

SESS. II.—1891.
NEW ZEALAND.

SURVEYS OF NEW ZEALAND.

REPORT FOR 1890-91.

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

SIR,—

Department of Lands and Survey, Wellington, 2nd September, 1891.

I have the honour to furnish the following report on the operations of the Survey Department for the twelve months ending the 30th June, 1891.

The usual extracts from the reports of the Chief Surveyors of the ten land districts, with tables showing detailed information, and two special reports, one on the glaciers of the neighbourhood of Mount Cook, the other on the topographical survey of the neighbourhood of Tongariro Mountain, with illustrative maps, will be found in the Appendix.

The result of the year's output of work is briefly summarised in the following table:—

		£	s.	d.	£	s.	d.
Minor triangulation (without topography) ...	829,187 acres	0	0	0·88	3,027	2	1
Topographical survey ...	595,776 "	0	0	0·35	871	5	2
Topographical surveys for selections under "The Land Act Amendment Act, 1887" ...	207,830 "	0	0	4·53	3,527	13	0
Rural and suburban section surveys (2,283 sections) ...	424,761 "	0	1·22	0	25,931	4	8
Town section surveys (433 sections) ...	436 "	1	6·57	0	575	6	1
Native Land Court surveys (213 blocks) ...	1,091,510 "	0	0·11	0	6,228	4	3
Mining surveys (355 sections) ...	13,821 "	0	5·73	0	3,959	8	1
Roads, &c., 519·03 miles, per mile ...	...	11	1	5	5,751	13	11
Miscellaneous work, detention, &c. ...	...	...	...	...	8,050	17	1
Total cost of field-work finished during the year ...					£57,922	14	4

The total amount spent in the field-work of the department during the year was £56,116 17s. 10d., and the difference between that sum and £57,922 14s. 4d. is partly represented by the field-work over from last season only now taken credit for. The total cost of field-work, office supervision, publication, &c., was £88,998 17s. 5d., from which has to be deducted refunds for services performed amounting to £18,585 14s. 1d., leaving the net cost of the department for the year at £71,413 4s. 2d., or £2,342 15s. 11d. less than for the previous period. The lesser cost during the year is due to a larger amount accruing from refunds than for the previous period.

The average cost of the various classes of work varies little from year to year, though the total expenditure increases or decreases according to the amount of land prepared for settlement, the principal item of cost being of course the rural and suburban lands surveyed. In 1889 the average cost per acre for rural and suburban sections was 1s. 1·4d.; for 1890, 1s. 3·7d.; for this year, 1s. 0·22d.; or an average of 1s. 1·4d. per acre for the three years. Ten years ago the average price was 1s. 4·1d., thus showing an apparent decrease in cost of about 3d. per acre; but this is apparent only, for in order to obtain a just comparison there should be added to the cost of recent surveys a small sum now chargeable to surveys of land for "selection before survey." Were this done the cost for recent years would about equal that of previous years for a long period past. For all practical purposes the cost of surveying lands for settlement may be stated at 1s. 3d. per acre, which is a very moderate price when the completeness and care with which they are done is taken into consideration.

TRIANGULATION AND TOPOGRAPHICAL SURVEYS.

The two first items in the table given above may be grouped under this heading, and it will there be seen that 2,226 square miles have been surveyed during the twelve months, or 346 square miles less than last year; whilst the cost per acre remains very nearly the same, or not quite $\frac{1}{2}$ d.

an acre this year against $\frac{3}{4}$ d. per acre for last year. The principal work consisted in Mr. L. Cussen's triangulation of the country round Tongariro, which was necessary to fill in blanks in the map of that part of the colony, and which work will form the basis of maps to be published for the benefit of the tourist traffic which is expected to follow the opening of the roads now in course of formation. An interesting report by Mr. Cussen will be found in the Appendix. Mr. P. E. Cheal's survey of Piako, undertaken in the interests of Native Land Court surveys, and Mr. Hay's survey of part of Stewart Island, to obtain information as to the suitability of new country for settlement, together with Mr. Broderick's triangulation of part of the Southern Alps, to fill in the topography of that part, are the principal items which go to make up the total. The latter gentleman found time to make some interesting observations on the movements of some of the best known glaciers, as described in his report attached, which will have a permanent value and prove of the deepest interest for comparison in future years.

It is to be regretted that the results of the topographical survey of the colony cannot be made more easily available to the public by publication as is done in most of the countries where a Government survey staff is kept up; but the urgent needs of settlement at present take up the whole time of the small staff of draughtsmen who could otherwise be made available for this purpose. It is probable that New Zealand stands first in the Australian Colonies with respect to the amount and completeness of topographical information buried in its various survey offices, and which is not, as it should be, available for the settler, the miner, the engineer, the traveller, or the local authorities.

SETTLEMENT SURVEYS.

Surveys for "Selection before Survey."—A total area of 207,830 acres was prepared for this kind of selection last year, being about 56,000 acres less than for the previous period. A full description of the methods and results of this class of work was given in the last annual report, which it will be unnecessary to repeat here, other than in brief form. The object is to so lay out roads and delineate ridges, &c., for boundary-lines that the selector can gain an intelligent idea of the land he wishes to select by an inspection of the published maps. The roads are run to standard grades with great care, but the actual survey of them does not partake of final accuracy, this being left to the complete survey which follows, when the area of each selection is known and the marking of the boundaries takes place. The cost per acre for the past period has been about $4\frac{1}{4}$ d. for the survey and plans. Without some such system as this, selection before survey presents great difficulties, and has led in this and other countries to considerable abuses. The greatest colonising state in the world, America, admits of no such system: survey before sale is the universal rule there, and where this can be carried out with expedition it is allowed to be the best and most economical system.

Ordinary Section Survey.—This work embraces the secondary process described above, and includes also all surveys of land prior to sale or selection, the defining of reserves, and everything necessary to the complete record of the divisions into which the country is partitioned prior to the issue of the titles, and the final reduction of the angular measures to the true meridian of the circuit in which the lands lie. The output last year was 424,761 acres, and the cost 1s. 0.22d. per acre. Nearly the whole of this area lies under forest, and a great part of it is of a broken nature, requiring great care and skill in the definition of the road-lines, all of which are on the standard grades laid down by law. In all cases the work is checked and controlled by the district triangulations, and the results—due in a great measure to the modern appliances for chaining—are such that little fear of conflicts as to boundaries may be anticipated in the future. The number of sections surveyed was 2,283, with an average area of 185 acres, or 11 acres less than the average of last year. The largest area in any one district (114,564 acres) was in Wellington, with an average-sized section of 363 acres, whilst the largest number of sections surveyed was in Auckland, where the average size of holding was 121 acres. Nelson seems to favour the smallest holdings of any part of the colony, where the average for last year was 81 acres.

The department has still on its hands a considerable amount of work in the definition of back boundaries of sections disposed of during previous years; but it is a decreasing quantity. Some of the staff are constantly kept at this class of work, so that there are chances of this liability being worked off within a reasonable time. The demand for lands for settlement shows no sign of abating, and therefore, with your approval, it is proposed to obtain some extra help during the summer months to keep the surveys up with the demand. Much of the back forest country, which a few years ago would not be thought of for settlement, is now inquired for, and, with the construction of roads giving access to it, would be readily selected. The North Island must be looked to to supply the demand, for here alone is there any extent of Crown land left of a quality suitable for close settlement, and that quantity is limited. The acquisition of more lands for settlement, and the necessary "roading" to make them accessible, are the two works which will most tend to the prosperity of the colony at the present time.

NATIVE LAND COURT SURVEYS.

The surveys undertaken by the department, or for which the department advanced the cost, employing the authorised surveyors to do the work, amounted to 1,091,510 acres, the greater part of which lies in the King-country. This area is in 213 blocks or divisions of varying size, and the cost amounted to 0.11s. per acre. This does not, however, represent so much new country for the first time prepared for the operations of the Court, but includes within it the subdivisions of blocks the tribal or communal titles to which had formerly been decided, and which during the year came in for further division, as it, or part of it, may do again before it is finally individualised or transferred to Government or European hands. In addition, the authorised surveyors surveyed 367 blocks or divisions, containing 328,126 acres, at the cost of the Native applicants, or of the European purchasers from them, all of which work is done under the direction of the department in

the same manner as the Government surveys. There was thus a total area of 1,419,637 acres prepared for dealing with by the Court, or which had been so dealt with, and made ready for the issue of titles.

Owing to causes over which the department has no control, the arrears of surveys to carry out the orders of the Court made during the course of many years past are very heavy, and are a constantly-increasing quantity. The Maoris themselves are very ready to apply to the Court for the subdivisions of their lands, but on having attained their wishes in this respect are very frequently unable to find the means to carry out the surveys, which should follow at once. Hence, subdivision orders frequently remain for years in a state of incompleteness, and still go on accumulating, so much so that the date of final issue of all the titles is a matter of great uncertainty.

GOLD AND OTHER MINING SURVEYS.

There is a noticeable decrease in the area of these surveys made by the department during the past period, the figures being—1890, 21,467 acres, in 608 divisions; 1891, 13,821 acres, in 355 divisions. This decrease is pretty generally spread through the mining districts. In all cases the fees are deposited by the applicants before survey; and the work is sometimes undertaken by the staff and sometimes by the authorised surveyors specially engaged. It is generally expensive work, due to the fact of the scattered localities in which the claims lie, and to the intermittent nature of the applications, which frequently involve lengthy journeys for the sake of marking out a single claim.

ROAD AND RAILWAY SURVEYS.

The mileage of roads surveyed during the past year has increased a good deal, being 519 miles, as against 408 for 1890, and the cost is somewhat greater also. These surveys represent cases in which the rights under the grants had to be exercised, or the taking of roads through Native lands, legalising old roads, and the laying out of roads not included in the section surveys. In many cases information is also obtained for the preparation of specifications for actual construction, so that the mean cost per mile for the year—£11 ls. 5d.—cannot be looked on as high. Great care is taken in locating these roads in the best places in the public interest, so as to secure workable grades and the most advantageous lines of communication. The difficulties the surveyors have in securing these *desiderata* are very considerable, and an inspection of any of the modern survey plans will show at once that the country we now have to deal with is anything but suitable for long straight lines.

MISCELLANEOUS WORK.

Grouped under this heading are the numerous and necessary surveys carried out by the department which do not admit of a tabular classification. They consist of explorations, reports on new country, field inspection, all kinds of odd surveys and other duties performed, equally important with the other work of the department, but not making so great a show. Included within this class of work is the cost of obtaining reliable results as to the variation of the needle in different parts of the colony, which had not been observed in any comprehensive manner since the Admiralty survey, ending about 1851. The results, however, are not ready for publication this year.

CONSTRUCTIVE WORKS, ROADS, BRIDGES, ETC.

A very large amount of the constructive works of the department are under the immediate direction of the Chief Surveyors, aided by inspectors or overseers, and occasionally assisted by the surveyors. In addition, there is a special staff of six road surveyors, whose work is of a more general character, and whose duties are directed by the Head Office. The works consist generally of the construction of roads, either dray-roads or bridle-roads, to open up the Crown lands prior to sale, the formation of main lines of communication (especially in the North Island), and the maintenance of several of the main roads which lie outside the operations of the County Councils. In many cases where the County Councils have engineers of their own the department is glad to avail itself of their help in any of the above works, and a considerable amount of work has been done under the counties during the past year, the plans and specifications, as a rule, having been first passed by the department.

The following is a summary of the works completed out of the votes under the charge of the department during the year, details of which will be found in the attached reports for each district:—

	Miles.
Roads graded, not included in the items below	227·55
Dray-roads formed	100·56
Bridle-roads formed	76·14
Dray-roads improved	71·58
Bridle-roads improved...	33·77
Dray-roads maintained	571·32
Bridle-roads maintained	186·0
Total length of bridges formed, 1,804ft.	

It will thus be seen that 182 miles of road have been formed, nearly all of it bush country; and that the maintenance covered 757 miles, in which are included some very important lines of communication in different parts of the country. During the year the Tongariro Bridge was completed, which is a fine structure built over the Upper Waikato River, near Tokaanu, and on a line of road which, within a year or so, will become one of the most popular in the North Island. The Public Works Department supplied the design.

In addition to the works enumerated above, nearly all of which tend to open the Crown lands for settlement, may be added the works undertaken by the local bodies with the same view, the

cost of which is defrayed by the "thirds" from the deferred-payment land sales, the thirds of rents of perpetual-lease lands, and "fourths" from small grazing-run rents. The total amount paid over by the department to the local bodies for the twelve months was £25,739 15s. 5d.; and before any expenditure takes place the Land Boards of the various districts have to approve the works on which the money has to be spent. The smallest land district of the ten into which the colony is divided received one-third of the total amount. The money in all cases has to be spent in forming or improving the means of communication to the lands from which the revenue is derived, and it forms a useful addition to the rates raised by local Boards.

DEPARTMENTAL.

In the month of April the following changes were made in the stations of Chief Surveyors in charge of districts: Mr. T. Humphries from Auckland to Hawke's Bay, Mr. G. Mueller from Westland to Auckland, Mr. G. W. Williams from Hawke's Bay to Southland, Mr. J. W. A. Marchant from Wellington to Canterbury, Mr. J. H. Baker from Canterbury to Wellington; Mr. J. Spence, of Southland, retired; and Mr. J. Strauchon was promoted from senior District Surveyor to be Chief Surveyor and Commissioner of Crown Lands at Westland. At the same time the Lands and Survey Departments were amalgamated more closely all through the colony, and the name of Department of Lands and Survey adopted for the whole, the late Under-Secretary for Lands, H. J. H. Elliott, Esq., being transferred to the Mines Department.

During the year the department lost the services of Mr. F. H. Edgecumbe, one of the best surveyors in the service. Mr. Edgecumbe died on the 16th May. Mr. J. A. Cullen, another excellent young officer, died during the year. Mr. H. Lakeman, for many years Chief Clerk of the Survey Department, retired in February last, Mr. H. Boscawen being promoted to fill his place. Under the direction of the Government a considerable reduction took place in April last, two of the staff draughtsmen and a number of the draughtsmen temporarily employed were dispensed with. One of the cadets, Mr. J. D. Thomson, passed on to the grade of assistant surveyor.

The strength of the department was on the 30th June, 55 surveyors, 6 road surveyors, 62 draughtsmen, 13 cadets, 11 clerks, 1 accountant, 1 photographer, 5 litho-printers, all on the permanent staff, besides several surveyors and draughtsmen temporarily employed.

The department and the colony suffered a most severe loss during the year in the destruction by fire of the lithographic office, a loss which it will take many years to make good, and which has thrown us seriously back in the work of the publication of maps of the colony.

Mr. Barron's report on the photolithographic and other branches of the department is appended hereto.

I have, &c.,

S. PERCY SMITH,
Surveyor-General.

The Hon. J. McKenzie, Minister of Lands.

HEAD OFFICE.

THE work in this office has increased very much during the past year, and the quantity and variety of complex subjects is very great. It has been found desirable to administer some of the road construction in the North and South Islands directly from Wellington, instead of through the Chief Surveyors as hitherto. This has entailed the preparation of plans and contracts in this office, and the letting and dealing with such contracts. The amalgamation of the Lands and Survey Departments in April last immediately increased the duties of the Head Office by the addition thereto of the whole of the administrative work of the Lands Department.

The correspondence amounted to 9,788 letters and papers received, and 5,640 despatched, or a total of 15,428, as against 13,700 last year. The increase in the work consequent upon the amalgamation mentioned is clearly shown by the fact that, whereas there were only 915 letters despatched from the 1st of April to the 30th of June last year, there were 2,974 during a corresponding period this year.

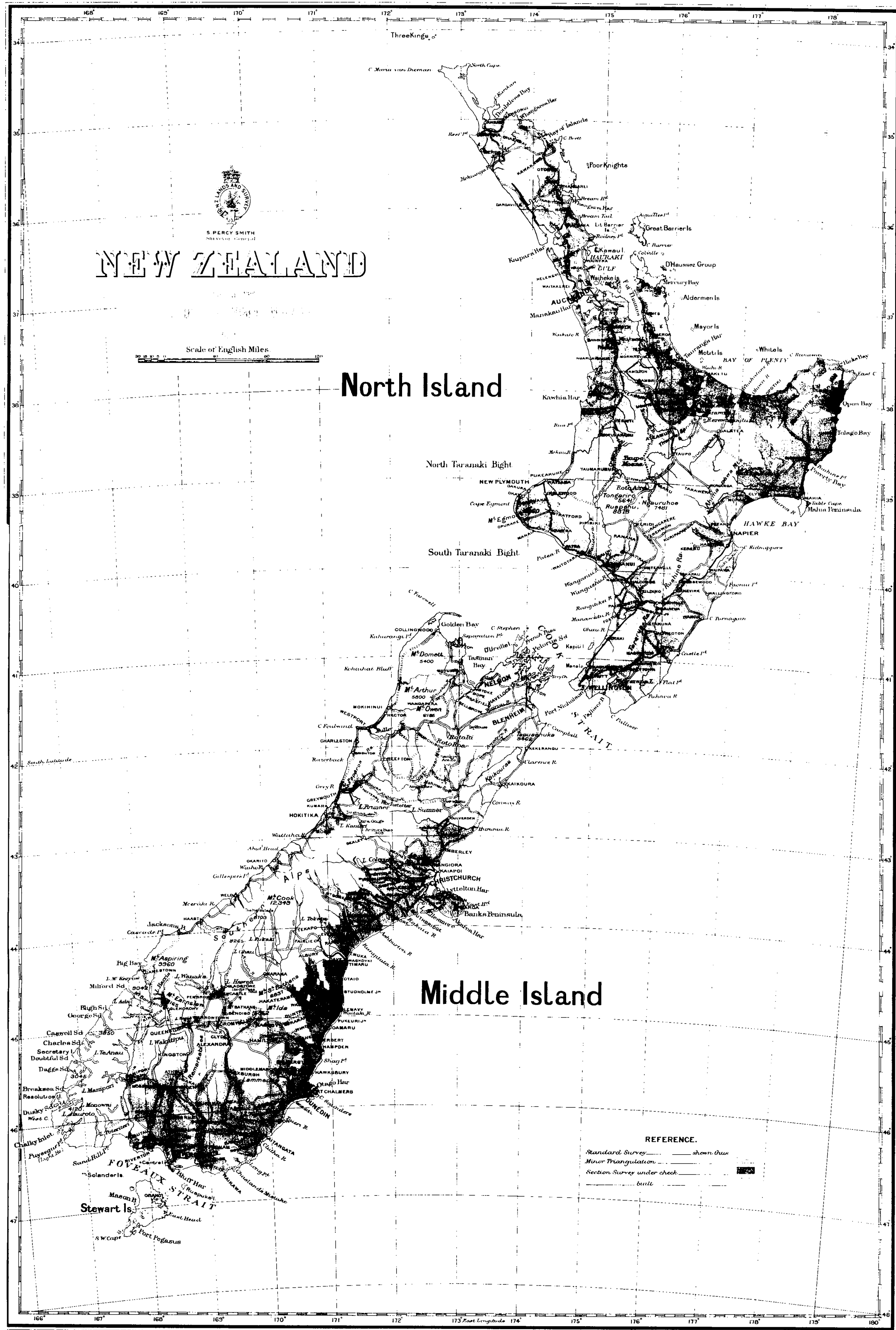
Sixty-seven Proclamations and Orders in Council were issued, taking land for roads and other public works for local bodies, and 35 warrants were issued to take land for roads under Native Land Court Act, &c.

