	292 4 6	7,863 1 0	
GRAND TOTALS ..					140,292	0.25	150 8 10	540,292	0.89	1,971 5 11	259,413	1.16	1,244 8 8	116,618	473	1.00	5,805 9 10	214.5	275	21.0	293 16 2	59,410	28	0.26	759 10 7	130,879	58	0.55	3,628 4 10	142	48	7	50 0 0	263	12.1	3,183 16 8	324 9 5 Less	1,342 17 7 recoveries	190,67 16 11 3,836 15 0		15,231 1 11	

RETURN OF FIELD WORK EXECUTED BY STAFF SURVEYORS IN THE PROVINCIAL DISTRICT OF CANTERBURY UNDER THE SUPERVISION OF JOHN H. BAKER, CHIEF SURVEYOR, FROM 1ST JULY, 1878, TO 30th JUNE, 1879.

Surveyor.	District.	Meridional Circuit.			Minor Triangulation.			Topographical and Trigonometrical Surveys.			Rural and Suburban.			Town Section Survey.			Total Cost of Survey and Party from 1st July 1878, to 30th June 1879.	Remarks.		
		Acres.	Cost $\frac{\$}{\text{Acres}}$	Total Cost.	Acres.	Cost $\frac{\$}{\text{Acres}}$	Total Cost.	Acres.	Cost $\frac{\$}{\text{Acres}}$	Total Cost.	Acres.	No. of Sections	Cost $\frac{\$}{\text{Acres}}$	Total Cost.	Miles.	No. of Allotm.			Cost $\frac{\$}{\text{Allot.}}$	Total Cost.	$\$$ s. d.
Adams, C. W.	Christchurch	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	927 16 0	Standard traverse Survey of Christchurch and surrounding districts, for giving starting and closing points for Land Transfer Surveys.
Marchant, J. W. A.	Timaru	..	2	377 3 11	..	..	..	..	..	..	..	..	..	..	..	..	..	377 3 11		
Welch, J. S.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	844 13 4	Triangulation has required much bush cutting and entailed the cutting of many miles of manuka scrub.
Brodie, T. N.	Selwyn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	767 2 2	Re-observation of old Canterbury triangulation.
Brodie, T. N.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	838 7 8	Of this 1597 acres is bush work in the Oxford Forest.
Maitland, H.	Ashburton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	197 18 8	Isolated surveys entailing much traverse. Progress partly retarded by a low fever during which engaged in his duties.
Maitland, H.	Waimate	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	891 2 2	
Watt, D.	Ashley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	638 18 8	
Nalder, W. A.	Ashley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nalder, W. A.	Ashley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nalder, W. A.	Selwyn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hayward, W. G.	Selwyn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pickett, J. B.	Selwyn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	638 6 4	Very troublesome and intricate old survey revisions to Little River. He has also done 632 acres, the plans of which could not be completed in time for this year's report.
O'Brien, J. W.	Selwyn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	398 5 1	
Hay, Jas.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	401 17 3	
Donald, E. S.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	780 7 4	Bush Surveys on Bank's Peninsula entailing heavy bush cutting and road traverses, averaging not less than 23 pegs per section.
McNicol, M.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	737 7 2	818 acres more are reported as completed, but not mapped.
Seaton, A.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	632 10 7	Principally railway reserves.
Grano, W. H.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53 0 1	
Nutter, F. A.	Akaroa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	732 3 8	
O'Donogh, A.	Ashburton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	402 10 2	Principally railway reserves.
Lewis, H. J.	Geraldine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	168 6 4	
King, J. H. L.	Geraldine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	428 11 7	
White, H. C.	Geraldine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	374 13 1	Partly railway reserves, and partly sections of small size, averaging 27 acres each.
Anderson, G. S.	Geraldine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	444 14 8	
Smith, C. E. O.	Geraldine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	719 16 9	
Whitcombe, Geo.	Geraldine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	128 12 11	
Totals	Staff	..	2	377 3 11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12839 4 8	
Totals	Contracts	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13454 10 2	
Totals	Totals	..	2	377 3 11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26293 14 10	

RETURN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF OTAGO, UNDER THE SUPERVISION OF WILLIAM ARTHUR, CHIEF SURVEYOR, FROM 1ST JULY, 1878, TO 30TH JUNE, 1879.

Surveyor.	District.	Minor Triangulation.		Topographical and Trigonometrical Surveys.		Rural and Suburban.			Town Section Survey.			Gold mining Surveys.			Roads, Railways, and Water-races.		Other Work.		Total Cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	Remarks.		
		Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	No. of Allotm.	Cost per Allotm.	Total Cost.	Acres.	No. of Sections.	Cost per Section.	Total Cost.	Miles.	Cost per Mile.	Total Cost.			Cost.	
Couchman ..	Wyndham	12000	0 3/4	40 0 0		s. d.	34 1/2	1	3 0	5 3 6				s. d.	2 1/2	6 0	12 0 0	395 11 11	£ s. d.		Also 5450 in bush nearly completed. On sick leave six months, during which Mr. Jos. Allan had charge of party.	
	Benger					s. d.		17	2 6 3/4	52 13 11		63	6	13 4	42 0 0				1144 10 5			Goldfield. District large and surveys dispersed. Time considerably occupied in goldfield work, reports on Land, and Mines, &c.
	Teviot					s. d.		34	1 3	588 16 1		45	5	7 5	16 13 9				1104 17 0				Goldfield. Surveys scattered. Has visited and reported on land for settlement, &c. District difficult to work.
Mackay ..	Cairnhill					s. d.	1894	5	5 0	48 10 0											Also 17,000 acres section survey of which the field work is completed.	
	Waikaka					s. d.	13385	31	6	394 12 1												* £126 19/1 of this was included in last year, as work was done then.
Mackenzie ..	Blackstone					s. d.	242	18	5 0	85 15 0											District rough. Surveys scattered. Goldfield.	
	Idelburn					s. d.	7901	47	1 2	460 18 0												{ Tharr's map not yet received. Eight months.
D. B. Murray	Maniototo					s. d.	2712	11	2 3/4	167 0 4											* £422 18/4 paid last year, but maps received this year. £46 8/ paid by applicants.	
	Naseby ..					s. d.	31980	24	4 3/4	634 10 11												+ £122 10/5 also paid by applicants £21 still to pay on this contract. £26 13/4 still to pay on the contract.
W. Wilmot ..	Leaning Rock					s. d.	4	1	6 0	1 4 0											District rough. Surveys scattered. Goldfield.	
	Crownwell					s. d.	29723	39	6 1/2	615 8 0*												Tharr's map not yet received. Eight months.
Campbell ..	Bannockburn					s. d.	20048	123	8	682 12 0											* £422 18/4 paid last year, but maps received this year. £46 8/ paid by applicants.	
	Tarras					s. d.	20150	1 1/2	62 18 0													+ £122 10/5 also paid by applicants £21 still to pay on this contract. £26 13/4 still to pay on the contract.
W. Park ..	Leaning Rock					s. d.	8150	1 3	62 18 0												District rough. Surveys scattered. Goldfield.	
	Lower Wamaka					s. d.	82000	82000	1 1/2	462 0 0*												Tharr's map not yet received. Eight months.
M. Barr ..	Macetown					s. d.	20428 1/2	616	8 1/2	7293 3 10											* £422 18/4 paid last year, but maps received this year. £46 8/ paid by applicants.	
	Shotover					s. d.	20150	1 1/2	102 18 0													+ £122 10/5 also paid by applicants £21 still to pay on this contract. £26 13/4 still to pay on the contract.
W. Wilmot ..	Poolburn					s. d.	20150	1 1/2	102 18 0												District rough. Surveys scattered. Goldfield.	
	Tarras					s. d.	20150	1 1/2	102 18 0													Tharr's map not yet received. Eight months.
W. Park ..	Leaning Rock					s. d.	8150	1 3	62 18 0												* £422 18/4 paid last year, but maps received this year. £46 8/ paid by applicants.	
	Lower Wamaka					s. d.	82000	82000	1 1/2	462 0 0*												+ £122 10/5 also paid by applicants £21 still to pay on this contract. £26 13/4 still to pay on the contract.
M. Barr ..	Macetown					s. d.	20428 1/2	616	8 1/2	7293 3 10											District rough. Surveys scattered. Goldfield.	
	Shotover					s. d.	20150	1 1/2	102 18 0													Tharr's map not yet received. Eight months.
W. Wilmot ..	Poolburn					s. d.	20150	1 1/2	102 18 0												* £422 18/4 paid last year, but maps received this year. £46 8/ paid by applicants.	
	Tarras					s. d.	20150	1 1/2	102 18 0													+ £122 10/5 also paid by applicants £21 still to pay on this contract. £26 13/4 still to pay on the contract.
W. Park ..	Leaning Rock					s. d.	8150	1 3	62 18 0												District rough. Surveys scattered. Goldfield.	
	Lower Wamaka					s. d.	82000	82000	1 1/2	462 0 0*												Tharr's map not yet received. Eight months.
M. Barr ..	Macetown					s. d.	20428 1/2	616	8 1/2	7293 3 10											* £422 18/4 paid last year, but maps received this year. £46 8/ paid by applicants.	
	Shotover					s. d.	20150	1 1/2	102 18 0													+ £122 10/5 also paid by applicants £21 still to pay on this contract. £26 13/4 still to pay on the contract.
W. Wilmot ..	Poolburn					s. d.	20150	1 1/2	102 18 0												District rough. Surveys scattered. Goldfield.	
	Tarras					s. d.	20150	1 1/2	102 18 0													Tharr's map not yet received. Eight months.