The number of vouchers for expenditure on survey and road works amounted to 9,110, representing an expenditure of £149,275, as against 8,882 for £155,549 last year. In addition to these vouchers a great many small accounts, amounting in all to £3,500 for Crown lands services, were passed between April and June.

There were 80 agreements with local bodies for road works prepared during the year, representing grants to the extent in all of £17,782.

The publication of maps and plans of all sorts has largely increased. Of maps on 80-chain scale, 2 district maps and 3 sheets of Cook and Wairoa Counties were published, and 10 maps are awaiting completion. Twenty sale plans were published, 849 census maps were prepared, mounted and attached to 745 sub-enumerators' books; 98 descriptions of boundaries of districts, &c., were prepared, 57 schedules and 61 plans of land to be taken under Public Works Acts have been checked, 502 plans of roads to open up North Island Main Trunk Railway were traced, and specifications of works prepared, and of this number plans representing 19 miles of road were wholly prepared in this office from the Engineer's notes.

A map of the colony on a scale of 40 miles to an inch has been drawn on stone, and progress has been made with the republication of the geographical maps of Canterbury and Otago, the previous work having been completed on stone at great expense just before the fire occurred in the litho. office.



Control network

Middle Island

REF ID: A64032

1. *Explain the importance of the following factors in the development of a country's economy:*
 (a) *Human resources*
 (b) *Capital resources*
 (c) *Technology*
 (d) *Infrastructure*
 (e) *Government policy*
 (f) *International trade*
 (g) *Investment*
 (h) *Education*
 (i) *Healthcare*
 (j) *Environment*
 (k) *Democracy*
 (l) *Corruption*
 (m) *Religion*
 (n) *Culture*
 (o) *Language*
 (p) *History*
 (q) *Geography*
 (r) *Climate*
 (s) *Soil*
 (t) *Water*
 (u) *Energy*
 (v) *Transport*
 (w) *Communication*
 (x) *Finance*
 (y) *Law*
 (z) *Justice*
 (aa) *Peace*
 (ab) *Stability*
 (ac) *Unity*
 (ad) *Cooperation*
 (ae) *Competition*
 (af) *Innovation*
 (ag) *Research*
 (ah) *Development*
 (ai) *Growth*
 (aj) *Progress*
 (ak) *Success*
 (al) *Failure*
 (am) *Challenge*
 (an) *Opportunity*
 (ao) *Risk*
 (ap) *Uncertainty*
 (aq) *Complexity*
 (ar) *Interdependence*
 (as) *Globalization*
 (at) *Integration*
 (au) *Fragmentation*
 (av) *Isolation*
 (aw) *Connectivity*
 (ax) *Network*
 (ay) *System*
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 (iu) *Model*
 (iv) *Framework*
 (iu) *Structure*
 (iv) *System*
 (iu) *Method*
 (iv) *Technique*

21 June 2002

NEW ZEALAND

SHOWING THE
ROADS TO OPEN CROWN LANDS FOR SALE
SURVEYED & CONSTRUCTED DURING 1881-1891.

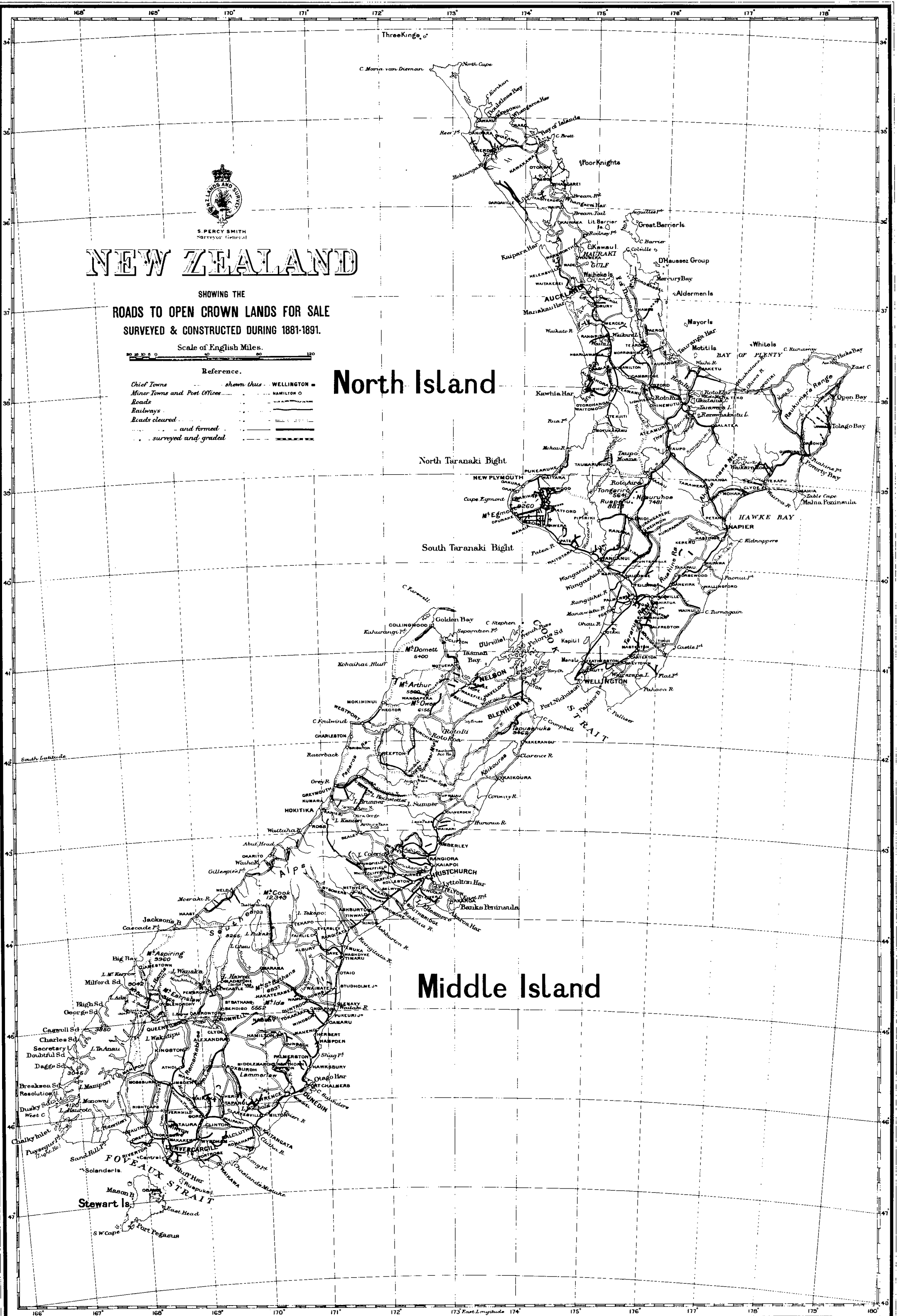
Scale of English Miles.

Reference.

Chief Towns shown thus - WELLINGTON -
Minor Towns and Post Offices - HAMILTON O
Roads -
Railways -
Roads cleared -
and formed -
surveyed and graded -

North Island

Middle Island



Maps of Eden County, showing the smallest subdivisions, are almost ready for issue.

In October last the department sustained a heavy loss in the destruction by fire of the photo. gallery and the whole of the building used as a litho-printing office. We were fortunate in having two presses at work in another building, and so were able to carry on urgent work until a shed was erected over the machines, and a new temporary gallery was built. In these quarters and in two other separate places the work of that branch has been carried on at some disadvantage, which it is hoped will be removed by the erection of suitable premises now designed.

The loss in plant and stock was not less than £3,100; but the chief parts of the printing-machines and engine being unaffected by the fire, were restored in a few weeks, and are now in fairly good working-order. We, however, lost two fine cameras, including the 30in. one recently imported, and of course our large stock of stones, plates, maps, and material was utterly destroyed, with much work upon the stones which can never be replaced.

There were 358,088 impressions taken from stone as far as can be ascertained—viz., 325,344 by machine and 32,744 by hand—but the return is not complete for the machines, as the records were destroyed in the fire. Printing was done for twenty-one departments, 650 stones were used, 2,090 maps and tracings were mounted, 379 negatives were taken, and 143 silver and bromide prints and eleven transparencies were made in the photo. gallery during the last seven months.

The increased demands mentioned in this report have necessitated much night-work being performed by many officers of the department, and I have pleasure in stating that all of them have performed their duties heartily, have kept their work up to date, and have done it well.

A. BARRON, Superintendent.

APPENDICES.

APPENDIX No. 1.

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

AUCKLAND.

Topographical Survey.—An area of 320,000 acres is included under this heading, costing £170 16s. 4d., or a mean of 0.12d. per acre. Of this amount some 295,000 acres covers the area of the topographical survey lately made by Mr. L. Cussen over Mounts Tongariro, Ngauruhoe, and their vicinity. It has been long felt that, in the interests of geology and also in the interests of the increasing number of tourists visiting the colony, it was expedient to complete this work, which had been long in contemplation, but delayed owing to press of other surveys. However, advantage was taken at last of Mr. Cussen's presence in the neighbourhood, whilst inspecting extensive land-purchase surveys, to carry out this important work, and which, with his usual energy, he has successfully completed, together with the elaborate report, diagrams, and sketches I have already transmitted to you. The balance of the topographical area was completed by Mr. H. D. M. Haszard for settlement purposes, and for the purpose of throwing open the land as "unsurveyed."

Triangulation.—An area of 529,864 acres, costing £893 0s. 10d., or a mean of 0.4d. per acre, has been completed under this heading. Of this work, some 350,000 acres were done under contract by Mr. P. E. Cheal, for the purpose of covering the large extent of Native land lying between lower Waikato and the Thames, with a series of fixed points within which the numerous land-purchase and Native surveys undertaken in the Piako Block for Native Land Court purposes could be connected. Mr. Cheal had to contend with a good deal of Native opposition owing to tribal jealousies, and had to submit to the pulling-down of trig. stations just as they were erected, and then had to await their re-erection before obtaining his angles.

The close between the Waikato and Thames series is not as good as it should be, but some allowance must in fairness be made for an error known to exist in the original triangulation, which extends to the Thames along the coast-line, and that by necessarily not very well conditioned triangles at the entrance of the Thames River. The balance of area has been contributed by Messrs. Hardy, Martin, and Haszard, who had to break down for settlement-survey purposes, and Mr. Wm. Cussen in the Taupo district, by Ray Trace for Native Land Court and Native land-purchase purposes.

Rural Sections.—A very considerable area has been surveyed and subdivided during the past year, having a grand total of 95,597 acres, costing £6,668 6s. 6d., or a mean of 1.39s. per acre, which is considerably below the mean cost per acre of last year's return. Of the grand total just given, some 731 sections, with an area of 73,308 acres, have been executed by the staff at a cost of £5,202 0s. 10d., or a mean of 1.42s. per acre; and the balance of sixty sections totalling to 22,289 acres, and costing £1,466 5s. 8d., or a mean of 1.31s. per acre, has been undertaken by authorised surveyors, and paid for at schedule rates either by Government direct or by the survey-fees being deposited by applicants for "unsurveyed" lands opened by Proclamation. Of this latter class of surveys, the surveyors employed are nominated by the persons making the applications, and are always accepted provided the surveyor so nominated is on the duly-authorised list furnished by the Surveyor-General. It may be as well to mention that in the area of schedule-surveys are included five sections under the homestead clauses of the Land Act, containing 985 acres, and costing £102. Taking the total number of sections and areas surveyed for settlement purposes during the past year, we find that the 731 sections have an average of less than 121 acres each, and that in no case has the area of any one section exceeded 2,000 acres, and that as a matter of fact only four sections of such an area have been surveyed or applied for during the past year. The return of work would have been larger still had not severe illness of Messrs. Harington and T. L. Humphries and the death of Mr. Edgecumbe deprived us of the services of no less than three staff-surveyors.

Town Sections.—There have been surveyed under this heading during the past year 199 lots, containing an area of 194 acres, and costing £266 12s. 7d. They comprise the re-survey of the Town of Russell—a costly and difficult undertaking owing to the erratic manner in which the Crown-granted holdings have been fenced in, and the absence of old and reliable marks. Mr. Wheeler carried out this work in a skilful and intelligent manner, and we have been enabled, after many years of "groping," to produce a reliable land-tenure map of the township. The other town surveys comprise goldfields Town of Kuaotunu, by Mr. J. I. Philips; and Village of Paengaroa, by Mr. J. Baber, jun.; and a village site near Maungakaramaea wharf, by Mr. C. Stevens. It may not be inappropriate to mention in this place that, between his periods of severe illness and almost up to the day of his death, the late Mr. F. H. Edgecumbe was engaged upon the revision of the standard survey of the City of Auckland and suburbs and the street alignment, which, with the assistance of Mr. Warner, jun., an authorised surveyor, he had nearly brought to a successful close—in fact quite so, as far as the standard survey is concerned. Mr. Edgecumbe, one may truly say, died in harness, and the department has by his death been deprived of an exemplary and painstaking officer, of one whose loss is severely felt. Mr. Warner is now entering up the com-

putations, and will then proceed to plot all the standard work, so that the office may not be deprived of the results of Mr. Edgecumbe's labours.

Native Land Court and Native-land Purchase Surveys.—Under this heading, during the past year, a total area of 1,039,558 acres has been actually surveyed and mapped, and the greater portion also recorded upon our office records maps. The area enumerated above is divided as follows: Native Land Court surveys executed in the King-country, costs of survey of which have been advanced by Government, thirty-seven blocks, containing an area of 995,727 acres, and costing £4,651 4s. 8d; Native-land purchase surveys, cost of which has been paid by Land Purchase Department, ten blocks, containing an area of 43,554 acres, and costing £604 16s. 1d., and situated in the Thames, Coromandel, and Taupo districts. The survey of the subdivisions of the King-country blocks is not yet completed, and some very large subdivision areas have yet to be dealt with, such as the Kinohaku East and West Blocks, Taorua Block, &c., which will probably be in hand during the coming season. The department has already in hand, and almost completed in the field, some twenty-seven blocks, containing 203,941 acres, chiefly land-purchase surveys, there being only 4,815 acres of this amount situated within the King-country Rohe Potae. In addition to the area paid for by Government, there have been received for examination and record in this office maps of some 117 blocks of Native Land Court surveys for adjudication upon by the Court, containing an area of 49,642 acres, the cost of which has been paid for, mostly at schedule rates, by the Native owners, and which does not pass through our books. This work is subjected to the same rigid check as the Government surveys, and takes up a large portion of the draughtmen's time.

Gold-mining Surveys.—The number of sections of licensed holdings received and recorded during the past year has been large, consisting of no less than 201 separate plans, containing a total area of 4,225 acres, and costing £1,718 10s. 6d. These surveys as a rule are very carefully performed, and are very creditable to the surveyors engaged upon them. In accordance with your instructions no charge has been made against the Goldfields Department for this work, which has taken up the greater portion of one draughtsman's time.

Roads and Railways.—Under this heading the staff have surveyed some 98 miles of road, at a cost of £1,163 5s. 10d., or under £12 per mile. Of this amount, Mr. F. Simpson has surveyed and graded some 17 miles in the Whangarei district, mostly through Native blocks, or in exercise of road rights in grants. Mr. J. I. Philips has explored, surveyed, and graded some 35 miles to open up lands for settlement in the Awaroa and Whaingaroa districts, extending through the country at the back of Lake Whangape, &c.; and Mr. Vickerman has surveyed and graded some 10 miles through forest to open up Crown lands in the Tauhoa district. The balance of mileage has been contributed by Messrs. Galbraith, Haszard, and others of the staff. In addition to the staff surveys Mr. Holt has surveyed some six miles of the Kaihu Valley railway, from Maropiu to Waimanu, at a cost, with connecting road, of some £70. There have also been received from authorised surveyors, taken in exercise of road rights through Native lands, some 17 miles of road.

Other Work.—A total of £1,164 11s. 1d. is set down under this heading, and comprises inspection of Native Land Court and land-purchase surveys by Mr. District Surveyor L. Cussen; cost of city, standard, and alignment surveys—not yet completed—by the late Mr. Edgecumbe. The remainder is chargeable to reports upon roads, reports upon timber, and reports on improvements to sections and other matters referred from the Land Board to the staff surveyors, comprising duties too numerous to enumerate.

Land Transfer Work.—The work under this heading has been of limited quantity. Mr. Foster has examined and submitted for approval 107 plans, comprising 503 subdivisions, and containing an area of 10,174 acres; and Mr. Sturtevant, up to the time of his retirement from this office, had received, examined, and passed 59 applications to bring land under the Act, and also had prepared in duplicate 410 certificates with marginal plans, containing an area of 69,754 acres; the total cost of both branches being £750. The following is the summary of work received and in hand:—

				Completed during the Year.		In Hands of Surveyors.	
Triangulation	...	...	...	529,864 acres	...	Nil	
Rural sections	...	...	...	95,597 "	...	98,423 acres	
Town surveys	...	...	...	199 sections	...	Nil	
Native Land Court and Native land purchase paid by Government				1,039,558 acres	...	203,941 acres	
Gold-mining	...	...	...	4,225 "	...	Nil	
Roads, &c.	...	...	...	104 miles	...	77 miles	

In addition to the 98,423 acres of settlement surveys in hands of surveyors there are some 33,000 acres still applied for in various-sized sections, but I am unable as yet to put it in the hands of the staff for survey.

Work for Ensuing Season.—The coming season will be taken up by an endeavour to overtake the arrears of section survey in the hands of the staff and also remaining in my work-book. I do not anticipate that there will be much work in the shape of triangulation other than what will be necessary for connection with triangulation of isolated surveys. Mr. Simpson has some in hand in the Whangarei district, principally an extension of the minor triangulation to fill in the gap towards Ngunguru and Tutukaka, and Mr. Galbraith will have to break down some triangles in order to connect his subdivision work now in progress in the Waiawa district. *Bond fide* settlement is progressing apace both north of Auckland and in the Counties of Raglan, Tauranga, and Whakatane, and I am certain all the energies of the field staff will be called forth to keep pace with requirements.

Office-work.—The work in this department has been very heavy and continuous, and the draughting staff (large as it is) can hardly keep pace with the work of recording the numerous Native Land Court and section surveys continually being received. I am glad to say that all our county

maps have been compiled, the last one—Taupo East—having just been completed. The complete amalgamation of the Lands and Survey Office has not been effected without entailing a considerable amount of extra and over-time work on the part of some of the clerks, and I cannot refrain from mentioning that great credit is due to Mr. Johnston for his energetic efforts in this direction. I am glad to state that our certificates of titles, Crown grants, and leases are well up to date, and the Chief Draughtsman has brought under my notice the able way in which Mr. Kallender has performed his duties of Crown-grant Draughtsman under his direction. The number of certificates of title, perpetual leases, and deferred-payment plans have been 2,181 marginal plans, of an area of 158,708 acres; and of Native titles, including land purchase deeds and partition orders, 293 marginal plans, of an area of 327,330 acres.