URN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF WELLINGTON UNDER THE SUPERVISION OF THE CHIEF SURVEYOR AND DEPUTY INSPECTOR OF SURVEYS, FROM 1ST JULY, 1878, TO 30TH JUNE, 1879.

Surveyor.	District.	Minor Triangulation.		Topographical and Trigonometrical Surveys.		Rural and Suburban.			Town Section Survey.			Native Land Purchase Surveys.			Roads, Railways, and Water-races.			Detection by Native opposition, or other cause.	Other Vork.	Totals of Surveyor and Party from 1st July 1878, to 30th June, 1879.		Remarks.		
		Acres.	Cost \pounds Acres.	Acres.	Cost \pounds Acres.	Acres.	No. of Sections.	Cost \pounds Acres.	Total Cost.	Acres.	No. of Allotm.	Cost \pounds Allot.	Total Cost.	Acres.	No. of Allotm.	Cost \pounds Acres.	Miles.			Cost \pounds Mile.	Total Cost.		Cost.	£	s.	d.
E. W. (c)	Ongo Vi., Kairanga Mikimiki				d.	3597	11	3 4	599 1 0	(a) 608	234	1 18 0	441 0 0				(d) 17 5 1/2	3 11 25 9	233 7 0	(c) 69 13 4	835 0 0	739 0 0	Mostly Bush. Bush: fixed 4 new trig stations. Sick three months, and employed one month on work 1877-8. 1877-8. 1/2 bush; rough. 5-6th bush.	
R.	Rewa					4525	18	2 6	665 0 0										180 0 0		840 0 0		840 0 0	
and Cadet	Mikimiki, Tiffen, Waipawa					8175	36	11 1/2	397 15 7										55 0 0		886 0 0		886 0 0	
P. J.	Port Nicholson					1284	6	1 6	96 6 11										80 0 0		(f) 255 0 0		713 0 0	
t. G. A. (p)	Kopuaranga					1340	16	1 6 1/2	104 0 0										232 0 0		(g) 5 16 0		896 0 0	
W.	Rimutaka					5000	28	2 0	500 0 0										60 0 0				875 0 0	
A. J.	Port Nicholson, Mangawhero					5245	110	2 3 1/2	611 0 0										80 0 0				766 0 0	
L. A.	Akatara					1686	13	3 1	259 10 4										100 5 0				776 6 0	
D. & Cadet	Kaitawa, Waitohu																						1226 0 0	
J. and Will.	Waipakura					3905	26	1 11 1/2	382 6 8										100 5 0				1031 0 0	
S. F. and G.	Waioa																						861 0 0	
G.	Waitohu																						154 0 0	
(j)	Tiriraukawa																						613 0 0	
(k)	Waitohu & Waioa					10070	72	1 3 1/2	643 2 4														716 0 0	
(l)	Waioa & Port Nicholson																						869 0 0	
(m)	Port Nicholson																						226 0 0	
(n)	Belmont					260 0 0	216846	2 1	1931 7 9														13738 0 0	
(o)	Mangahao																						1524 12 0	
(p)	Mount Robinson					14500	83	2 0	1450 0 0														355 0 0	
(q)	Onga, Oroua					12000	60	1 5	850 0 0														1524 12 0	
(r)	Mounahaki					5000	1	7 1/2	250 0 0														1343 13 6	
(s)	Grand Totals.					8000	144	1 5 7 1/2	2550 0 0														1277 3 3	
(t)						260 0 0	224846	2 1	1981 7 9														300 0 0	
(u)																							200 0 0	
(v)																							244 16 0	
(w)																							2865 12 9	
(x)																							17103 12 9	

(a) This might be almost termed suburban survey at 14s. 6d. per acre.
 (b) Levelling on Kairanga Block.
 (c) £69 13s. 4d. cost of office maps of Bunaythorpe and Fitzherbert.
 (d) Building stations on the Kaiwhata River.
 (e) Mr. Knowles's work is situated amongst some of the worst surveys in the district.
 (f) Includes office work £120; Inspection of surveys £50; Re-survey £25; Repairs to trig stations £80.
 (g) Native Reserve subdivision.
 (h) Mr. Nothcroft has newly completed survey of 11,419 acres.
 (i) Rough bush, mountainous country.
 (j) Mr. Field has finished field work of triangulation and topography of 60,000 acres at 1d., £264, and boundary survey of 43,000 acres, 25 miles, at £13 8s. 4d.
 (k) Triangulation of 15,000 acres in progress.
 (l) This triangulation included a large area of former work, with stations already cleared and marked.
 (m) Mr. Snowdon commenced a triangulation of Mauriceville District, and has been withdrawn—little progress was made.
 (n) Defined by surveys of H. A. Field and others in former years.

No. 26.

RETURN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF SOUTHLAND, UNDER THE SUPERVISION OF JOHN SPENCE, CHIEF SURVEYOR, FROM 1ST JULY, 1878, TO 30TH JUNE, 1879.

Surveyor.	District.	Topographical and Trigonometrical Surveys.			Rural and Suburban.			Town Section Survey.			Gold mining Surveys.			Roads, Railways, and Water-races.		Other Work.		Total Cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	Remarks.		
		Acres.	Cost $\$$ Acre.	Total Cost.	Acres.	No. of Sections	Cost $\$$ Acre.	Total Cost.	Acres.	No. of Allotm.	Cost $\$$ Allot.	Total Cost.	Acres.	No. of Sections	Cost $\$$ Acre.	Total Cost.	Miles.			Cost $\$$ Mile.	Total Cost.
N. Prentice	Longwood & Waiau Districts	102400	1.18	501 5 8	20900	46	11½	1013 17 0				127	17	2 7 4	300 11 4			1013 17 0	Spotting Surveys.		
John Hay	Longwood & Waiau Districts				6398	41	1 7	505 13 8				190	19	2 12 3	496 10 0	(Cutting connections, &c. to abandon d leases)	50 0 0	974 13 8	Re Mining Leases, weather bad, dense bush, &c. Triangulation in progress 100 square miles. Cost to date £122 16s 8d.		
George Murray	Longwood & Jacobs River Hundred				2118	156	6 1	643 18 11	153	197	12 1	118 19 7				(Railway survey through adjoining Block &c.)	20 0 0	921 3 4	Re reefs lost 2 or 3 months, bad weather, (dense bush) also half of rural surveys in bush.		
William Hay	Jacobs River, New River, Hokonui, & Invercargill Districts				5525	11	1 3	341 18 8	86	35	1 12 2	56 5 8				Alteration of old surveys, and time lost preparatory to removal to Canterbury } (Wet weather &c.)		762 18 6	More than half the acreage in bush. Longriver traverses &c.		
James Hay	Waiau, Waioio, and Lillburn Districts				917	74	11 1½	510 5 2	34	121	9 5	57 0 0						436 13 0	Trans'd to Canterbury end of Dec. '78		
John Innes	Jacobs River, New River, and Winton Lindhurst				1030	1	3½	40 19 7	40	82	8 0	32 16 0						384 4 10	About half the acreage in bush.		
T. B. McNeill	Campbeltown				2748	14	1 0	137 8 0	40	82	8 0	32 16 0						42 13 7	Staff (left end of July) Fee System		
T. B. McNeill	Hokonui				1883	11	1 4½	130 12 6	26	21	13 11	14 12 0						40 19 7	Contract System		
G. F. Richardson	Hokonui				6853	44	1 2½	421 15 10	26	21	13 11	14 12 0						170 4 0	Contract System		
G. F. Richardson	Waiau & Invercargill Districts				6450	13	10½	276 19 7										130 12 6	Fee System		
D. W. McArthur	Waiau				54822	411	0 1 5½	4023 8 11	376	545	13 5	365 6 10						436 7 10	Contract System		
D. W. McArthur	Totals.	102400	1.18	501 5 8									317	36	2 10 3			376 19 7	Fee System		
																		5591 8 8			

URN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF NELSON UNDER THE SUPERVISION OF JOHN S. BROWNING,
CHIEF SURVEYOR, FROM 1ST JULY, 1878, TO 30TH JUNE, 1879.