The lithographs drawn and printed during the past year have been 24, equalling 3,900 copies, and costing for drawing and printing £163 10s. 6d., whilst the fees received for sale of lithographs, &c., have been £87 1s. 6d.

GERHARD MUELLER, Chief Surveyor.

TARANAKI.

Topographical and Trigonometrical Survey.—Nothing has been done under this heading during the year.

Topographical Survey for Selection under "The Land Act, 1887," including grading roads.—At the beginning of last year Mr. Finnerty, contract surveyor, commenced the survey of roads through the Mangaere and Mangaotuku Blocks, with a view to bring about 9,000 acres into the market, but after the roads were completed it was decided to have the blocks subdivided into sections, ranging in area from 100 to 500 acres, prior to selection. Up to the present nothing further has been done on the ground. In February last Mr. John Annabell was employed on contract to prepare about 10,000 acres in the Upper Waitotara district. He has up to the present graded and surveyed 11 miles of roads, and expects to have his present contract completed about September.

Rural and Suburban.—Mr. Skeet has subdivided 12,500 acres in the Mimi district into twenty-one sections; and Mr. Dalziell 10,084 acres in the Huiroa district into thirty sections at a cost of a fraction over 1s. per acre, which is, I think, an exceedingly low rate for heavy forest country. Some of the sections are, no doubt, large; but, on the other hand, the roughness of the country in places necessitates the expenditure of more time in the exploration for and location of road lines than was necessary formerly in the more level portions of the district. Sixteen hundred and fifty-two acres at Ngatimarū, on the Otaraoa road were subdivided into five sections by Mr. Davies, on contract, at a cost of 2.24s. per acre. The large number of short lines on the roads, which were pegged on both sides at every angle, added considerably to the cost of the work.

Town Section Survey.—No surveys have been made under this heading, although sites for future towns have been reserved on the Pukearuhe—Mangaroa and on the Stratford—Mangaroa Roads, which at no distant day will have to be sectionised.

Native Land Court Surveys.—The resurvey and subdivision of old Native reserves have been completed by Mr. T. K. Skinner in a most satisfactory manner; and as soon as the plans have been approved by the Judge they will be endorsed on the orders preparatory to the issue of certificates to the grantees. In addition to the above, authorities have been issued to Messrs. H. W. Climie, C. Finnerty, E. F. Tole, G. Sole, and R. H. Davies for an aggregate of 64,933 acres; the cost of survey to be paid by the owners. Of this area only 300 acres—by Mr. Climie—has been completed.

Native Land Purchase Surveys.—Mr. John Skinner is still engaged surveying the Whitianga, Taumatamahoe, and Maraekowhai Blocks, in the Upper Wanganui district; which, with some reserves to be cut out of the Opatu and Retaruke Blocks, amount in area to 180,530 acres. They should be completed in the course of three or four months.

Roads, Railways, &c.—Mr. Buckeridge has explored 32 miles of road, sixteen of which have been graded—being an extension of the Rotokare Road to the Pohokura Block, and the extension of the Wingrove Road, through the Pukengahu Block, to the Mangamingi—at a cost of £3 18s. per mile. A copy of Mr. Buckeridge's report on the former line was forwarded to you at the time. Mr. Davies graded, and made a compass survey of 11 miles of the junction road from Purangi to the Stratford route, at a cost of £10 per mile.

West Coast Commission Surveys.—Three reserves—Te Nau, Manutangihia, and Ngakorako—have been surveyed in two sections at the Upper Waitara by Mr. Davies, containing 600 acres in all; he also surveyed 3½ miles of road to and through them.

Other Work.—This includes harbour soundings and scattered surveys by Mr. W. H. Skinner of the office staff, and observations for variation by him and me; also the construction of fifteen tripod signals—of approved hard wood, sawn, and painted white—at trig. stations around New Plymouth.

Land Transfer Surveys.—Fifty-eight plans, comprising 4,911 acres, in eighty-two sections, have been examined, all of which have been passed, and the work of this branch is up to date.

Field Inspection.—I have during the year visited all the staff surveyors at their camps, and inspected the country under survey by them. I also, in company with Mr. Skeet, crossed over the watershed, from the Mimi to the Waitara River—which we came down in a canoe—and from the Moki Stream to Purangi, Mr. Skeet making a compass sketch of the river as far as Te Nau, as this portion had not before, as far as is known, been navigated by white men. I have also inspected the contract and Land Transfer surveys scattered throughout the district, as mentioned in my monthly reports. With regard to the latter class of surveys, while in the majority of cases they have been conscientiously performed in one or two, I regret to say, there was not the care exercised in proving the position of old and doubtful points, and in ground-marking, which there should be in such cases.

Office-work.—The office staff has checked 26 surveyors' plans, compiled 32 plans, including

12 county maps; made 402 tracings of various sizes, checked 151 traverse sheets, drawn four tracings for photo-lithographing; put plans on 122 Crown grants and leases (in triplicate), representing an area of 23,271 acres; and on 157 certificates of title (in duplicate), dealing with 55,779 acres. The posting up for of the triangulation records in the books printed for the purpose has been most satisfactorily performed by Mr. Douglas, who has had to recompute a large portion of the older and more doubtful work in order to bring it into "terms" with that which had been finally determined.

Work for Next Year.—As well as can be forecast at present, the field-work for the ensuing year will consist chiefly of subdivision for settlement in the Egmont, Ngatimaru, Huiroa, and Ngaere Survey Districts by three members of the staff. Mr. Buckeridge's subdivision of Mangamingi, if not retarded, should be completed by September. The subdivision of Mangaere and Kaimanuka lands, by Messrs. Finnerty and Annabell respectively, on contract, will, I presume, go on. Mr. Bullard, Assistant-Surveyor, who has just been transferred from Nelson, will be employed in surveying roads, under warrant, through the Toko, Huiakama, Matemateonga, and other blocks. It is unnecessary for me to reiterate what I have said in previous reports as to the advisability of standard and alignment surveys of the larger towns being made before permanent buildings are erected, &c.

In the office we have an ever-increasing amount of arrears piling up, as detailed in my return, furnished some months ago. It will be noticed that not a single block sheet was prepared during the past year, against nineteen got out the previous year; and little or no progress has been made with the Land Transfer record-maps. This does not arise from any lack of energy or industry on the part of the staff, who, on the contrary, I am happy to say, both as regards the field and the office, are most desirous of doing their utmost, but rather from the fact that the current work taxes their best efforts to keep it up to date.

SIDNEY WEETMAN, Chief Surveyor.

HAWKE'S BAY.

Triangulation.—Of minor triangulation 17,400 acres have been executed at a cost of slightly over $\frac{1}{2}$ d an acre. This was found necessary to govern the settlement surveys now being carried on in the Motu Country. The field-work of an additional 12,000 acres in the Mohaka district has been finished, but the mapping of it is not done.

Topographical Survey for Selection under Land Act of 1887.—Two blocks in the Mata and Motu Survey Districts, of 29,800 acres in extent, have been prepared by Messrs. Price and Neill, and are now offered for selection; and another, with an area of 17,600, situated near Waikaremoana Lake, has been completed by Mr. Mountain, and is now about to be thrown open. The average cost per acre is $5\frac{1}{4}$ d., which is very reasonable, as it includes the expense of grading and traversing the necessary road lines, and much of the boundaries. In addition to the foregoing completed work, a further 129,000 acres in the Motu, Waikaremoana and Nuhaka North districts are in the hands of the surveyors. At the present time 25 miles of road have been located, and a survey of 40,000 acres is nearing completion. The weather of late has been so bad in these localities that it has been found necessary to withdraw the parties for a time.

Rural and Suburban.—Under this heading eighty-seven sections, comprising 23,024 acres, have been surveyed at a cost of 10d. an acre; but, as the greater part is the subdivision of blocks that appeared in last year's return under "Topographical Surveys for Selection under Act of 1887" as having cost 6d. an acre, the actual expense from first to last on the 23,024 acres now returned is at the rate of 1s. $3\frac{3}{4}$ d. an acre.

Native Land Court Surveys.—There have been 2,962 acres in two blocks surveyed by the staff, at a cost of £54 15s., equivalent to $4\frac{1}{4}$ d. an acre. Thirty-four blocks, with a total area of 25,346 acres, surveyed by authorised surveyors at the cost of the owners, have been examined and passed.

Road Surveys.—Other than those inside blocks prepared for settlement, 119 $\frac{1}{2}$ miles of road have been carefully located, graded, and traversed. There have been 44 $\frac{1}{2}$ miles laid off by staff surveyors at the rate of £9 6s. 9d. per mile; the balance by authorised surveyors at £12 13s. 6d. The greatest length executed by any one surveyor is 56 $\frac{1}{2}$ miles of the new road line from Napier to Wairoa, by Captain Turner, at a cost of £10 14s. 7d. per mile. It has been a work of great difficulty, and the manner in which it has been performed reflects great credit on the surveyor. The remaining 17 miles of the section will be finished in about a month. Messrs. Hallett and Laing have a contract for an engineering survey of the road from Frasertown to Waikaremoana, and from Wairoa to Mahia, a distance of about 50 miles. The field-work of the former is finished; but the mapping not having been done, it cannot appear in this year's returns of completed work.

Other Work.—The sum of £953 1s. 9d., which appears in the return, represents the expense incurred on various works that cannot be brought under the other headings, and, being so considerable, requires explanation. Of it £389 1s. 1d. was the cost of running the east boundary of the Awarua Block, i.e., the boundary between the Land Districts of Wellington and Hawke's Bay, as determined by the Royal Commission. The length of traverse was 28 $\frac{1}{2}$ miles, mostly along the summit of the Ruahine Ranges. On the standard survey of Napier for Land Transfer purposes £150 14s. 4d. was expended, and £132 17s. 8d. on the survey of several small grazing-runs. The principal other items were for surveys and attendance on Supreme Court, inspection and grading of Tologa-Mangatokerau Road, and assistance rendered to Marine Engineer at Gisborne.

Inspection.—Through my having so very lately taken charge, I have been unable to do more in this direction than visit the Gisborne office and vicinity, but I learn that my predecessor, Mr. Williams, inspected the 74 miles of road laid out by Captain Turner, from Napier to Wairoa; the Ormond-Opotiki Road, on which maintenance and contract work has been carried out by the department; road works near Waiapu; and also the settlement surveys at Waikaremoana, Nuhaka North, and Motu. Mr. Goldsmith, the District Surveyor at Poverty Bay, has examined on the ground ten small scattered Native Land Court surveys executed by authorised surveyors, and some

Land Transfer surveys. He reports them to be fairly well done, the chief weakness being indifferent ground-marking and topography. He has also had the supervision of the road works, which has occupied a considerable portion of his time.

The following is a summary of the field-work completed, and also of that now in progress:—

	Completed during the Year.	In hands of Surveyors.
Minor triangulation ...	17,400 acres	12,000 acres
Topographical surveys for selection ...	47,400 "	129,000 "
Rural and suburban ...	23,024 "	11,222 "
Native Land Court (by staff) ...	2,952 "	4,570 "
Native Land Court (by authorised surveyors) ...	25,346 "	48,889 "
Roads ...	119 miles	98 miles

Office-work.—Forty-one Land Transfer deposited maps, with a total area of 19,599 acres, have been examined at Napier, and the Gisborne office has examined thirteen plans, with an area of 5,514 acres. The plans of 27 miles of roads, "taken" and "closed" by local bodies, have been examined and passed. There have been 682 marginal plans placed on certificates of title in lieu of Crown grants, and other certificates, and 369 on leases, licenses, &c. In addition there has been the usual work of checking surveyors' maps, compiling block-sheets and record-maps, and the drawing for lithographing several of the survey districts and sale maps. The area work is very heavy, but I hope to be in a position to devote the time of certain officers specially to it. Beside the large number of block-sheets and record-maps to make, the lack of lithographs of the southern part of the district is severely felt. This it is also the intention to remedy, so far as circumstances will permit.

Work for the ensuing Season.—There is no prospect of any reduction in the number of field surveyors, on account of the great demand for land for settlement. It has already been shown that 140,222 acres are now in progress of survey. This is principally in the Waikaremoana, Nuhaka North, and Motu districts. Applications have also been made to this Land Board to have land thrown open at Pohui, Maharahara, and Umutaoroa, the survey of which must of necessity be taken in hand this season. The survey of roads, of which 98 miles are now in the hands of the surveyors, will be a heavy demand upon us, as further requirements in this direction will be sure to arise to secure roads through Native blocks before the lapse of the right to take them.

THOMAS HUMPHRIES, Chief Surveyor.

WELLINGTON.

As I have only had charge of this district for a short time, and as that only included one month of the year's work under review, I cannot pretend to submit for your consideration anything but a bare summary of the result of the year's work as disclosed by the returns prepared for this purpose.

Minor Triangulation.—Only 11,000 acres have been returned (by Mr. Simpson) of major triangulation, broken down into subsidiary triangles in connection with road surveys in Wairarapa North.

Topographical Survey of Land opened for Selection.—This includes the grading and laying-out of the principal road lines, and the cutting of some of the back lines of sections run along the main spurs so as to allow of practical fencing lines being obtained: 46,800 acres of this work has been mapped and got ready for sale, the average cost being slightly under 6d. per acre.

Sectional Surveys, Rural and Suburban, principally of bush land selected for settlement. This includes the pegging and marking on the ground the boundaries of the various selections. Two hundred and thirty-two sections, containing 61,571 acres, have been done by staff officers at an average cost of 1s. 5d. per acre, and 84 sections, including 52,993 acres, was done by contract by various authorised surveyors in different parts of the district, at a cost of 1s. 1½d. per acre. You will note, however, the average size of the sections surveyed by staff surveyors was only about 266 acres each, and the sections surveyed by contract averaged 630 acres each, and was therefore done at a relatively lesser cost per acre. I would also point out that, as a rule, contract work is more straightforward and less scattered than that done by the staff.

Native Land Court Surveys.—The area surveyed at the expense of the Crown under this heading is much less than in previous years, and was chiefly in connection with lands being purchased by the Government from the Natives. 36,918 acres have been completed in 20 blocks, at a cost of 1½d. per acre; this work was done principally by Mr. O'Donahoo by contract in the Maungakaretu and Tiriraukawa Survey Districts. In addition to this, however, 253,138 acres in 216 subdivisions have been surveyed, at the expense of the Native owners, throughout the entire provincial district, which, of course, requires the same supervision and inspection as the other surveys, the plans being examined, reduced, and recorded by the office staff, and all Native Land Court requirements as to title attended to.

Road and other Surveys.—About 88½ miles of roads have been laid out by the staff surveyors, at a cost of £11 11s. 2d. per mile; this work was done in a great many different districts, which materially increases the cost of the work; this is independent of the roads surveyed under the topographical or sectional surveys. The bulk of this class of work were surveys undertaken under the Governor's warrant in order that the power given in the Native Lands and Crown Grants Acts might be exercised before the right expired, or of roads long in public use but of which the department has no proper record.

Inspection.—Twenty-five inspections have been made by Mr. Ll. Smith, District Surveyor, acting as Inspector for the Chief Surveyor; of these, twelve were inspections of surveys done by staff surveyors, and disclosed as a whole very excellent work; eight were inspections of Govern-

ment surveys let by contracts in various parts of the district; these, with one exception, where the Chief Surveyor, Mr. Marchant, terminated the contract and relet the work, showed that fairly good work is obtained by contract at a moderate cost, and is a great help where a sudden demand arises either to put persons in possession of land purchased on the free-selection system, or to get blocks ready for sale after survey. Five inspections have been made of private surveys sent in under the Land Transfer system; these were undertaken in cases where a doubt had arisen as to the correctness of the work, or where it differed from work already sent in and passed. In cases where the inspections disclosed careless or bad work, the surveyor has been warned that similar work will render it necessary for me to disclose the fact to the Surveyor-General with a view of getting his authorisation cancelled. It may be necessary for me to add that the cost of inspections has been greatly increased from the fact that, prior to Mr. Smith taking up the duties, the work had unavoidably got into arrears, and the surveyors had, in many instances, left the ground. Some of these inspections were exceptionally large, involving several months' work—notably that of the Awarua Native Block, containing over a quarter of a million acres. I am taking steps, however, to prevent a recurrence of this, as all inspections are now well up to date.

Office-work.—During the year 42 road plans, 49 Native plans, 49 sectional plans, 2 trigonometrical plans, 2 township plans, and 10 miscellaneous plans were examined, reduced, and recorded on the various record-maps. Three hundred and two Crown grants were issued, and eight plans of new lands offered for sale were prepared for photo-lithography.

Native Land Court Branch.—Thirty-five plans, to save the expense of survey, were compiled; 454 subdivisions or orders of the Native Land Court were recorded on the standard record-maps of the department, representing an area of 397,865 acres; 807 plans were placed on Native certificate of title forms, and 27 plans placed on deeds for the Land Purchase Department. Of miscellaneous dealings, 120 applications for survey upon leasing were received, 198 nominations for survey were acted upon, 27 lien vouchers passed, and 3,273 notices to the Natives requiring survey sent.

Land Transfer Branch.—There were 104 working-plans examined and passed, 12 standard-sheets of towns constructed, 1,830 plans placed on certificates of title, and the following miscellaneous documents attended to and passed: 78 applications, 658 transfers, 5 proclamations, 4 mortgages, and 31 leases.

General.—New county and 40-chain district maps are urgently wanted, particularly the latter, with a view to some headway being made with publications which are grievously in arrears, but it is impossible to do this with the present staff, who are barely sufficient for ordinary current duties. More office accommodation is also required, the present rooms being overcrowded and in other respects inconvenient. In the clerical branch the letters received and despatched numbered 14,876; vouchers passed, 744; notices despatched, 2,500; applications registered, licenses and leases prepared, 669; warrants, comprising 341 titles and copies, 138; lithographs, posters, Crown Lands Guides despatched, 836; circulars to surveyors, 204.

Proposed Operations for next Season.—I have not yet had time to fully mature plans for the more urgent work which will have to be done during the present year. The boundary pegs of the greater part of the selections made in the blocks opened for selection during the past and previous years have either been put in or surveys for that purpose are now in progress, and I shall have no difficulty in overtaking any arrears there is still to do. A considerable quantity of back-boundary lines have, however, still to be cut and pegged of surveys undertaken in the past where from the urgency of getting the land into the market this has been left undone. The Government is sooner or later forced to do this work, and the cost of doing it is greatly increased by having to send a surveyor on to the ground again; the trig. points have to be reflagged, starting-points re-established, and check-bearings re-observed. I propose, therefore, subject to your approval, to first get the arrears of this work completed, and in new surveys to get such back-lines cut at once as are necessary to put in each corner peg, so that the survey shall be finally completed and done with when the surveyor makes the first survey. A great need, however, also exists for completing the road surveys left undone when the early surveys of this part of the colony were made. Very great injustice will be done to existing settlers, and the future settlement of the country will be greatly interfered with, if these roads are not laid out before the right to take them has lapsed; in many cases it has already done so, and roads are thereby forced into routes which would never have been chosen if the right to take the proper line had been exercised, as they should have been. If this work is not done I predict it will eventually cost the country many thousands of pounds to rectify the omission to do so. Roads which have been in existence as coach-roads for a quarter of a century have never been located on the plans, and a correct plan of the district showing the internal lines of communication cannot be made. I am having rough maps made of each county, showing on them every road laid out when the original survey was made, or that has been legalised since. These I propose sending to the local bodies, asking them to allow their local engineer or overseers to sketch thereon every road that is in use that is not shown, and also to indicate any road that should be taken where the right to do so has not expired; and I trust I can, by simplifying the system of survey adopted, and the unnecessary pegging and calculations which have hitherto been done, to so reduce the work that in two years I shall be able to report that this most necessary work has been completed so far as the present requirements go. I trust, also, in due course to submit for your consideration suggestions in connection with original survey and subdivisional surveys of Native lands, which will in future provide for the taking of the principal roads required at the time the surveys are made.