Surveyor.	District.	Minor Triangulation.			Topographical and Trigonometrical Surveys.			Rural and Suburban.			Town Section Survey.			Gold Mining Surveys.			Roads, Railways, and Water-races.			Other Work.	Total Cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	Remarks.	
		Acres.	Cost $\frac{\text{£}}{\text{Acres}}$.	Total Cost.	Acres.	Cost $\frac{\text{£}}{\text{Acres}}$.	Total Cost.	Acres.	No. of Sections.	Cost $\frac{\text{£}}{\text{Acres}}$.	Total Cost.	Acres.	No. of Allotm.	Cost $\frac{\text{£}}{\text{allot.}}$.	Total Cost.	Acres.	No. of Sections.	Cost $\frac{\text{£}}{\text{Acres}}$.	Total Cost.				Miles.	Cost $\frac{\text{£}}{\text{Mile}}$.	Total Cost.
Thompson	Nelson and Amuri	80020	1-04	£ 431 10 5	14380	1-07	£ 68 9 7	3328	1	6	236 12 5								3	4 0 0	3 0 0	118 16 0	£ s. d.
MacInclair	Collingwood	24500	1	102 1 8	31633	5	659 12 11	3041	18	2/8½	410 5 10								5	8 16 0	44 1 0	151 0 7	868 8 5
Buller	Buller							867	17	2/6	107 2 6								11	8 0 0	88 0 0	172 19 8	707 9 1
Sewell	Grey							1790	8	3/	268 10 0								18	8 0 0	144 8 0	179 17 10	1088 7 1
Montgomery	Grey	48228	1-9	263 4 10				100	2	2/5	12 5 6								13	8 15 3	113 18 8	323 15 4	1081 2 0
Sadd	Grey							2257	23	2/1-8	241 14 6								7	10 6 6	72 2 0	84 8 8	749 14 11
Way	Grey							3560	48	3/	534 0 0								15	8 0 0	120 0 0	213 18 2	942 17 8
Rawson	Nelson							3963	36	2/3	445 16 3								9½	8 0 0	74 0 0	162 18 7	682 14 10
Jennings	Karamaea							2128	54	3/	319 0 0								11½	12 0 0	138 0 0	140 12 6	597 12 6
Edgrass	Lyell, Grey																					110 9 0	153 7 0
Smith	Grey																					107 11 5	
Contractors.																							
Chfort	Buller							4200	56	2/6	525 0 0												525 0 0
Chfort	Amuri							442	19	4/	88 9 0												88 9 0
Chfort	Nelson							631	2	1/	36 13 0												36 13 0
Wis	Collingwood							2000	20	1/3½	130 0 0												130 0 0
Wis	Collingwood							3626	21	1/1	196 8 6												196 8 6