Whilst, however, providing for the most pressing of the necessary road and other surveys required, I propose to get a very considerable area of Crown lands open for sale, by placing staff or contract surveyors on new blocks of land, first getting the main roads graded and contracts out for forming such portions of them as funds can be provided for, then allowing the surveyor to go on with the sectional work, so that by the time the survey is done the main roads will be ready to be opened, and intending settlers will be able to see the land and the boundaries of their selections, and

the access thereto, before they take up any block. As the surveys have to be eventually done in any case, it is far the cheapest in the long run to get the whole survey done when the surveyor is first on the ground, and though it may for the first year prevent the land being opened as fast as it might otherwise be done, it will, I am convinced, prove more economical and more satisfactory both to the public and to the department. I will, at a later period, report on the steps it will be necessary to take to get the new district and county plans ready for publication.

JOHN H. BAKER, Chief Surveyor.

MARLBOROUGH.

Topographical, Minor Triangulation, and Topographical Survey for Selection under "The Land Act, 1887."—No surveys under these headings have been required during the year, the triangulation covering the northern part of the district—the only part where lands at present are open for disposal—meeting all the requirements appertaining to surveys and applications.

Rural and Suburban Surveys.—Of the 6,704 acres returned at an average cost of 1s. 5·9d., the 6,646 acres surveyed by Mr. Goulter are divided into twenty-five sections, averaging 265 acres, at an average cost of 1s. 5·6d. per acre; twenty-two of these sections, representing 5,962 acres, being in seven different localities in the Pelorus, Mahau, and Kenepuru Sounds. The country is high, steep, and densely wooded to the water's edge. Much time is lost in traversing the beaches of the Sounds. Owing to the abrupt nature of the coast, and the narrowness of the foreshore, it can only be accomplished during short periods before and after low-water. There were 16 miles of bush-cutting, mostly traverses of ridges, and 13 miles of beach traverse in connection with the above. These surveys, as well as most of those done in the sounds during the last few years, fill up the gaps between old surveys revised and located some ten years ago, and in every case the revision work was found correct, and the closures well within the regulation limits. The remaining 684 acres (in three sections) are situated in the Wairau Valley; one, a reserve for pilot- and signal-station at the mouth of the Wairau River, and two on the Erina Run—open country. The balance of the section-surveys done by the schedule surveyors calls for no special remarks beyond stating that, with the exception of three reserves, the whole of the section-surveys returned are for lands applied for on requisition from the Land Board.

Gold-mining Surveys.—Of the 224 acres returned, 24 acres are for a licensed holding and 200 acres for a mineral lease (antimony).

Road Surveys (11½ miles).—These surveys comprise land-plan surveys under Public Works Act, 6 miles, of Kaituna-Tuamarina Road. Three out of the four of the freeholders through whose lands the road passes have conveyed the new line to the Queen in consideration of receiving the old road in exchange; I think, therefore, the local bodies might be asked to take the necessary steps under the Public Works Act to complete these exchanges, the Survey Department undertaking to supply the necessary plans. This line of road follows generally the old line, cutting in and out in many places, these numerous intersections making the survey complex and intricate; and nearly all indications of the original ground-marking of the sections passed over were wanting; requiring a considerable amount of extra survey to re-establish them. The survey of this road was commenced on the 9th June, 1890, and the cost to the 30th June, 1890 (£43 19s.), was included in last year's report.

Track from Kenepuru to Manaroa (1 mile).—This is a continuation of the Manaroa track through freehold sections, and was made with the object of acquiring the road through Messrs. Henderson's property, at Waitaria.

Picton-Port Underwood (2¼ miles).—Portion of track through Mr. McCormick's property, at Wataamonga Bay, Queen Charlotte Sound. Mr. McCormick has agreed to convey this line in exchange for old useless roads, but has not yet executed the conveyance to the Queen.

Track from Portage Bay towards the head of Kenepuru Sound (2½ miles).—This road passes through Mr. Gullery's land, at Torea, and the survey was made to acquire the road which has now been conveyed to the Queen, in consideration of receiving a Crown grant of some Crown land adjoining Mr. Gullery's property. The cost includes the grading of 1½ miles, Mr. FitzGerald having graded 1 mile prior to this survey.

Other Work.—This consists of observations taken at the Ports of Picton and Wairau for determining the variation of the compass, and commencement of Native Land Court survey and subdivision of Kumutoto Native Reserve, Queen Charlotte Sound.

Native Land Court Survey.—Mr. Goulter commenced the survey of Kumutoto Native Reserve on the 1st June, but had to discontinue the work on account of ill-health. About 2 miles of the back ridge are traversed and pegged, and some preliminary stations established on the beach. The cost to date is £40.

Office and Land Transfer Work.—During the year 19 surveyors' plans were received, examined, and recorded, and the greater portion plotted on their respective block-sheets and record-maps. Plans of roads in the Kaituna and Pelorus Valleys were prepared for the Pelorus Road Board, and tracings and litho maps of Native reserves supplied for the sitting of the Native Land Court at Kaikoura. Land plans also of a further extension of the Blenheim-Awatere Railway under the Public Works Act, and for lands taken by the Omaka Road Board, were examined and approved of. The revision of property-tax maps and schedules, and tracings of new subdivisions for the approaching triennial assessment, are now in hand. Throughout the year a considerable amount of work was done for the Crown Lands Office, which cannot be shown in tabular form. Some of the old application maps having become very much worn, others have been prepared, and all the application and exhibition maps kept up to date. In the Land Transfer branch 8 plans, comprising 12 original sections, representing 266 acres in 43 allotments, were received and passed; 34 certificates of title, representing 68 marginal plans, were prepared; and 3 applications, 2 leases, 65 mortgages, and 92 transfers examined.

Proposed Operations for the Coming Season.—To commence with we have in hand section survey (4,200 acres) in different parts of the Pelorus Sound, 1,000 acres in Queen Charlotte Sound, survey and subdivision of Native reserves at Kumutoto, Ruakaka, and Tahuahua (4,500 acres), in Queen Charlotte Sound, and survey of Native Reserve A (4,800 acres), extending along the coast some 12 miles in length between the Porangarau Stream and the Hapuka River. Of road surveys we have in hand land-plan survey of trespass road through sections Nos. 1, 2, 3, and 46, at Mahakipawa, the freehold property of Mr. Cullen.

In addition to the above we may be called upon to grade a track from Nydia Bay to Havelock—20 miles—a petition from the settlers on the west side of the Pelorus Sound for a track to be made from thirds and fourths derived from deferred-payment, perpetual-lease, and small grazing-run lands on that side of the sound having been received and approved of by the Land Board. These, with the ordinary requisitions for surveys from the Land Board, constitute the principal part of the work for the coming season.

I propose, if the time will admit, that Mr. Goulter, when surveying the Native Reserve A on the East Coast, should make a topographical sketch-map of the country lying behind the reserve at the foot of the Seaward Kaikouras, to embrace the Waipapa and Kincaid Runs, in anticipation of the expiry of these leases in 1896. The topography of this part of the district is very meagre indeed.

The amalgamation of the Survey Department with the Crown Lands, effected at the beginning of May, and the appointment of Mr. Robinson as Receiver of Land Revenue, have thrown a large amount of work on the Survey branch hitherto performed by Mr. White, the late Crown Lands Clerk, and if my staff is further reduced, I am afraid the work of the office will get into arrears.

HENRY G. CLARK, Chief Surveyor.

NELSON.

Minor Triangulation with Topography.—There have been 157,813 acres, at a cost of 1½d. per acre, completed by Messrs. Smith and Thompson in the Amuri circuit for the purpose of controlling revision of old work and present leases. During the past season, which has been exceptionally fine, the field-work has been nearly completed of 21,351 acres, including two blocks selected by the Midland Railway Company, 42,444 acres of revision-survey, and 80,000 acres of triangulation. The so-called revision-surveys are in reality, original, as sections were not laid off on the ground, the old work being only magnetic traverses without check, and the sections marked off and scaled on the office plans. Mr. Murray has completed the trig. survey and topography of the bays and mountainous block of country lying between the Takaka Valley and Blind Bay, and completed the outlying applications in arrear. A close was made between the Collingwood and Nelson triangulation, with a difference of 8" in observed convergence, and 1·9 links per mile on side CC-BR, and 2·1 links per mile on side CC-A.

Rural and Suburban Sections.—There have been 25,663 acres surveyed, containing 314 sections, at an average cost of 2s. 2d. per acre; and 983 acres of surveyed and 54,750 acres of unsurveyed second-class lands have been thrown open for selection. About one hundred and eighty applications for land within the Midland Railway Company's area for selection have been received from the company, the surveys of which will have to be undertaken when a basis of settlement has been arrived at. These have brought considerable work on the district office in supplying information and reports to the Commissioner of Crown Lands.

Gold-mining Surveys.—Forty-eight surveys of licensed holdings and sites have been made, including one mineral lease. Applications for mining surveys fell off considerably during the year, but have come in lately, and there are nine at Westport and eighteen at Reefton to be surveyed. Mr. Bullard completed the arrears of surveys in the Karamea district, which had accumulated for several years, on account of the difficulty of access and expense of sending a surveyor there. He is now transferred to the North Island.

Town Sections.—Mr. Snodgrass laid off the Village of Coalbrookdale, consisting of 111 sections at a cost of £1 3s. 6d. per acre. This township is located at an elevation of 2,000ft. above sea-level, in rough country. A survey has also been made of the coal staiths, breakwater, beach, &c., for the issue of a new plan of the Town of Westport. A standard survey of Westport has been required for some years past, but it has been impossible to undertake it and keep up current work; the same may be said of the closing triangles to connect the Karamea and Buller circuits.

Road Surveys.—Thirty-five miles and a quarter of road survey have been made at an average cost of £6 3s. 5d., consisting chiefly of roads in use not previously surveyed, and required to give access to alienated lands. This includes five and a half miles of Riwaka Valley Road to give access to bush-land on the back hills.

Other Work.—This includes the cost of a large amount of work in progress, but not returnable this year; other surveys than for settlement purposes, reports, attendance at Courts, and other miscellaneous items.

Land Transfer.—There have been 133 certificates of title with 400 plans issued, and 294 plans placed on certificates for transfer, 180 plans have been examined and checked, besides plotting and recording the work done, and 141 certificates of title are in arrear. Mr. Wright, from the Survey Office, has been employed in checking and making transfer surveys, reserves, &c., in Nelson and suburbs connected with this branch.

Office-work.—One hundred and sixty-one leases and licenses with 354 plans have been issued, three Crown-grant record-maps have been compiled, and about fifteen more are urgently required, and fifteen selection-maps require renewal, four new application-maps have been made, and seven prepared for printing. I would point out that thirteen years ago sheets of the districts in Nelson were compiled from the old magnetic surveys and lithographed. These are now still on sale

to the public who require information about land. Owing to the progress of the new surveys, these are behind in information and often misleading, and about forty principal districts should be republished, but cannot be prepared owing to other work. There have been 157 field-plots and 416 sheets of tabulations received, also 1,633 letters and 656 vouchers passed through; 147 surveyors' plans, with 338 sheets of calculations and fifty-seven sheets of railway and road plans, with the necessary check calculations, have been examined and recorded on the block-sheets. Fourteen new block- and trig.-sheets have been prepared. A chart of the French Pass and surrounding bays has been compiled for the information of the Admiralty, and a set of observations taken to ascertain magnetic variation, and a survey for the Marine Department, showing the new position of buoys outside Nelson Harbour. A large plan, showing the topography of the North Amuri and Upper Waiau country, has been made for the Rabbit Department for fencing information, and copies of selection-maps for district offices, besides tracings of old surveys furnished to surveyors and others required by the Lands Department. The property-tax plans and schedules are now in progress, being posted up for the last triennial period, on which all the available staff are employed and current work postponed. One staff and one temporary draughtsman have been discharged during the year.

Proposed Work, 1891-92.—The arrears in hand are forty-four sections of 6,816 acres, being applications principally in the Waimea, Takaka, and Collingwood districts, isolated and scattered over long distances; and twenty-seven mining surveys in the Reefton and Westport districts; besides which the survey of current applications for settlement coming in during the year. A block of suburban land, near the Mohikinui Coal-mines, is required to be laid off in about five-acre blocks for the settlement of the miners there, which will be undertaken by Mr. Snodgrass, who has in hand also nine mining surveys. Mr. Montgomerie, at Reefton, has eighteen mining surveys in hand, and when the applications for land in the Midland Railway area can be dealt with, amounting at present to about 180, he will not be able to complete them without assistance. Messrs. Sadd, Greenfield, and Thompson will undertake the work in the Waimea, Takaka, and Collingwood districts, and the last-named will be available for assistance to the other surveyors, who have more work than they can get through in a reasonable time. Mr. F. Smith will complete the work in progress in the Amuri circuit, and has several revision surveys of large blocks before certificates of title can be issued.

JOHN S. BROWNING, Chief Surveyor.

WESTLAND.

Topographical Survey for Selection under "The Land Act, 1887."—The total area—87,480 acres—under this heading, cost 1'6d. per acre, is topography derived from extensions of traverses and exploration surveys during the execution of isolated section and other surveys, and is for better definition of areas for application under the Act quoted, &c.

Rural and Suburban Section Survey.—Eighty-six sections, of a total area of 4,773 acres, cost 2s. 0½d. per acre. These are principally "free selections before survey," of small areas with a few reserves for public purposes, Midland Railway lands selected, and some of the old "built" sections revised and brought under standard. The work is very scattered, the extreme sections being over eighty miles apart in a straight line, situated in some nineteen or twenty survey districts, and in heavily-bushed country, in expensive districts, and entailing considerable bush cutting. The cost of this class of work during the year would have been lighter but for detentions caused by the excessive wet weather and flooded condition of the country when the works were in progress. Wet weather on the west coast of the South Island is a very important factor in out-door work.

Town Section Survey.—One section of one acre only. The comparatively high cost of this survey is owing to its being an isolated survey.

Native Land Survey.—Two thousand three hundred acres, comprising eighty-three subdivisions; total cost, £98 10s. This was a resurvey of the Native reserve in the Lower Arahura Valley and a readjustment of subdivisions, the work being done by Mr. J. N. Smyth, for the Native Trust Department. This was a greatly-needed piece of work to adjust the holdings of lessees; the former subdivisions being very old "piecemeal" surveys, executed at various times, some sixteen to twenty-two years ago, and on magnetic meridian. The greater part of the work was over cleared or cultivated land.

Gold-mining Surveys.—These comprise a total area of 495 acres 2 roods 19 perches in twelve divisions. These surveys comprised special claims and licensed holdings, and were still, as of late years, principally taken up with the intention of working the auriferous deposits by means of dredging operations. There is a considerable falling-off this year in the areas taken up for gold-mining operations on a large scale, due probably to the unfortunately unsuccessful attempts to initiate the gold-dredging industry north and south of Okarito; but it is to be hoped that the experience gained will be profited by in the new ventures in that direction now extant.

Road Surveys.—The mileage noted comprises chiefly trial line for road from Paroa to Teremakau, the balance being mileage completed in work on hand by Mr. Murray, between Cook's and the Mahitahi Rivers during the latter part of last year, and includes his and party's expenses in returning overland to headquarters, and preparation of plans, specifications, &c. There is also included the cost of survey and plans of two pieces of freehold land purchased from owner and used for a deviation of the Christchurch Road at the Rangiriri.

Other Work.—This consisted of survey labour in finding difference between true and magnetic meridian; sundry repairs to survey buildings, fences and stable effected by survey labourers at Ross and Hokitika during bad weather, and general office assistance afforded by field staff, necessitated more particularly during the late departmental changes, and also embracing plotting block-maps, checks and revisions of calculations, and tabulations of old traverse surveys, &c.

Office-work.—The miscellaneous return sent herewith sets out the number of plans placed on certificates of title, ordinary and in lieu of Crown grants; Native titles, leases, and licenses, &c.;

plans passed for Land Transfer; Native Lands, Crown Lands and Goldfields Departments; and the Greymouth Harbour endowment; it also embodies statement of other plans prepared, general plans of pastoral areas and Crown-grant record plans. The total number is 527, cost £122 1s. 6d., which cost is reduced by the fees received accruing to the department for preparation of the sundry leases, licenses, &c.—viz., £118 12s. 6d., to £3 9s. So that class of work was practically reproductive. Considerable deficit yet remains in sundry of the departmental and general plans required, such as the Crown-grant records, territorial, &c., maps; and it is much to be regretted that the late removals of the draughtsmen, Messrs. Pfeiffer and Covil, will still more retard their preparation. It is deemed advisable to call attention here to the extraordinary number of returns required to be prepared during the year, and necessitating an excessive amount of clerical work; also the charges of the various roads for maintenance and construction entails a very large amount of clerical and accountant's work. I append a statement of the ordinary routine returns involved under regulations and instructions existent; the total number given is actually doubled in fact, because it is imperative that office copies or duplicates must be kept or filed for reference when or if any particulars are again required. Beyond these (during the parliamentary sessions particularly) other returns are frequently demanded or necessitated.

JOHN STRAUCHON, Chief Surveyor.

CANTERBURY.

Minor Triangulation and Topographical Surveys.—Mr. T. N. Brodrick continued his operations in the south-western part of the Canterbury Land District, and completed the trigonometrical and topographical survey of the Ahuriri and adjacent country, embracing about 145,000 acres; he also effected the topographical survey of the mountainous regions, which include the Great Southern Alps from near Mount Sefton, northward beyond Mont de la Bèche, eastward to the Liebig Range, and south to Mount Jukes, embracing Mount Cook itself, and the Great Tasman and Murchison Glaciers, the area being 151,000 acres. Mr. Brodrick's reports and plans are of such general and scientific interest that I forward them for your consideration, and, with your approval, for publication. The operations of the party were attended by considerable hardship and risk. As Mr. Brodrick has not yet forwarded particulars of his triangulation, I am not in a position to furnish you with comparisons with prior triangulations.

Rural and Suburban Surveys.—Mr. Welch's surveys comprised the Midland Railway Company's Blocks XLVI. and XLV. He completed the field and office work of an area of 28,929 acres, in ten large divisions, which cannot be classed as wholly sectional survey. It appears that the survey was impeded by reason of the altitude of the country and unfavourable weather; nevertheless a considerable amount of work was completed. Mr. Welch also partly surveyed Blocks L. and LIV., and defined two small sections. Mr. Brodrick surveyed 2,405 acres, being land applications in the Tasman and Pareora districts. Mr. McClure's out-turn of work under this head comprised about 15,500 acres, the bulk of it being on the Motunau and Greta Peaks Runs, the remainder scattered over North Canterbury. Mr. Mathias's 15,754 acres comprised surveys of applications in various parts of the Geraldine and Ashburton Counties, but principally at the Waitohi Hills.

Road Surveys.—The only surveys of this class are Mr. Brodrick's deviation road between Longslip Creek and Benmore Station, Otago; Mr. McClure's road through the Midland Railway Company's Block XLI., in the Rangiora district; and Mr. Mathias's Ashburton Gorge Road.

Other Work.—Under this head the only operations worth mentioning are the following: Determination of the magnetic declination at Timaru and Port Lyttelton, survey and observations at the Tasman and Mueller Glaciers, and the survey of plantations.

As I only took charge of the Canterbury Land and Survey Offices on the 10th June, 1891, my superintendence was practically confined to the Wellington Land District surveys and offices; consequently the foregoing report had to be compiled from a perusal of the records and data furnished by the Chief Draughtsman, Mr. Shanks, to whom I am also indebted for the following report:—

Office-work.—The office work during the past year has been varied and unsatisfactory, so far as overtaking arrears is concerned; the principal draughting work done has been the preparation of seven lithographic tracings: No. 22, Blocks VI., VII., VIII., Lake Ellesmere Reserve, not published; No. 24, conservation reserves, Rangitata Island, published; No. 25, Cannington Village Settlement, published; No. 26, village settlement, Lake Ellesmere, not published; No. 27, pastoral runs, west of Lake Ohau, published; No. 28, land for selection, Stonyhurst district, published; No. 29, Subdivision 36,297, near Mayfield, not published. Two of the foregoing, and also one prepared the previous year of Block V., Lake Ellesmere Reserve, are not yet published, the tracings being still in the office awaiting decision as to dealing with the land. The requisite plans were placed on 128 certificates of title, 111 run licenses (in duplicate), 108 perpetual leases and village-settlement leases (in triplicate), thirty-one Native Land Court titles, and nine pastoral-run leases (in duplicate), representing 754 diagrams in all, some of which, especially on the run licenses, were intricate. Selection maps of the Noble, Esk, and Katrine Survey Districts were prepared, with the new run boundaries marked thereon, and those districts previously done had the old run boundaries expunged and the new ones shown instead. The Four Peaks, Pareora, Patiti, Ophi, and Acland districts were charted up to date, and the Waimate County map and the Geraldine and Ashburton County maps partially done. Lithographic tracings were prepared of the Godley Glacier and Huxley Saddle for illustrating the annual report. A number of block-sheets were checked and revised, giving late surveys and other information. Tracings and descriptions of the several Midland Railway blocks were prepared; also tracings of Native subdivision surveys for the Native Land Court, and lithographic tracings of the Tasman, Murchison, and Mueller Glaciers for illustrating Mr. Mannering's work on the New Zealand Alpine Country. The Christchurch and Leeston districts were checked

and brought up to date; the former was traced, and the original of the latter forwarded to Wellington for publication. The surveyors' plans received during the year were checked, the necessary working tracings for the surveyors were prepared, and a multitude of miscellaneous duties were attended to.

Land Transfer Branch.—Mr. D. H. Monro has furnished me with a report and schedules showing in detail the duties attended to by him and his two assistants. The work executed approximated to that in each of the four previous years. New subdivision plans were prepared of rural sections in the Heathcote Valley and at Washdyke. The total number of plans passed was 183, of which 32, comprising 246 lots, and an area of 6,564 acres, were deposited plans, and 18 were road-deviation plans. Plans were placed (in duplicate) on 912 certificates of title and on 128 certificates in lieu of grants. Areas were checked for 357 transfers, 9 mortgages, 43 leases, 219 applications, in addition to the necessary attention to the various other duties of the office. The total cost (£570) appears moderate for the amount and importance of the work done.

Proposed Operations, 1891-92.—It is proposed to continue the surveys of the Midland Railway blocks, and to push on with the surveys of the applications for land, which are seriously in arrear; to survey for sale any undisposed of portions of Crown land, and, should time permit, to triangulate the Hunter Valley. The office staff will complete the property-tax maps, take up the examination, reduction, and recording of plans of about 50,000 acres, which were surveyed last season; and, if found feasible, with the time at our command, it is recommended that the publication of the district maps be proceeded with.

J. W. A. MARCHANT, Chief Surveyor.

OTAGO.

Topographical Survey.—Under this head I have included the subdivision of Runs 218 and 218A (comprising about 23,000 acres, lying chiefly in the Nenthorn district) into five small grazing-runs. This survey is quite sufficient for the purpose required, and the cost is somewhat under $\frac{1}{2}$ d. per acre.

Minor Triangulation.—There are only 5,916 acres under this head, being a few triangles in the neighbourhood of Green Island, done at a cost of $\frac{1}{2}$ d. per acre.

Minor Triangulation with Topography.—This comprises 20,000 acres in the Dart Valley, and was undertaken by Mr. Wilmot in order to connect outlying surveys, the cost of which is under 2d. per acre.

Topographical Survey for Selection under "Land Act, 1887."—There were 10,750 acres prepared for selection in Blocks VII., X., and XI., Woodland district, by Mr. D. M. Calder. The country is densely timbered and very broken, but Mr. Calder succeeded in getting very passable grades over the whole of it. The cost of this preliminary survey is $7\frac{1}{2}$ d. per acre.

Rural Section Survey.—There are 55,063 acres returned, which may be divided into two very different classes; about 32,000 acres were open country, chiefly on Runs 205A., F., and G., 222, 222B., and 223E., these were cut up into about 100 large-sized sections, at a cost of only $6\frac{1}{2}$ d. per acre. The remainder is chiefly comprised in 22,000 acres of bush country, requiring careful exploration for roads, &c., and has cost on an average somewhat over 2s. 5d. per acre. The average of the whole 55,063 acres is a little over 1s. 4d. per acre.

Native Land Court Surveys.—These surveys comprise some Native reserves near Purakanui, Longbeach, and Seacliff, which were subdivided by Mr. H. Maitland. The cost per acre is very high, but the sections were small, only averaging 20 acres each, and were chiefly in rough bush country. Cost per acre, 8s. $5\frac{1}{2}$ d.

Goldmining Surveys.—As compared with last season only about one-third of the area has been surveyed this season, viz., 3,471 acres, at a little under 5s. per acre, which is about the usual rate. Of this, about 2,200 acres were surveyed by the staff, and 1,270 acres by authorised surveyors on the fee system.

Roads, Railways, and Water-races.—The chief item is 11 miles of the Waikawa-Catlin's Road, executed by Mr. Strauchon, at a cost of £14 2s. per mile. This road has been carefully graded, mostly through dense bush, and in a country difficult of access. Everything had to be carried on men's backs—in some cases for 15 miles. The work has been done in a very creditable manner.

Other Work.—There is nothing unusual calling for comment under this head, excepting the work done by some of the settlement surveyors in carrying true bearing into the bush blocks they are subdividing. This is owing to the want of triangulation or standard traverse, but I hope to get this overtaken during the coming season.

Survey Inspections.—I have made fifteen field inspections during the year, besides accompanying yourself from Catlin's to Waikawa, and also from Oamaru to Lake Pukaki; I also, as Land Classification Commissioner, with Messrs. Maitland and Clark, spent nearly three weeks in November and December last inspecting and classifying runs in the Otago Survey District.

Dunedin Office.—During the past year 109 Crown grants and certificates of title, 63 run licenses, 92 perpetual leases, 30 deferred-payment licenses, 5 mineral leases, 4 agricultural leases, 17 prospecting licenses, 60 grants for special claims, 28 license-holding certificates, and 40 miscellaneous leases were prepared and recorded, besides other routine office work. The following plans were checked: From staff 143, Land Transfer 54, road and railway in duplicate 43, and mining leases 51. Twenty-five plans were reduced and prepared for printing here, of which 5,475 lithographs were pulled; also 257 plans were mounted for this and other departments. Letters, &c., received and sent during the year amounted to 3,200.

Land Transfer Work.—There were 32 applications, 980 transfers, 566 mortgages, 154 transmissions, 171 leases, and 35 caveats examined and checked.

Proposed Operations for 1891-92.—The triangulation of the Tautuku Bush, comprising Rimu, Tautuku, and Woodland districts, with parts of Mokoreta, Waikawa, and Catlin's districts, was not carried on last season by Mr. Strauchon as proposed, as he could not be spared from some

settlement-surveys in Waikawa district, which were urgently required; after which he completed the locating and grading of 19 miles of the Waikawa-Catlin's Road, according to instructions. The consequence is that the settlement surveys in these districts are ahead of the triangulation, which causes delay and inconvenience, as the surveyors have to carry on the true bearing under great difficulties. I have therefore arranged that Mr. Wilmot, of Queenstown, shall leave his district for a few months, and first of all carry in standard bearing from the geodesical station on Forest Range, in the Mokoreta district, to "Black Horn" in Waikawa district, and thence to the heart of the Tautuku district, which will afford the means of checking the bearings in the Taukupu Valley. As the triangulation of bush country is a slow process, I do not expect he will be able to do more than finish the triangulation of the Waikawa district, and perhaps throw a few triangles into Tautuku district before he returns to his own district.

As Mr. Langmuir, District Surveyor for Lawrence, has lately completed the settlement surveys in Tuapeka West and Rankleburn districts, and has only a few spotting surveys to overtake, I believe that he also will be able to spare a few months from his district; and I propose that he shall carry in standard bearing from geodesical Station 1 in Glenomaru district to A in Catlin's district, thence to Wisp Hill and Mount Tautuku (the latter in Rimu district). From this point he could in two sights join on to one of Mr. Wilmot's stations, thus completing the circuit and closing the work. If time permits he could measure a base-line in the vicinity of Tautuku or Taukupu Bays, and extend a few triangles northwards. As Mr. Langmuir has made a speciality of base-line measurements with the steel tape suspended above the ground, and has incurred considerable personal expense in perfecting apparatus for the rapid and accurate measurement of distances with the five- and ten-chain tapes, he is eminently fitted for this work, and I have no doubt will carry it out in a satisfactory manner.

On the topographical map of the Tautuku district, which is attached hereto, I have shown the scheme of triangulation which I propose to extend over the six districts previously mentioned. You will observe that the sides are longer than in ordinary minor triangulation, as they average five or six miles, but I have gone over the whole map carefully with Mr. Strauchon, who has an intimate knowledge of the country, and I think it is the best scheme that can be devised. If required, these triangles can be broken down into smaller ones, but now that the use of the five-chain tape has very greatly increased the accuracy of chained traverses, it has, to a large extent, done away with the necessity which formerly existed of having the reference points closer together.

As the land in the Tautuku Bush is being taken up as fast as it is surveyed, Messrs. Calder and McCurdie will not be able to keep pace with the demand; I therefore propose that Messrs. Edie, Falkiner, and Maitland should be employed in subdividing land for settlement in the Woodland and Tautuku districts until the supply is a little ahead of the demand.

I anticipate from this time forward that survey operations on the goldfields will gradually decline, which will enable the goldfields surveyors to devote more time to settlement-surveys. I was in great hopes that the extension of the standard survey over the City of Dunedin would have been undertaken last summer, as the want of referring-marks over a large portion of the city adds considerably to the cost of the Land Transfer surveys; but on applying to the City Corporation they declined to take any steps in the matter, so nothing was done.

C. W. ADAMS, Chief Surveyor.

SOUTHLAND.

Topographical Survey.—A rough survey, embracing about 82,000 acres of the central portion of Stewart Island, was made by Mr. John Hay for the purpose of ascertaining whether there was any country fit for pastoral pursuits and generally to acquire some knowledge of this hitherto unexplored locality. It was found to be densely wooded, very broken, and at present too inaccessible for ordinary purposes.

Topographical and Trigonometrical Survey.—The same officer completed 72,700 acres of the southern portion of Stewart Island, between Port Pegasus and Port Adventure. This survey, which was commenced for the purpose of controlling the large number of tin-mining claims applied for some two years ago, was carried out under considerable difficulties owing to the rough and densely-wooded nature of the country.

Rural and Suburban.—The work returned under this heading was chiefly for settlement purposes, but includes eighteen saw-mill areas, aggregating 1,892 acres, the cost of which (£186 2s. 6d.) was paid for by the applicants in terms of the regulations. Excluding these saw-mill areas, the area surveyed was 10,343 acres.

Native Land Court Surveys.—Mr. Blaikie surveyed 1,700 acres into eight subdivisions.

Gold-mining Surveys.—Eight applications, totalling 88 acres, were dealt with; three of these, being situated at Coal Island, Preservation Inlet, were somewhat expensive to survey, but the applicants in all cases pay the fees.

Road Surveys.—Mr. J. Strauchon surveyed 11½ miles of the Waikawa-Catlin's Road at the rate of £14 per mile, which, considering the nature of the country and the exceptionally wet season, was very creditable to him. Mr. Hay laid out 16½ miles of the Orepuki-Waiau line at a cost of £16 per mile; this also in forest country, and somewhat difficult to get at. Mr. Blaikie, who was temporarily employed on the staff, surveyed 11 miles of road in Waikawa district to provide access to the surrounding Crown lands which are proposed to be opened for settlement shortly. The cost was £26 16s. 3d. per mile, which is very high, but the surveyor represents that the country is exceedingly difficult to road, and that he was much hindered by wet weather. Mr. Sharp executed 9¾ miles in the same locality, and for the same purpose, connecting his work with Mr. Blaikie's. This was done at a fixed rate of £15 per mile. Mr. Miller made an engineering survey of 5 miles of Mr. Hay's Orepuki-Waiau Road for the purpose of getting out plans and specifications for inviting

tenders, and it was understood that the cost (£10 4s. per mile) was to include supervision of the construction works.

Other Work.—Under this heading Mr Strauchon returns £39 for office work in connection with preparing plans and specifications for sections of Waikawa-Catlin's Road, and for selecting and clearing trig. stations, cutting tracks, &c., preliminary to triangulating the Taukutu Bush.

Office-work.—Thirty-one plans, containing 97 lots, aggregating 2,803 acres, were examined. Diagrams have been placed on 458 duplicate certificates; on triplicate certificates in lieu of Crown grants, 339 copies; on perpetual, gold-mining, coal-mining, and other leases and licenses, 204 diagrams; 77 leases and 67 applications were also examined.

Lithographs, &c.—Five lithographic plans were prepared, and 1,500 copies were printed locally. Eighty-seven lithographs and 38 maps have been mounted.

Work done for other Departments.—The principal item under this heading is the revision of plans and schedules for the triennial assessment of the Property-tax Department, but this work will not be completed before the end of July. Three maps have been specially prepared for the Rabbit Department; and a few plans of roads have been examined for local bodies.

Future Operations.—Having so recently taken charge of this district, I have not yet had the opportunity of acquiring personal knowledge of the Crown lands available for settlement, but it is proposed that Mr. Wilmot should carry on the triangulation of Tautuku Bush, commenced by Mr. Strachon, preliminary to preparing for settlement some 30,000 acres in the neighbourhood of Waikawa; and the roads laid off by Messrs. Blaikie and Sharp, above referred to, may be regarded as a first instalment towards opening this land. Mr. Hay will continue settlement-surveys in Longwood district, where some 4,600 acres are in hand. In addition to these, arrangements have been made for resuming a considerable area of saw-mill licenses, from which the timber has been cleared, and for which inquiries continue to be made for settlement purposes. There are also some village lots to be surveyed, besides isolated sections, which are granted from time to time by the Land Board, subject to survey fees being paid. Steps are being taken for initiating a system of record for correspondence, and it will take some time to get this into proper working order, but my experience in other offices has convinced me that such a system means economy of time when once in working order. It affords me great pleasure to testify to the hearty support I have received from all officers here since my arrival.

G. W. WILLIAMS, Chief Surveyor.

APPENDIX No. 2.

DETAILED REPORT ON ROAD WORKS UNDERTAKEN BY THE SURVEY DEPARTMENT.

AUCKLAND.

1. *Fern Flat*.—This road opens up about 3,000 acres of Crown land, and the work completed consists of 42 chains of widening into a cart road from 8ft. to 12ft., and 1 mile 55 chains of road improved and repaired. The road to be of much use requires further widening. Mr. Menzies is in charge.

2. *Okaihau-Victoria Valley*.—Main road opening up about 7,000 acres of Crown land, and giving through communication from Waimate to Victoria Valley, Mangonui. The principal work has been from the northern end, and consists altogether from both ends of 17 chains of new bridle-road formed, 2 miles 20 chains of bridle-road improved, and 6 miles of bridle-road maintained, and 180 chains of forest clearing. Mr. Menzies in charge.

3. *Ahipara-Herekino*.—Main road opens up about 6,000 acres of Crown land. Very little work has been done during the past year beyond keeping the road open for traffic, and re-forming some 14 chains of road 14ft. wide, and other necessary repairs. Mr. Menzies in charge.

4. *Herekino-Village Settlement*.—Nothing has been done during the past year in this settlement, any contracts let to the settlers being upon the Herekino-Whangape Road.

5. *Herekino-Whangape*.—Opens up about 7,000 acres of Crown lands, and forms portion of the through road to Hokianga. Some 2 miles 20 chains of bridle-track have been formed and plans prepared for necessary bridges over the Awaroa and Rotokakahi Inlets of the Whangape Harbour. Mr. Menzies in charge.

6. *Herd's Point-Takahue*.—Opens up about 20,000 acres of Crown land. Not much work has been done upon this road during the past year beyond 31 chains of widening from 6ft. to 14ft., 1 mile of bridle-road improved, and 6 miles of bridle-road maintained.

7. *Motukaraka Village Settlement*.—Opens up 3,000 acres of Crown land. The only work done during the past year has been 50 chains engineering-survey, 15 chains bridle-road formed, and 5 miles 32 chains bridle-road improved. Mr. Menzies in charge.

8. *Waimamaku-Pakanae*.—Opens up about 5,000 acres of Crown land. The work done during the past year consists of 2 miles 38 chains of dray-road constructed 14ft. wide. Mr. Menzies in charge.

9. *Waimamaku Village Settlement*.—Road opens up about 4,000 acres of Crown land. The work done during the past year has been 49 chains dray-road formed from 6ft. to 14ft. and 16ft. wide, and 4 miles bridle-road maintained. Mr. Menzies in charge.

10. *Punakitere Village Settlement*.—Three miles of bridle-road maintained. No other work done.

11. *Opanake to Hokianga, or Kaihu to Punakitere*.—Opens up 100,000 acres or more of Crown land, and will give through access from Dargaville to Hokianga. The work done during the past year has been 1 mile 21 chains of dray-road formed, 6 miles 40 chains of bridle-road formed, and 5 miles of dray-road maintained. The through road stands as for progress at both ends as follows: At the north or Hokianga end, 6 miles 21 chains of dray-road are formed, and there has been graded, cleared, and permanently located also another mile. At the Opanake end, 6 miles 40 chains of bridle-road formed, and some two miles additional graded and pegged. Mr. Menzies in charge.

12. *Wairau-Helena Bay*.—Opens up 2,000 acres of Crown land. Nothing has been done during the past year. The road is in bad order owing to slips.

13. *Opuawhanga-Whananaki*.—Opens up 2,000 acres of Crown land. Survey in progress through Wairahi Block. Compensation with Native owners arranged.

14. *Whananaki Village Settlement Roads*.—The only work done has been improving about 1 mile 20 chains of bridle-road. Mr. D. C. Wilson, Inspector.