Progress payments on Contracts		152748	1½	796 16 11	46043	3½	728 2 6	37323	307	1/10½	3551 17 6	8½	53	15/7½	40 0 0	1308	69	17/8	1088 14 9	91	68/15/3½	797 9 8	1766 7 9
Total cost of Field work during year																							1431 10 0
																							10200 19 1

910,000 acres Trigonometrical and Topographical survey, and 67,666 acres Rural and Suburban Survey completed in field also.

No. 28.

RETURN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF TARANAKI, UNDER THE SUPERVISION OF THOMAS HUMPHRIES, CHIEF SURVEYOR, FROM 1st JULY, 1878, TO 30th JUNE, 1879.

Surveyor.	District.	Major Triangulation.		Minor Triangulation.		Rural and Suburban.			Town Section Survey.			Roads, Railways, and Water-races.		Detention by Native opposition or other cause.		Other Work.	Total Cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	Remarks.	
		Miles.	Cost \$/mile.	Total Cost.	Acres.	Cost \$/Acres.	Total Cost.	Acres.	No. of Sections.	Cost \$/Acres.	No. of Allotm.	Acres.	Total Cost.	Miles.	Cost \$/Mile.				Total Cost.
Bird, J. and Cadet	Ngaere ..	12	£ s. d. 70 18 7½	851 3 3														£ s. d. 1299 2 0	
Brookes, E. S.	Ngaere ..					3595	74	3 11¼	714 18 0	208	525	14 11¼	283 9 4					£ s. d. 853 4 0	
Cheal, P. E. & Cadet	Waimate and Ngaere ..					4140 2200	74 21	1 11¼ 1 10½	404 18 3 207 9 0	220	602	7½	169 0 0					£ s. d. 918 14 3	
Clintie, H. W.	Waimate and Ngaere ..																	£ s. d. 900 7 2	
Finnerty, C.	Waimate and Ngaere ..					4950 1600	63 24	1 7 2 7½	391 8 8 209 9 8									£ s. d. 849 9 8	
Skeet, H. M.	Waitara and Waimate ..					4500	64	1 11	414 9 6									£ s. d. 838 13 10	
Skinner, H. W.	Ngaere, Huiroa, ..					7100	41	2 0½	718 0 0									£ s. d. 764 17 2	
Anderson, T.	Waitara Waimate Ngaere .. Huiroa ..					4100 1900	67 15	2 0½ 2 9	416 3 0 164 15 4									£ s. d. 915 10 2	
Totals and averages		12	£ s. d. 70 18 7½	851 3 3	54800	33185	443	2 2½	3641 11 5	498	1127	9 11¼	562 9 4	1¼	25 0	31 5 0	381 3 2	£ s. d. 7534 18 3	

17490 acres of rural and suburban in fern and flax country.
15695 acres of rural and suburban forest.

£255 3s. 4d. from last year included in cost of Town Survey.

RETURN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF HAWKE'S BAY UNDER THE SUPERVISION OF HORACE BAKER CHIEF SURVEYOR, FROM 1ST JULY, 1878, TO 30TH JUNE, 1879.

Surveyor.	District.	Minor Triangulation.		Topographical and Trigonometrical Surveys.		Rural and Suburban.			Roads, Railways, and Water-races.		Detention by Native opposition of other cause.		Other Work.		Total cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	Remarks.		
		Acres.	Cost $\frac{\text{£}}{\text{Acres}}$	Acres.	Cost $\frac{\text{£}}{\text{Acres}}$	Acres.	Cost $\frac{\text{£}}{\text{Acres}}$	No. of Sections	Cost $\frac{\text{£}}{\text{Acres}}$	Miles.	Cost $\frac{\text{£}}{\text{Mile}}$	Total Cost.	Cost.	Cost.			£	s.	d.
STAFF	SURVEYORS.																	
W. Hallett	Puketapu		d.	32192	d.					9.2	£ s. d. 10 9 96 4 3		£ s. d. 84 7 10				Other work includes vertical angles of major trig.	
W. Hallett	Mohaka and Moeangiangi					8136	7	243 10 11		11	£ s. d. 10 9 115 3 0		£ s. d. 36 4 9		990	4	10	Connecting old surveys with trig.
W. Hallett	Maungaharuru					732	3 1 1/4	114 2 6		9.8	£ s. d. 10 9 102 7 3		£ s. d. 36 4 10				732A sections bush.	
J. A. Thorpe	Tautane					949	4 4	204 14 0		13.5	£ s. d. 20 0 265 9 3		£ s. d. 66 7 3		526	10	6	Isolated selections in mountainous bush country.
C. D. Kennedy	Pohui Maungaharuru Waitara	5440	£	10 0 0														Other work reconaissance survey 59,000 ac.
J. C. Macfarlane	Tahoraite																	Open mountainous country.
W. Laing	Tarawera					34502	3 1/2	511 11 3		2	£ s. d. 14 0 27 19 6		£ s. d. 91 5 0		328	12	7	Under heading other work is P. works, expenditure, £91 5s.
CONTRACT SURVEYORS.																		
D. Ross	Woodville					3427	4 0	694 8 0		8.8	£ s. d. 14 0 122 4 0		£ s. d. 113 0 4		487	13	6	Public works, £113 0s 4d. Roads unfinished thro' native opposition, £22 14s 10d.
J. Baber, jun.	Tahoraite																	All Bush. Under other work P. works, £55 18s., connecting old work, £173 16s.
A. H. Ross	Ruataniwha	7040	1 1/2	43 6 0		315	3 4 6	71 7 6		20	£ s. d. 11 13 233 3 2		£ s. d. 229 13 0		377	4	0	Open country.
A. H. Ross	Ruataniwha									8.2	£ s. d. 12 18 105 12 0		£ s. d. 94 16 6		315	2	0	All bush. Other work connections from triangulations to old surveys.
L. Lessong	Wakarara and Ngaturoro			170472	68	488 6 7				3.5	£ s. d. 9 0 21 11 10				704	1	10	Old contract from Provincial Govt., returned last year as completed but not paid.
H. Ellison	Pohui Patoka, Kuripapanga, and Kaweka			180736	1 1/2	941 7 7									1307	8	7	Contract No. 3. Not finished.
P. C. Frasi	Woodville																	Contract No. 5 and 6. Not finished. Two vouchers, £229 12s 4d., forwarded but not paid.
Averages and Totals		12,480	1	53 6 0	98	1564 9 6	90	1839 14 2	86	12 13	1089 14 3	30 0 0	741 18 6		6792	10	8	Contract No. 4. Not finished.