15. *Kawakawa-Whangarei Main Road*.—The work done has been 2 miles of dray-road constructed and 104 chains of ditching and embankment completed. Mr. D. C. Wilson, Inspector.

16. *Hukerenui Village Settlement*.—Opens up 3,000 acres of Crown land. The only work done has been some 60 chains of dray-road formed.

17. *Wairau Bridge and Road beyond*.—Opens up about 10,000 acres of Crown land. One mile 30 chains of bridle-road formed during the past year to give access to sections selected in Blocks XIII. and XIV., Hukerenui, on western side of bridge.

18. *Whangarei through Taheke*.—Opens up 1,500 acres of Crown lands, and the only work done is 4 chains of dray-road and construction of one 30ft.-bridge.

19. *Parua Bay Village Settlement*.—No work done during the past year on this section.

20. *Paparoa-Waikiekie*.—Opens up about 3,000 acres of Crown land. No work done, as the title has not yet been secured and certain landowners have obstructed continuation of works.

21. *Opuā to Waimate*.—Opens up 4,000 acres of Crown land. The work done has been 12 miles 40 chains of engineering-survey and plans prepared, together with those for three long bridges. The titles are yet to be secured before contracts are let. This is a very important road, and its opening is very anxiously looked for by the settlers of Whangai and adjacent lands, so as to give them access to Opuā Wharf.

22. *Matakana-Te Arai*.—Opens up 5,000 acres of Crown land. Nothing has been done during the past year, though the road requires further expenditure down Whangaripo Valley.

23. *Omaha Village Settlement Roads*.—Nothing has been done during the past year. Some bad slips require removing.

24. *Helensville-West Coast*.—Five miles of dray- and bridle-road formed and improved. Mr. H. M. Wilson in charge.

24A. *Woodhill Bridge*.—Opens up 2,000 acres Museum endowment. One cart-bridge 68ft. long constructed, and $4\frac{1}{2}$ chains of dray-road completed.

25. *Waikomiti-West Coast*.—About 5 miles of dray-road improved and constructed. Mr. H. M. Wilson in charge.

26. *Hunua Road*.—Opens up about 5,000 acres of Crown land, grant to Board Road, in aid of improving five miles of main road.

27. *Akaaka Swamp*.—Improves 3,000 acres of Crown land. One mile $2\frac{1}{2}$ chains new drain completed 7ft. deep; 2 miles of old drain and stream cleared and widened.

28. *Whaerenga to Whangamarino*.—Opens up 3,000 acres of Crown land. Four miles of bridle-road kept open.

29. *Te Aroha Drains*.—Nothing done during the past year.

30. *Waingaroto-Akatea (Firewood Creek)*.—Opens up 10,000 acres of Crown land. Work done during the past year has been building a bridge over Firewood Creek $51\frac{1}{2}$ ft. long, and constructing 4 miles of bridle-road. Mr. W. P. Cogswell, Inspector.

31 and 32. *Whaingaroa to Mangapiko*.—Opens up about 10,000 acres of Crown land. About 3 miles 40 chains bridle-road constructed. Mr. W. P. Cogswell, Inspector.

33. *Whaingaroa-Waitetuna*.—Opens up about 3,000 acres of Crown land. Two miles of dray-road improved during the past year. Mr. W. P. Cogswell, Inspector.

34. *Kawhia to Waipa and Raglan*.—The only work done under Mr. Cowell's direction has been the removal of slips and keeping the road open for horse-traffic.

35 to 44. *Rotorua and Taupo Districts*.—Under Mr Blythe's charge, who now reports direct to the Surveyor-General.

45. *Stratford-Mangaroa Road*.—During the past year Mr. A. B. Wright has explored and made an engineering survey of 30 miles of this road and prepared plans and specifications for four contracts. Some 4 miles of bridle-road at the Ongaruhe end has been let by contract, and is in course of completion.

GERHARD MUELLER, Chief Surveyor.

STATEMENT showing PAYMENTS to LOCAL BODIES in the AUCKLAND LAND DISTRICT during the Twelve Months ended 30th June, 1891, from "Thirds" of Deferred-payment and Perpetual-lease Lands, and "Fourths" of Small Grazing-runs.

Local Bodies.	Deferred-payment and Perpetual-lease Lands.	Small Grazing-runs.	Total Payments.	Length, Locality, Description and Particulars of Work authorised by Waste Lands Board.								Cost of taking Road under Public Works Act.
				Bush-clearing.	Scrub-clearing.	Formation.	Bridges.	Culverts.	Maintenance.			
Counties—	£ s. d.	£ s. d.	£ s. d.	Chains.	Chains.	Chains.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		
Mongonui ..	6 4 7	..	6 4 7	..	..	..	..	..	6 4 7	..
Hokianga ..	82 8 0	..	82 8 0	300	..	4	..	..	..	..
Bay of Islands	85 5 2	..	85 5 2	..	36	6	5 19 0	..	64 16 0	..		
Whangarei ..	91 18 0	..	91 18 0	120	150	50	..	10 12 6	18 0 8	..		
Hobson ..	12 8 4	..	12 8 4	..	..	3	..	8 0 0	..	..
Otamatea ..	5 2 4	..	5 2 4	..	..	5	..	..	..	..
Rodney ..	80 17 8	..	80 17 8	100	100	17	..	8 10 7	5 10 0	..		
Waitemata ..	93 12 4	..	93 12 4	17	3	9	..	18 13 4	14 4 11	..		
Piako ..	1 18 11	..	1 18 11	..	..	..	..	..	1 18 11	..
Tauranga ..	79 3 8	6 13 2	85 16 10	..	..	..	..	..	85 16 10	..
Whakatane ..	6 4 8	..	6 4 8	2	..	8	..	..	..	..
Raglan ..	65 14 9	..	65 14 9	..	..	..	..	..	65 14 9	..
Road Boards—												
Pirongia ..	5 3 11	..	5 3 11	..	..	..	..	2 6 0	2 18 0	..
Mercer ..	1 5 3	..	1 5 3	6	..	..	..	..	..	..
Pukekohe East	10 14 8	..	10 14 8	..	..	5	..	..	..	..
Waitoa ..	85 14 11	..	85 14 11	..	20	10	7 0 0	..	73 0 0	..		
Tauhoa ..	4 10 10	..	4 10 10	12	10	2	0 17 1	..	..	..
Maunu ..	28 1 1	..	28 1 1	..	..	25	..	..	..	..
Onewhero ..	71 18 0	..	71 18 0	35	20	30	..	2 0 0	..	..
Matakohe ..	19 2 9	..	19 2 9	65	..	..	..	..	..	..
Opotiki ..	48 3 1	..	48 3 1	..	4	26	..	8 17 0	3 17 2	18 0 0		
Matakana West	6 15 8	..	6 15 8	..	..	7	..	..	..	..
Waipipi ..	8 11 5	..	8 11 5	..	..	10	..	..	..	..
Tokatoka ..	0 15 9	..	0 15 9	..	..	1	..	..	..	..
Otonga East ..	1 15 7	..	1 15 7	..	..	1	..	..	..	..
Kaukapakapa..	8 14 8	..	8 14 8	50	..	..	..	..	0 10 0	..
Wainui ..	12 10 2	..	12 10 2	..	..	3	..	..	..	9 13 8
Awitu ..	7 17 4	..	7 17 4	40	..	..	..	..	2 10 10	..
Hunua ..	1 19 10	..	1 19 10	..	..	2	..	..	..	..
Whangaparaoa	3 2 0	..	3 2 0	..	31	..	..	..	..	..
Omaha ..	13 3 11	..	13 3 11	24	10	15	..	..	..	..
Parua ..	1 5 11	..	1 5 11	12	..	..	..	..	..	..
Mauku ..	2 0 8	..	2 0 8	..	..	5	..	..	..	..
Te Puke ..	16 4 9	5 4 2	21 8 11	..	..	..	..	..	21 18 11	..
Opapeke ..	2 11 1	..	2 11 1	5	..	..	..	..	..	..
Pokeno ..	7 14 2	..	7 14 2	..	..	10	1 0 0	..	..	..
Totals ..	980 15 10	11 17 4	992 13 2	788	384	254	14 16 1	58 19 5	367 1 7	27 13 8		

REPORT ON ROADS BY MR. C. W. HURSTHOUSE, ROAD SURVEYOR.

Tunnel to Karioi.—This road has been located and an engineering survey of it made, from the Mokau Railway-station to Taumarunui, a distance of 43 miles 7 chains, of which a length of 4 miles 55 chains is in bush, all of which, except a patch of 8 chains in length, is situated at the tunnel end. Of the above 43 miles 7 chains, 5 miles 50 chains is road which has been constructed by the Public Works Department some five years ago, except bridges, and now only requires to be repaired and have the bridges built. This 5 miles 50 chains is in seven detached pieces, and was included in the survey for convenience in letting the work. The whole of the land traversed by this road is, I should say, only second-class. The flats, which exist only in the valleys, are not good soil, except in small patches. The hills, which occupy by far the larger area, are, generally speaking, fair soil that will carry grass, and many of the hills are forest-covered. The principal rivers or streams to be crossed are the Paritikonā, Mangapei, Ohinemoa, Paraketu, Ongaruhe, and Taringamotu. The latter two will probably require bridges, comprising one 70ft. or 80ft. span in each, with appropriate end spans; the others will take from 30ft. to 40ft. single spans. There are numerous other streams that will require smaller bridges, and the usual number of streamlets and swamps requiring culverts and pipes. On the new work the grades are not steeper than 1 in 15, excepting in a few short pieces where unavoidable without going to very great expense. The most severe of these is 25 chains of 1 in 13.2 near the tunnel. On the part made by the Public Works Department, however, there are a few short grades of 1 in 12. No. 1 contract, for 2 miles 68 chains construction, is so nearly completed that I have shown it as completed in the return. It lies between 13 miles 65 chains and 16 miles 53 chains, is nearly all in side cutting, 1 mile 27 chains of it are in bush and the remainder is open fern land. No. 2 contract, for 5 miles of construction, between 34 miles 57 chains and 39 miles 57 chains, has just been let, but work on it has not yet been started. Plans are in hand for No. 3 contract, from 0 miles 0 chains to 6 miles 60 chains, and I hope to have them ready to send to you in about a fortnight. I am not aware that there is any Crown land that will be affected by this road except in a very remote manner.

Waitomo Caves Road, from Hangatiki Railway-station to the Waitomo Caves, 5 miles 36 chains. One petty contract, previously let, has been completed during the year. The other works done have been in the nature of repairs and maintenance. The road runs through first-class land, mixed bush, and open, which, as far as I know, is entirely in the hands of Maoris. I do not think there is any Crown land within 10 miles of it.

Otorohanga to Kihikihi.—Tokanui track: The total estimated distance by this track, between the above places, is 16 miles. The work done is in short pieces, distributed over about 8 miles, and consists of 66 chains of side-cutting, one 18ft.-span and one 16ft.-span bridge, one 6ft. culvert of timber, and eight sets of drain-pipes at seven swamp crossings. The formation done at the bridges, swamp, and one through cutting amounts to 15 chains. About 5 miles of the length, at the Kihikihi end, have been made for some years, including the bridge across the Puniu River. The remaining part of the distance, about 10 miles, is in its natural state, but a cart or buggy can now be driven through. The country traversed is undulating; the land is of fair quality, and open; I should think about 10 to 15 per cent. of the area is occupied by swamp and swampy ground. I have no doubt that this will eventually form a main road. What work has been done has been so placed as to form part of a continuous road without having to be altered. The whole of the land is in the hands, I believe, of the Maoris, with the exception of a few shares in some of the blocks lately bought for the Crown, but which at present are in too nebulous a form, I think, to be considered as tangible Crown land.

C. W. HURSTHOUSE, Road Surveyor.

REPORT OF ROADS ALONG CENTRAL TOURIST ROUTE IN ROTORUA, EAST AND WEST
TAUPO COUNTIES.

Oxford-Rotorua Road.—The past year has been an unfavourable one, owing to the very wet season and the road an unmetalled one. During the year 540 tons of goods passed over it, besides coaches daily. The following works were done towards improving it: 20 chains of side drains, and about 80 chains of out-fall drains, and 6 miles of road was re-formed, besides many stumps being dug out; 20 new culverts were put in, and 12 old ones taken up, repaired, and put down deeper, so as to more effectually drain the road. The roadway is now in fair winter order for an unmetalled one, but it must be metalled before next winter unless the Government intend to bring the railway into Rotorua at once, as owing to this road being so bad in comparison with other roads about Rotorua, many tourists and others are frightened to travel because of the jolting and shaking they get while travelling through the bush. Nearly two thousand six hundred people visited Rotorua last season, and all of them passed over this road, therefore something must be done to facilitate their travelling. The three bridges on this road received two coats of hematite paint, and a set of piles have been added to strengthen the Ngongotaha Bridge. Five surface-men and an overseer have been employed on this road regularly during the past year.

Tauranga to Napier via Taupo.—Taking the road throughout, it is in fair working order. The overseer of the Oxford Road gives his attention to that portion between Tauranga County boundary and Atiamuri, about 56 miles. Eight bridges on this section have been twice painted, and one new bridge, 16ft. span, at Waiohinemaru Stream, been renewed, besides several small culverts put in. With the exception of the small culverts, and the Tahungatara Bridge, which requires renewing, the road-way is in good order. From the junction of Lichfield Road towards Maungaiti and Lichfield, the road is in moderately good order; but the grades up the Maungaiti Hill are steep for waggon-traffic. From Atiamuri Bridge into Taupo the road is very good, but Atiamuri Bridge requires repairing at once. One new bridge, 10ft. span, was built in July last over the poisonous stream near Oruanui. Between Taupo and Tarawera the road is good, and an experiment is being tried of maintaining a portion by piece-work by giving it to a settler living on

the roadside. It is a great pity that small sections of land could not be got alongside these main roads, for then the surface-men could make themselves homes, and the cost of maintenance would be less. From Tarawera to foot of Kaiwaka, at the rivers, five surface-men are constantly employed owing to the difficulty of maintaining this portion. In wet weather the rain scours out the roadway, and in dry weather the wind blows it away. One new bridge 22ft. span, and two frame-culverts, one 4ft. in clear, 24ft. long, and the other 5ft. in clear, 32ft. long, have been constructed, besides eight smaller ones renewed, and many others repaired. The Mohaka Bridge requires redecking, and two frame-culverts are being prepared to replace two small bridges, which are rotten. The grades between Mohaka and rivers are very steep, even 1 in 5 in many places for chains at a stretch, and this a main road. Two new roadmen shelter-huts have been built. Over fifty thousand sheep passed along this road to Waikato last season.

Maketu-Rotorua.—This road has stood very well, although the volcanic mud still prevents the rain sinking through it. As the portion beyond Tikitere turn-off is not much used, nothing has been done on it since March last. The most troublesome place is at Waiwhakareto Stream. The portion between Rotorua and Tikitere is very much used owing to the tourist-traffic, and needs a man constantly upon it, as the rain does so much damage on the flats near Owata. One new culvert 6ft. wide, 33ft. long, has been built at the Waiohewa mill-race, and repairs were done to turn the stream again under Te Ngae Bridge.

Miscellaneous Works.—The principal item under this heading has been the closing of the new channel outlet to Lake Rotorua. This work was done owing to the lake being so low, and thereby interfering with the baths at the pavilion, also to allow of the steamer to pass through from Rotorua to Rotoiti. The work was completed last October, but owing to the lake again rising and frightening the Native owners—their land being flooded 1ft. deep—the embankment was tapped, and the whole of the centre portion carried away to the level of the fascining, so that now the embankment acts as a sluice to drain all the surplus water from the lake. Tenders are let for supplying materials to protect the works as they are, so as the lake will keep about the present level, which does no one any harm. The approach to the Puarenga Bridge—which was carried away after the eruption—has also been repaired, and the bridge raised 42in. higher. A contract, too, has been let to the Natives living at Matawera to make the road again in its old place, as the ravines were scouring out so far to the east of the road, thereby causing considerable detouring to avoid them. Willows, too, were planted at entrance to Ohau Channel to protect the Native land from scouring away, owing to reopening old channel; also the Rotoiti end of Ohau Channel was staked to deepen it, which proved so successful that the steamer was able to get through at the time of the Governor's visit to the Uriwera.

Turangarere-Tokaanu.—The grade survey was commenced in September last, and the first four miles were let to the Ngatituwharetoa Natives on 4th June, and they are making very fair headway with their sections. The bridge over the Tongariro River was commenced last October, and completed on the 31st May, and is well and faithfully built. The whole of the road ought to be open for traffic by the 31st December next, as tenders are invited for the heaviest of the works. Sundry repairs have also been done to the road between Tokaanu and Pouto Bridge. Eight chains of double ditching, with formation and culvert lengthened, at a cost of £30 in all.

Rotoaira-Waimarino.—Under this heading is included the maintenance of the road from Taupo to Tokaanu, 36 miles. The principal works have been removing landslips and making road to Tongariro Bridge. This portion of the road (Taupo to Tokaanu) will require considerable expenditure upon it before it is a safe coaching-road, owing to the side-cuttings being so narrow, especially around the lake, particularly the rocky ones; also the Tauranga-Taupo River is often in flood, besides the smaller streams at Waiotaka and Waimarino, between Tauranga-Taupo and Tongariro Bridge. Between junction of Karioi Road and Papamanuka eight new culverts have been placed, containing a little over 3,800ft. of timber, with 2,000 cubic yards of earthworks, besides chipping 40 chains of tussocks. A maintenance-man was employed for five months repairing about 12 miles of the road between Pouto Bridge and Otoukou—this being the first labour upon it for over two years. Twenty-six thousand feet of totara is also cut and lying at the bridge sites. When these four bridges are built the road-way will be opened as far as Papamanuka Stream. As the culverts and fillings before mentioned have opened up about five miles of road, no further works will be started till these four bridges are finished—Wanganui, Mangapate, Mangatepopo, and Whakatauriraringa.

ROADS TO OPEN LANDS BEFORE SALE.

Rotorua-Waiotapu.—One and a half miles of new road has been formed as a cart-road from Rotowherowhero Lake towards Galatea, but another mile requires forming to allow of the half-mile east of Mangakokomuka being used. Mr. Troutbeck, of Galatea, has improved the road across the Kaingaroa Plains at his own expense, and, as he has kept close to the surveyed road-line, his work will be a considerable saving on my first estimate. Several portions of this roadway between Waikorua and Kakaramea have been widened to allow of bullock-teams using it with safety, but, owing to a want of funds, has not been properly completed. A short deviation—costing about £10—was made to allow of tourists being driven round by Pareheru and viewing the “ash-fields” en route for Waiotapu Valley. This is much used, as the Waiotapu Valley is a great attraction, for, although the distance from Rotorua to Waiotapu Stream is 23 miles, the journey is easily driven in three hours. It is to be hoped that sufficient money will be available to complete the road to Galatea eastward, and particularly to finish the portion on to Wairakei, thereby giving an easier, more pleasant, and perhaps shorter route to Taupo, as, owing to the country being so easy for road-making, tourists could, if this route were opened, go on their journey and get to Wairakei in the same time as it now takes to return to Rotorua, besides the road would cost less to maintain than the present one. Some repairs have been done to the extent of £10 on the old Wairoa Road, and I

am now of an opinion that this road might be again reopened so as to be available for tourist traffic on to Lake Tarawera. My reason for thinking so is, that a portion of the road made two years ago beyond Pareheru is standing the weather well, and the volcanic mud is about the same depth. The three bridges on Waiotapu Road have been repainted; also three culverts, two of them 18in. by 21in., average length 36ft. each, and the other one 18in. by 21in., and 48ft. long. Maintenance-labour is employed when required.