No. 30.

RETURN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF WESTLAND, UNDER THE SUPERVISION OF GERHARD MUELLER, CHIEF SURVEYOR, FROM JULY 1st, 1878, TO JUNE 30th, 1879.

Surveyor.	District.	Major Triangulation.		Minor Triangulation.		Topographical and Trigonometrical Surveys.		Rural and Suburban.			Gold mining Surveys.			Roads, Railways, and Water-races.		Other Work.	Total Cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	
		Miles.	Cost Ψ mile.	Acres.	Cost Ψ Acre.	Acres.	Cost Ψ Acre.	Acres.	Cost Ψ Acre.	No. of Sections.	Cost Ψ Acre.	Total Cost.	Miles.	Cost Ψ Mile.	Total Cost.			Cost.
Murray, W. G.	Arabura and Kanieri		d. s. d.	31400	d. s. d.	2710	s. d.	53	s. d.	113	s. d.	1 1/4	s. d.	s. d.				
			2 7-10	358 8 3	2 1	283 2 9	16 3	27	16 3	91 15 0	3 4 0	4 10 0	193 17 0				931 13 0	
Lord, E. J.	Grey			32500	3 1/2	474 19 6	4 6	28	4 6	122 11 0	25 3	24 0 0	135 7 4				756 17 10	
Smyth, J. N.	Arabura and Okariti			34100	1 7-10	238 15 2	3 2 1/2	27	3 2 1/2	158 7 4		7	2 9 3	17 5 0	91 10 0		929 17 4	
Roberts, G. J.	Kanieri, Totara, and Okariti	1 1/4	786 16 3	80450	2 1/2	844 8 0											1581 4 3	
Total Averages		1 1/4	1057 1 3	89450	2 1/2	948 2 10	2 7 8	108	2 7 8	554 1 1	32	17 6	115 15 0	8 1/4	2 12 8	21 15 0	420 14 4	4199 12 5

RETURN OF FIELD WORK EXECUTED BY STAFF AND CONTRACT SURVEYORS IN THE PROVINCIAL DISTRICT OF MARLBOROUGH, UNDER THE SUPERVISION OF H. G. CLARK, CHIEF SURVEYOR, FROM 1ST JULY, 1878, TO 30TH JULY, 1879.

Surveyor.	District.	Rural 3rd Suburban.			Gold Mining Surveys.			Total cost of Surveyor and Party from 1st July, 1878, to 30th June, 1879.	Remarks.		
		Acres.	No. of Allotm.	Cost \pounds allot.	Total Cost.	Acres.	No. of Sections \pounds Acre.			Cost.	Total Cost.
								\pounds s. d.	\pounds s. d.		
A. D. Wilson (standard.)	.....	.....	.....	.....	\pounds s. d.	.....	.....	.....	\pounds s. d. 1201 2 2	Field work of 156000 acres, triangulation.
A. J. C. Ward (authorised.)	Kaikoura Sub. ..	74	6	2/8½	10 0 0	.....	.....	.....	.....	Narrow strip of open land, averaging 5 chains in width along sea-coast, with connections.
A. J. C. Ward (authorised.)	Kaikoura ..	156	2	2/7	20 0 0	.....	.....	.....	30 0 0	Open hilly land.
J. O. Western (authorised.)	Oranmaluta ..	249	12	2/	25 0 0	.....	.....	.....	.....
J. O. Western (authorised.)	Pelorus Sound ..	547	9	2/	53 10 0	.....	.....	.....	114 10 0	This amount is for surveyor and 1 chain-man. Extra labor and boat hire found by applicant, not included.
J. O. Western (authorised.)	Ravencliff Mining ..	1026	29	2/1½	108 10 0	60	4	12/	36 9 0	Expensive district.	
						60	4	12/	36 9 0	1346 1 2	