Huka Falls to Puketaratarata.—With the exception of the repairs to Huka Falls Bridge, which required new suspension wire ropes throughout, the principal expenditure has been on that portion of road lately taken along the old track to Wairakei from Rotorua Road. About 3 miles have been improved into a safe cart-road, and will prove a great boon to the travelling public, as the grades are now within the limit. Ordinary maintenance as required has been done from time to time.

JOHN C. BLYTHE, Road Surveyor.

REPORT ON ROADS TO MAIN TRUNK RAILWAY.

THESE roads are situated partly in the basin of the Wanganui River and partly in that of the Rangitikei River, and are chiefly intended to act as feeders to main trunk line from Marton to Te Awamutu; but, besides their prospective connection with this railway, they are designed to open through communication between the low-lying lands of the West Coast and the high open country, of which a great part of the interior of the North Island is composed. They all, with one exception, traverse heavy bush country for most of their length, and the land through which they pass is still chiefly in the hands of the Natives; nevertheless, a large portion of the lands adjacent to the Ohakune-Pipiriki Road already belongs to the Government, as, for instance, the Atuahae Block, the Rangatana and the Waimarino Blocks, and the Awarua Block, through which the Hunterville-Turangarere Road passes, are now being dealt with by the Native Land Court.

1. *The Wanganui-Murimotu Road (Field's Track)*, sixty-four miles in length, establishes communication between Wanganui and Karioi on the Murimotu Plains. About 24 miles are already of dray-road size, the remainder being a good 6ft. bridle-track. The route lies alongside the banks of the Wanganui for 6 miles, then up a tributary of the same river for 10 miles, then up the valley of the Mangawhero River for about 18 miles to Parapara. Here the track leaves the Mangawhero River, climbs a succession of broken spurs between the Mangawhero and Wangaehu Rivers, finally getting on to the Karioi Flats, at 54 miles from Wanganui. The altitude above sea-level increases from about 20ft. at Wanganui to 2,200ft. at Karioi. If this route be converted into a dray-road, several important deviations will have to be made, or at least tried, chiefly one about 2 miles long, to avoid a bad elbow, and unnecessary ascent at Otuku (28in.), and another—a total deviation—leaving the present track at Parapara, and continuing up the valley of the Mangawhero till a junction is effected with the Ohakune-Pipiriki Road. For the most part this latter deviation would lie over flat lands. There would be no long ascents and descents on ground of an unstable nature, as on the present track, though a certain amount of bad sideling is likely to be encountered. The country passed through is of a much more valuable description. Another item worthy of consideration is that there is more chance of finding suitable metal on this proposed line than on the present one. A considerable extent of the present track lies along steep sidelings of slippery papa. A road in such places is difficult to make and worse to maintain.

Most of the track is already felled and grassed 3 chains wide. On the whole, Field's Track is by far the best travelling-track between the West Coast and Murimotu. There are several gullies at about 24m. which urgently require improvement. I had the honour of reporting upon them last March. There have been two or three men permanently engaged in keeping the track clear from slips, trees, &c., repairing culverts, &c. During the year, besides maintenance, the road party have constructed thirty-eight new culverts, 10 chains new water-tables, 15 chains catch-water drains, besides building a new whare about 3 miles to the south of Parapara. Mr. F. Pemberton, the overseer, has been most energetic in keeping the track in good repair. The total expenditure for the year ending 30th June is £338 0s. 4d. The returns of traffic for the same period are: Travellers on horseback, 2,779; pack-horses, 1,205; sheep, 2,979; cattle, 67; pigs, 75.

2. *Kuripapanga-Karioi Road.*—This road establishes dray communication between Napier and Karioi, on the Murimotu Plains. It lies almost entirely through open country of high altitude. Starting from Kuripapanga the Ngaruroro River is crossed by a good truss bridge; then by long ascents and descents of grades up to 1 in 8, till the Taruarau River is crossed by a ford at 9m. Then a very long rise of about 2,000ft. on to the Ohauko Flats, which extend for about 8 miles, when the descent to the Rangitikei River commences, the ford being at 24m.; then a long ascent of 1,500ft. on to the table-land, on which Birch's station is situated; then down to the Moawhango River at 39m. (altitude 1,400ft.). This road has already been passable for horse-drays for about two years. From Moawhango the new road to Karioi has been constructed during the past year. Contracts for a 14ft. dray-road with culverts, &c., extending over 22 miles (in which, however, there were only 12 miles of actual formation), were let, and completed at a total cost of £1,649 3s. 11d. The parts intervening between these contracts were either repaired, formed, tussocked, or improved, as was required, by day-labour. The new road follows up a tributary of the Moawhango for 7 miles, when the basin of the Hautapu is reached, along which the road continues for 12 miles; the Waitangi Valley is then followed down till the Wangaehu is crossed at 3 miles from Karioi. During last summer a weekly coach ran as far as Moawhango, and next summer it will be able to extend its journey to Karioi at least, if not to Tokoaanu. The Waipawa County Council maintains the road as far as the Rangitikei River; thence to Moawhango Mr. Birch has attended to the most necessary repairs out of his own rates. From Moawhango to Karioi (29 miles) the maintenance and repairs have been attended to by the day-party under Mr. C. Field, at a cost of

£433 12s. 4. This includes cost of inspection, 25 chains new formation, extensive repairs over 4 miles of old formation, 880 lineal feet of new culverts, about 6 miles of tussocking, and the erection of fourteen sign-boards at junctions and other necessary places. The road was in good repair at the beginning of June, but during the winter it will require occasional repairs, especially on the newly-formed parts. The traffic on this road is heavy, and, being mostly bullock-dray traffic, is very severe on the formation. The ford at the Moawhango, though included in one of the completed contracts, could not be made right owing to Native obstruction. This difficulty will have to be arranged before next wool season. About $1\frac{1}{2}$ miles of the road through patches of bush near Turangarere urgently require metalling and a bridge across the Hautapu ought to be erected. When the Hunterville, Turangarere, and Tokaanu-Karioi contracts are completed, this will be the only water not bridged between Taupo and Hunterville.

3. *Hunterville-Turangarere Road*.—This important road-line closely follows the route of the Main Trunk Railway throughout the greater part of its length. The new road commenced at the foot of Vinegar Hill, about $4\frac{1}{2}$ miles from Hunterville (the old road *via* Pokiore being abandoned on account of its being $2\frac{1}{2}$ miles longer, and over wetter ground), and extends up the valley of the Rangitikei for 21 miles, crossing the Makohine ravine at $4\frac{1}{2}$ miles. From 21m. to 30m. the road follows up the Hautapu River, thence to the junction with the Kuripapanga-Karioi Road at 35m. 47c. (altitude 1,800ft.); it keeps along the watershed between the Moawhanga and Hautapu Rivers. Except about 5 miles, it is all through bush country. Up to 11m. the land is already alienated from the Crown, but from there to the end at 35m. 47c., the road for its entire length runs through the Awarua Block. This track was constructed by the Public Works Department about four years ago, but in the course of my engineering survey I had to make several large deviations in order to obtain easier grades, and for the last $6\frac{1}{2}$ miles the road pursues an entirely new course. I have already had the honour to report fully on this change of route. By doing this a saving was effected of about $1\frac{1}{2}$ miles of actual distance and about 8 miles of construction, besides avoiding unnecessary ascents and descents. Taking all the deviations and trial-lines, I made complete engineering surveys of about 50 miles, at a cost of £435.

Since last November 21 miles have been let by contract for a total sum of £9,138 7s. 6d. Fifteen and a half miles are already completed, and the balance will be done in about six weeks, except certain parts, that will have to be postponed till next summer. The road is of standard coach-road widths, and complete in everything except metal, which is only being done where the material would otherwise be wasted. Mr. J. Barron is Inspector, and, under his supervision, the contractors are doing some very creditable work.

There is not the slightest doubt but that this will some day be a very important arterial road. Plans and specifications are already prepared for the remaining $14\frac{1}{2}$ miles beyond what is at present under construction. In order to get the road open for through traffic by next April, it is most urgently to be desired that tenders should be called for this $14\frac{1}{2}$ miles, at the very latest by the 1st September, as well as for metalling the most necessary parts of the road already done. The most expensive part is already completed. The day-party, under Mr. C. Field till October and since then under Mr. J. Barron, has cost £433; this includes, besides inspection, repairs, slips, &c., five new culverts, 40 chains of new formation, sign-boards erected at all junctions, &c. No return of traffic has been kept, but the amount of packing, &c., done is very large. When this work is completed the wool from 120,000 sheep, besides cattle, &c., will come down this way; there is also likely to be a certain amount of industry in timber, and when the coaches start this ought to be the favourite tourist route between Wellington and Auckland.

4. *Ohakune-Pipiriki Road*.—This road is a continuation of the Kuripapanga-Karioi and Karioi-Ohakune Roads, and is intended in future to be carried westwards to join the Stratford Road system. It is also designed to establish communication between the Murimotu country and the Wanganui River, which in turn will afford, when improved, a fine connection with Wanganui.

From Pipiriki the road runs westerly for 8 miles over heavily-timbered flats, thence across the Mangaetoroa Valley, draining into the Mangawhero; at 13m., from Ohakune the Wanganui watershed is reached; thence for 5 miles the road runs along the basin of the Mangoihi, a tributary of the Wanganui; finally reaching Pipiriki at 25m. by a long descent down the Kaukore Creek. The altitude of Ohakune is 1,970ft., while that of Pipiriki is only 1,100ft. This road passes through the Rangataua Block (Government) for about $1\frac{1}{2}$ miles, and through the Atuahae Block (Government) for about 6 miles; branch roads have already been laid off which are intended to tap the Waimarino country northwards, and to join Field's Track to the south. There is a considerable area of good grazing land throughout the extent of this road, but for the first 8 miles or so from Ohakune the forest is especially heavy, and, from its great altitude as well as from its proximity to the snows of Ruapehu, the cold in winter is too severe to allow of sufficient grass for stock. The timber for 15 miles from Pipiriki is almost worthless, but near Ohakune there is abundance of excellent milling material. The road is constructed dray-road-width in patches for about 2 miles from Pipiriki, the rest of the distance there is a 6ft. trenching on sidelings with 1 chain wide of clearing throughout.

The flood which devastated the whole of the Wanganui basin in February caused a great part of the Kaukore Creek siding to slip; two bridges and many culverts were also washed away; to effect all the repairs necessary to re-establish through traffic, cost nearly £200. Much of the corduroying on the flats is also in a bad state. D. Nicoll, who had been overseer on this road for over three years, was quite unable to keep the road in even fair order. He has resigned and been succeeded by C. Field. The cost of the day-party for the year ending 30th June has been £461 14s. The February slips caused a great increase in the total sum above what was anticipated.

All except the centre 9 miles is now prepared for contracts for the conversion of the track into a dray-road. This 9 miles will also be ready by the end of August, so that the whole road could be put through by the end of next summer if sufficient funds are available. The sections at the Pipiriki end should be let first, and, if possible, about the time the new steamer starts on the Wanganui River. The 8 miles at the Ohakune end should not be started before October. The character of the work along the upper parts of the Kaukore Creek, and at a few places further on, is of an exceptionally heavy nature. Being a cross-country road the number of creeks which have to be crossed is very large, and unfortunately timber at the Pipiriki end cannot be obtained. Probably it will have to be brought from Wanganui.

The cost of the engineering survey, with plans complete to date, has been about £12 10s. per mile. Nearly all the old pegs are untrustworthy or entirely gone, and in some cases the line is injudiciously laid out, especially so at creek crossings, besides grades of 1 in 12 have been altered to 1 in 15. This in itself causes considerable deviations. The culverts originally specified were in most cases totally unsuitable for the creeks for which they were respectively intended.

5. *Tunnel Karioi Road (south end).*—This road is designed to act as a service-road to the Main Trunk Railway, besides being the main arterial road through the Waimarino country. From Karioi to Ohakune, $8\frac{1}{2}$ miles, is already a good bridle-track, with a chain clearing. Engineering plans are already prepared of this part. By adopting 1 in 15 grades in places and making the work somewhat heavier, I succeeded in shortening the original road by about 30 chains. The survey cost £67. The work on this part is of a nature eminently suited for winter work, and should be let as soon as the votes will allow. The road traverses the Rangataua Block for about 4 miles, the remainder is still Native land. The greater part of the road lies through heavy forest suitable for milling. From Ohakune to Waimarino there is a fair bridle-track with 6ft. trenching, and about 4 miles felled 1 chain wide, the remainder is through standing bush. The distance from Ohakune to the open Waimarino plains (altitude 2,600ft.) is about 16 miles; much of the ground is a cold swampy nature. Three large rivers are crossed, and quite a number of small ones. Two of the large rivers are already spanned by dray-road bridges, 138ft. and 520ft. respectively; the third river is crossed by a wire-bridge for foot passengers, and a ford for horses. The large bridges are already showing signs of decay in parts; much faulty timber has been used in them, and the approaches to them have been chosen with great want of judgment. Nothing has been done on this road during the past year except clearing off a few trees and repairing two small bridges. I have not yet had time to make a proper examination of the country between the Waimarino Plains and the Pipiriki-Ohakune Road, but, as far as I can yet judge, the entire location of the road is very debatable. If possible, the whole road should be kept further to the west. Till a proper exploration is made, I think no expenditure beyond maintenance should be incurred on this line. I am not acquainted with the country between Waimarino and Taumarunui. Of all these roads I have no hesitation in saying that I consider that the Hunterville-Turangarere Road will have, when completed, by far the most beneficial effect in developing and opening up the country generally, and as such it ought to be hurried on without delay.

G. T. MURRAY, Road Surveyor.

NAPIER.

Waiomatitini-Hicks Bay Road.—This is a 6ft. bridle track, and gives access to Crown lands; $3\frac{3}{4}$ miles have been constructed during the year by a party of Natives working under a European overseer, at a cost of £196 10s. 3d. The total length now completed is 5 miles 5 chains; total cost £309 9s. 9d.—equivalent to £38 13s. 8d. a mile. There are about 8 miles more of this road to complete at the Kawakawa end, which should, if possible, be done next summer.

Tologa Bay-Mangatokerau Road.—This is a 3ft. bridle-track; $6\frac{1}{2}$ miles have been completed during the year, and $1\frac{1}{2}$ miles last year: total 8 miles at the rate of £25 a mile. This road was formed to give access to Crown lands, and runs through the Mangatokerau grazing-runs. It is formed throughout on good grades.

Ormond-Opotiki Road.—Two contracts have been let and completed during the year for widening $6\frac{1}{2}$ miles of this road, from a 9ft. bridle-track to a 14ft. dray road: total cost £725 14s. This includes 120 box culverts, 15 being 18ft. long, and 105 9ft., and one bridge 12ft. span, cost per mile £116 2s. 3d. On this road £481 17s. 6d. has also been expended during the year on the wages of surface-men, who have been employed keeping the road in repair, removing slips, trees, &c. Length of road to be maintained is about seventy miles, nearly all of which is in very broken forest country. Through traffic during the year has been about 600. The vote on this road is expended, but it is necessary to keep men on it during the winter months, otherwise traffic will be stopped.

Danevirke to Wainui Road.—There has been one formation contract of 25 chains in length completed during the year, and a bridge of 56ft. in length constructed over one of the streams, commonly known as "Deep Creek." This latter is a great convenience for wheeled traffic, and was a work very much required. The total expenditure for the year for formation works has been £311. There are contracts let for two bridges of 41ft. and 55ft. in length respectively, and the work will probably be completed during the early part of next year. The cost of these two bridges will be about £400.

THOS. HUMPHRIES, Chief Surveyor.

PAYMENTS made to LOCAL BODIES in the HAWKE'S BAY LAND DISTRICT on account of Deferred-payment, Perpetual-lease, and Small Grazing-runs during the Twelve Months ending 30th June, 1891; and Works executed during same Period.

Names of Local Bodies.	Amounts handed over to Local Bodies.	Roads metalled.	Dray-roads formed.	Bridle-roads formed.	Forest-clearing.	Bridges.	Culverts.	Drains.
	£ s. d.	M. ch.	M. ch.	M. ch.	M. ch.	Ft.	Ft.	Ch.
Cook County Council ..	319 15 5	..	11 20	4 56	5 70	67	203	42
Waipawa County Council ..	95 9 10	..	0 10	0 78	0 45	..	350	19
Wairoa County Council ..	203 16 10	..	0 29	2 22	0 70	..	2	..
Weber Road Board ..	948 7 4	0 34	1 40	0 30	1 10	32	220	76
Danevirke Road Board ..	189 18 0	0 71½	0 59½	..	0 75	..	72	..
Kumeroa Road Board ..	469 18 10	1 20	1 40	0 45	6 49½	41	39	28½
Ormond Road Board ..	15 15 2	..	0 30	0 25	..	..	44	24
Waimata Road Board ..	226 6 7	..	2 60	2 20	1 30	24	96	..
Puketapu Road Board ..	143 5 6	..	0 60	..	..	..	75	..
Petane Road Board ..	..	..	..	..	..	..	..	..
Maharashtra Road Board ..	252 6 9	1 0	2 0	0 63	0 74	22	200	..
Norsewood Road Board ..	144 9 9	0 75	1 36½	..	1 15	..	125	..
Danevirke Town Board ..	11 16 10	0 20½	..	..	..	..	..	..
Woodville ..	128 18 4	No returns.						
Maungaataua ..	3 15 11							
Ormondville ..	20 6 0							
Ruataniwha ..	115 5 1							
Patutahi ..	167 2 2							
Ormondville Town Board ..	8 14 0							
Total ..	3,465 8 4	4 60½	22 64½	12 19	19 38½	186	1,426	189½

TARANAKI.

Junction Road from Inglewood Eastward to Ngatimaru.—There was a balance of £132 left unexpended out of authority for £500 for metalling part of the Junction Road—Inglewood to Tarata. No work has been done during the year, and the authority has been rescinded.

Opunake Wharf.—This work is being carried out by the Opunake Wharf Company. The plans of the wharf were approved by the Public Works Department, and the work is to be subsidised to the extent of £1 for £1.

Pukearuhe to Mokau.—The work on this road has consisted of the maintenance of the track between Pukearuhe and Mokau, about 16½ miles, the removal of heavy slips, and the re-formation of part of the road, consequent on the floods of the 13th February last. The surfaceman was paid off on the 9th May, the road having been handed over to the charge of the Clifton County Council.

Roads East of Waitara—Ngatimaru.—The Junction Road from Matero Road to Purangi, 6 miles 58 chains, has been pegged and levelled, and the plans prepared for the formation of either a bridle- or cart-road, as funds will permit. About 1 mile 45 chains of the road, commencing at Matero Road and onwards towards Purangi, has been improved by being culverted and partly formed. As this road passes through lands recently sold, and now being improved, and leads to a large area of unsurveyed Crown lands lying between the Waitara River and the Stratford-Mangaroa line, its construction is of great importance to the settlement of the Crown lands in that part of the district.

Huiroa District.—The expenditure under this item is for felling the bush on roads fronting sections in the Huiroa district, viz., on the Mana, Durham, and Croydon Roads, over 4 miles having been felled at a cost of £1 15s. per acre. The burning, clearing, and cart-road formation has to be done by the local bodies out of deferred-payment and perpetual-lease thirds.

Roads East of Waipuku.—Felling 1 mile 60 chains of Waiwiri Road 1 chain wide, and stump-ing cart-track in centre 12ft. wide. A further contract for similar work on 1½ miles of the road is now in hand, which, with that previously completed, will open 4 miles 10 chains of this road. The bridges, culverts, and formation still require making, and the authorities to hand are insufficient for the purpose.

Eltham and Branch Roads.—A bridge over the Mangawheroiti Stream, Eltham Road, 3 miles to the westward of Kaponga, has been constructed of totara and maire timber, the foundations being concrete piers, and the necessary earthwork approaches have been made. The materials were all of the best description, and the work executed by one of the best bridge builders on the coast. The bridge should, therefore, last, with but few repairs, for over thirty years.

Alfred Road.—The expenditure was for felling the bush on parts of the Gordon and Douglas Roads fronting occupied sections, and for assisting the settlers in making a bridle-track along about 3 miles of Gordon Road, commencing at the East Road.

Mokau Punt.—The expenditure under this item was in connection with securing the Mokau punt, which broke from its moorings during the flood on the 13th of February.

Pukearuhe—Mangaroa, Mimi Road.—The formation of nearly 6 miles of this road was commenced prior to the 1st July, 1890, but nearly the whole of the work has been done since that date. The road has been formed 15ft. wide, graded and culverted, and three bridges have been constructed (one being under 30ft. in length). As papa rock crops out frequently on the road, the cost of maintenance will be heavy for the next two years in clearing away slips. A further length of 4 miles is now being laid off for contract. This road gives access to about 12,000 acres, lately subdivided.

Miscellaneous.—Under this heading is included the felling of about $2\frac{1}{2}$ miles of Kaitoke Road, Hawera district, the felling being 1 chain wide, a cart-way 12ft. wide being cleared and stumped in the centre. The laying-off for contracts of $3\frac{3}{4}$ miles of the Rotokare Road (by Mr. J. Garsed), including plans, &c., and the felling of bush on the Makino and Morea Roads, as described under Item 37, the length felled being about $2\frac{1}{4}$ miles. It also includes the cost of repairs to the Manga-hume Bridge, Eltham Road, the foundation of one of the piers of the bridge having been damaged by floods, and necessitating protection-works.

Mangaroa-Stratford, East Road.—21 miles of this road have been pegged and levelled, and plans have been prepared for contracts—viz., from Stratford to the southern boundary of Mangaere Block. Nearly 4 miles of this work have been let, and the contracts (four in number) will shortly be completed. The work included road-formation, grading, &c., 15ft. wide, bridges, culverts, drains, &c., and would have been now completed but for the unusually wet season which we have experienced. As this road leads to large blocks of land now being settled and to others the surveys of which are in hand, and as there is upon it a heavy and increasing traffic, a considerable portion of it must be metalled, or otherwise it will be impassable during each winter. Stone for broken metal can be obtained for the first 6 or 7 miles, and shell limestone for the remainder.

The total expenditure for the year on the above works, including survey and supervision, has been £3,560 19s. 7d. The number of contracts under supervision was forty. The work now in hand includes four contracts for formation on Stratford-Mangaroa, or East Road; one contract, erection of tourists' house on Mount Egmont; eight contracts bush-road felling, and five contracts felling frontages. All the levelling, mapping, preparation, and supervision of contracts has been done by Mr Robinson.

REPORT ON MONEYS SPENT BY LOCAL BODIES OUT OF GRANTS AND SUBSIDIES UNDER THE SUPERVISION OF THE SURVEY DEPARTMENT.

Vote 83, Item 35.—The Moa Road Board, in order to form and metal the Junction Road from Inglewood towards Tarata, obtained a loan of £1,200 under the Loans to Local Bodies Act, and this was subsidised by £1,200 from the Government. Contracts were let, and the formation-work is nearly completed, and the metalling well in hand. When the contracts have been completed a continuous metalled road will extend from Inglewood to Kaimata Road, and the worst parts of the remainder to Tarihi Road will also be metalled. It is the intention of the Road Board to spend £200 in widening the narrower parts of and improving the so-called "Zigzag."

Vote 83, Items 36, 37, and 43.—The Hawera County Council received two grants, amounting to £123, for improving the Rotokare Road. Of this sum they have spent £122 8s. 6d., partly in formation and partly in felling and clearing for about a mile into the Mangaruangi Block, now under survey. Although this road will open the block from Hawera, distant about 13 miles, the shortest access is by the Anderson Road, by which the block is only 9 miles from the Mountain Road and 10 from the Eltham Railway-station. The county have also expended a grant of £50 in improvement of the Whareroa Road through the reserve of that name.

SIDNEY WEETMAN, Chief Surveyor.

STATEMENT showing PAYMENTS to LOCAL BODIES in the TARANAKI LAND DISTRICT during the Twelve Months ended 30th June, 1891, from "Thirds" of Deferred-payments and Perpetual Lease Lands, and "Fourths" of Small-grazing Runs.

Local Bodies.	Deferred-payment and Perpetual-lease Lands.	Small Grazing-runs.	Total Payments.	Length, Locality, Description, and Particulars of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Clifton County Council ..	56 3 4	..	56 3 4	Chiefly repairs over 10 miles of Junction Road, also on Okoke and Otaraoa Roads.
Hawera County Council	1,164 19 6	..	1,164 19 6	1 mile 34 chains formation on eleven roads; 3 miles bridle-track on three roads; 16 chains felling and clearing; 3 miles logging and stumping on nine roads; 2 miles new metalling on seven roads; 30 chains repairs; 30ft. bridge.
Patea County Council ..	28 4 9	..	28 4 9	$1\frac{1}{2}$ miles, East Road, formation, culverting, and bridging.
Stratford Town Board ..	56 8 5	..	56 8 5	40 chains, Stratford Town, formation, new, 18ft. wide; logging and stumping, 30ft. wide.
Waiwakaiho Road Board	6 14 4	..	6 14 4	About 40 chains, Alfred Road, Egmont district, felling and scrubbing.
Egmont Road Board ..	11 1 6	..	11 1 6	About 4 miles, formation, here and there, on King Road.
Tataraimaka Road Board	1 14 10	..	1 14 10	Timaru Road, formation, no lengths given.
Parihaka Road Board ..	199 15 3	..	199 15 3	Spent on twelve roads in district, lengths and details not given.
Moa Road Board ..	420 6 5	1 12 3	421 18 8	$3\frac{1}{2}$ miles new formation on eight roads; $1\frac{1}{2}$ miles repairs on two roads; 56 chains logging and stumping on three roads; 16 chains metalling on Junction Road; 30 chains scrubbing; 25 chains bridle-road; parts of two bridges, Mangaone and Makara.
Manganui Road Board ..	552 4 4	..	552 4 4	Road formation, new, $8\frac{1}{2}$ miles, 22ft. wide; repairs, 3 miles; scrubbing, $3\frac{1}{2}$ miles, 66ft. wide; logging and stumping, 2 miles 40 chains; metalling and gravelling, 13 chains, 9ft. wide; new bridge, 51ft.: spread over twenty different roads.
Carried forward..	2,497 12 8	1 12 3	2,499 4 11	

STATEMENT showing PAYMENTS to LOCAL BODIES in the TARANAKI LAND DISTRICT, &c.—*continued*.

Local Bodies.	Deferred-payment and Perpetual-lease Lands.	Small Grazing-runs.	Total Payment.	Length, Locality, Description, and Particulars of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Brought forward ..	2,497 12 8	1 12 3	2,499 4 11	
Ngaere Road Board ..	464 5 8	..	464 5 8	New formation, 2 miles 73 chains; felling and clearing, 32 chains; metalling and gravelling, new, 12 chains; metalling and gravelling, repairs, 2½ miles: spread over seventeen different roads.
Waimate Road Board ..	1,245 4 0	..	1,245 4 0	9 miles, new formation, on nineteen roads; 1 mile 10 chains felling and clearing on three roads; 9½ miles logging and stumping on twelve roads; 2½ miles metalling on ten roads; 4½ miles repairs on ten roads.
Patea West Road Board	62 17 7	11 18 4	74 15 11	3½ miles on Makino, Kawaiti, and Ball Roads, cuttings, culverting, scrubbing, and clearing.
Totals ..	4,269 19 11	13 10 7	4,283 10 6	

WELLINGTON.

Manawatu Gorge Road.—A small gang, under the supervision of Mr. R. H. Reaney, cleared eighty-eight slips, comprising 3,080 cubic yards, opened and cleared side drains for 1,980 chains, remetalled holes and ruts for 50 chains, logged-up thirty rubble walls, repaired two platform-bridges and twenty-five culverts, put in 175ft. of new culverts, and re-formed 306 chains of the road surface. The expenditure was £469 9s. 4d., and the road was handed over to the local bodies on the 31st March.

Pahiatua to Palmerston North.—Mr. Reaney executed the engineering survey of 2 miles of this road and prepared plans and specifications. Three contracts, comprising 6 miles 33 chains of bush-work and horse-road formation, 6ft. wide, were completed, the expenditure on the works being £833 14s. 4d. About 5 miles of this road remains to be formed, partly through the Forest Reserve and partly through sold lands on the eastern side of the Tararua Ranges.

Mangatainoka District.—A contract, comprising 2 miles 59 chains of light bush-work, with dray-road formation, including three totara bridges, two 15ft. and one 20ft. span, was completed, the expenditure being £301 17s. 7d. The work was confined to the Hawera-Kakariki Road, which leads to and serves about 7,000 acres of Crown lands on the Mangahao River.

Puketoi.—Mr. Reaney executed engineering survey, with plans and specifications, for dray-road formation of 3½ miles of the road through Mr. Holmes Warren's Tiraumea Station, and two contracts have been let for the work. Mr. Reaney also located a further distance of 7 miles of this road. Mr. R. P. Greville executed the engineering survey with plans and specifications for horse-road formation of 2 miles of the Makairo Road, and the unemployed were put on this work. A day-party, under the supervision of Messrs. J. D. Climie and Reaney, constructed 3 miles of the Aohanga Road as a horse-road. The expenditure on these works was £817 9s. 5d., and the latter road benefits an area of 2,000 acres of Crown lands.

Pohangina to Oroua.—Mr. H. J. Lowe executed engineering surveys of 4½ miles of the Branch and London's Roads, and prepared plans and specifications for 2 miles 25 chains of bush-work and horse-road formation, a contract for which is now in hand. The expenditure on this work was £72 16s. 7d.

Road, Oroua River.—The Kiwitea Road Board was granted a subsidy of £1 for £1 up to £100, with which a portion of the Oroua Valley Road was formed 14ft. wide; the length of the work being 2 miles 1 chain, and the area of Crown lands served 1,400 acres. The sum of £50 has also been expended in the same manner on the Kimbolton Road, but the work has not been completed yet.

Maungakaretu.—The Upper Wangaehu Road Board was granted the sum of £125, with which the road known as Hale's Track was formed 6ft. wide for a distance of 1 mile 79 chains. The area of Crown Lands served is 3,270 acres.

Otamakapua.—Two contracts, comprising 3 miles of bush-work and horse-road formation 6ft. wide, were carried out on the Tapuae Ridge Road, the expenditure being £326 0s. 9d. The area of Crown lands benefited is 3,272 acres.

Waitotara to Omahine.—Three contracts, comprising 5 miles of bush-work and horse-road formation with pipe-culverts, were carried out on the Mangawhio Road, the expenditure being £676 18s. 1d. The area of Crown lands benefited is 5,180 acres.

To Purchase Roads to Crown Lands.—The roads through the following lands were purchased, at a total cost of £231 3s., viz.: Section 15, Block XIV., Apiti, C. London, £31 5s.; Section 9, Block X., Kopuaranga, James Stuckey, £170; Sections 38, 57, and 168, Block V., Puketoi Survey District, W. J. Saunders, £29 18s. The first- and last-mentioned roads led to an area of 28,000 acres of Crown lands.

Miscellaneous.—The sum of £253 was spent in the following manner: W. Siever's compensation for road taken through Section 11, Makara, £189 12s. 6d.; Mrs. E. Moore, compensation for improvements on land taken for road through Section 19, Block XV., Mangohau Survey District, £11 15s.; tents and flies purchased for road parties, £10 6s.; and grass-seed sown on cleared roads, £41 6s. 6d.

An area of 259 acres was cleared and grassed in the various village-homestead settlements in the district, and the sum of £305 10s. 9d. was spent in assistance to the settlers.

JOHN H. BAKER, Chief Surveyor.

STATEMENT showing PAYMENTS to LOCAL BODIES in the WELLINGTON LAND DISTRICT during the Twelve Months ended 30th June, 1891, from Thirds of Deferred-payments and Perpetual-lease lands, and Fourths of Small-grazing Runs.

Local Bodies.	Deferred-pay- ment and Perpetual- lease Lands.	Small Graz- ing-runs.	Total Payments.	Length, Locality, Description, and Particular of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Alfredton Road Board	194 8 11	..	194 8 11	7ch. metalling, 10ft.; 22ch. formation, 12ft.; 87ch. bush-felling, 66ft.; and repairs to main road, Eketahuna to Temui.
Eketahuna Road Board	1,129 19 1	..	1,129 19 1	62ch. metalling, 12ft.; 1m. 44ch. formation, 12ft., 14ft.; 2m. 50ch. felling, 66ft.; 1m. 20ch. clearing, 6ft., 12ft., 16ft.; 4 miles repairs.
Kiwitea Road Board	1,965 2 2	25 11 6	1,990 13 8	113ch. metalling, 12ft.; 521ch. formation, 10ft., 14ft., 16ft.; 288ch. formation, 5ft., 6ft., 8ft.; 604ch. clearing and stumping, 16ft.; 200ch. felling, 66ft.
Mauriceville Road Board	676 14 6	..	676 14 6	40ch. metalling, 10ft.; 109ch. formation, 6ft., 14ft., 15ft.; 36½ch. clearing, 16ft.; 71ch. felling, 66ft.; foot suspension bridge.
Masterton Road Board	99 10 2	..	99 10 2	133ch. felling, 66ft.; 5ch. stumping, draining and culvert, 12ft.; 12ch. track-cutting, 4ft.; 7ch. side-cutting, 12ft.
Motoroa Road Board	266 10 9	..	266 10 9	64ch. bridle-track-formation, 4ft.; and improvements to Motoroa Road.
Manawatu Road Board	454 1 1	..	454 1 1	No work completed.
Mangawhero Road Board	20 5 1	73 2 0	93 7 1	
Pahiatua County Council	3,221 17 2	..	3,221 17 2	390ch. metalling, 10ft.; 467ch. formation, 14ft.; 479ch. track-formation, 8ft.; 452ch. track-clearing, &c., 8ft., 16ft.
Rangitikei County Council	198 19 11	49 7 3	248 7 2	124ch. formation, 10ft., 12ft., 20ft.; 85ch. bridle-track, 4ft.; 160ch. clearing, and several bridges.
Taratahi-Carterton Road Board..	18 15 9	7 13 11	26 9 8	10m. Wainuioru-Kaiwhatu Road, 10m. Wainuioru-East Coast Road; repairs and improvements.
Upper Wanguehu Road Board ..	..	49 15 4	49 15 4	1m. 24ch. formation ft.; and one bridge 27ft. span.
Waitotara County Council	32 14 1	61 0 11	93 15 0	4m. 43ch. formation, 14ft., 2m. side cutting, 4ft.
Waitotara-Momohaki Road Board	66 4 7	..	66 4 7	No work done.
Wellington District Road Board..	34 15 3	..	34 15 3	No work done.
Totals	8,379 18 6	266 10 11	8,646 9 5	

NELSON.

Nelson, Tophouse, and Tarndale (Grant to Waimea County Council).—28 miles of road has been maintained and repaired at a cost of £166 13s. 9d.

Wairoa Gorge Road (Grant £200, Waimea County Council).—This work has been delayed owing to death of contractor. About 40 chains of dray-road has been completed, and contracts have been relet. £119 4s. 9d. has been expended, and the work is in progress. Area benefited, 8,000 acres.

Dovedale Road (Grant £100, Waimea County).—43 chains has been formed, bush cleared, and road stumped. Area benefited, 2,000 acres.

Neudorf-Dovedale Road (Grant £50, Upper Motueka Road Board).—The existing dray-road has been repaired, gradients reduced, and improvements made for a length of 74 chains. Area benefited, 1,000 acres.

Sandy Bay Road (Grants £250 and £50, Riwaka Road Board).—The horse-track in use has been widened, and 1 mile 46½ chains of dray-road has been formed at a cost of £309 11s. Cost over vote has been found by Road Board. Area opened, 5,000 acres.

Little Sydney Road (Grants £90 and £87 7s. 6d., Riwaka Road Board).—1 mile 8½ chains of horse-track 5ft. wide have been completed during this year. Area opened, 2,000 acres.

Riwaka Valley Road (Grant £300, Riwaka Road Board).—40 chains of dray-road has been formed at a cost of £95 17s. 6d.; 5 miles 50 chains survey of road was made at a cost of £45. Area benefited, 5,000 acres.

Foot-bridges, Wai-iti River (Grant £37 10s., Waimea County).—Two footbridges have been constructed. The settlers interested contributed £20 10s. in addition. Area benefited, 1,000 acres.

JOHN S. BROWNING, Chief Surveyor.

STATEMENT showing PAYMENTS to LOCAL BODIES in the NELSON LAND DISTRICT during the Twelve Months ended the 30th June, 1891, from "Thirds" of Deferred-payment and Perpetual-lease Lands, and "Fourth" of Small Grazing-runs.

Local Bodies.					Deferred-pay- ment and Perpetual-lease Lands.	Length, Locality, Description and Particulars of Work authorised by Land Board.
					£ s. d.	
Suburban North Road Board	8 12 0	} Expended upon roads leading to lands leased.
Stoke Road Board	..	..	..	..	17 4 0
Waimea County	..	..	..	..	109 15 3
Dovedale Road Board	..	..	..	..	25 14 10
Upper Moutere Road Board	..	..	..	..	20 13 0
Lower Moutere Road Board	..	..	..	..	4 6 0
Stanley Brook Road Board	..	..	..	..	29 17 0
Motupiko Road Board	..	..	..	..	25 14 8
Tadmor Road Board	..	..	..	..	61 14 2
Motueka Road Board	..	..	..	..	3 13 4
Pangatotara Road Board	..	..	..	..	51 4 6
Pokororo Road Board	..	..	..	..	6 10 4
Riwaka Road Board	..	..	..	..	16 19 2
Takaka Road Board	..	..	..	..	79 10 4
Collingwood Road Board	..	..	..	..	23 4 6
Buller County	..	..	..	..	76 6 10
Inangahua County	..	..	..	..	89 18 8
Grey County	..	..	..	..	43 1 4
Amuri County	..	..	..	..	37 16 2
Total	731 16 1	
Sounds (in hand)	27 19 10	

MARLBOROUGH.

STATEMENT showing PAYMENTS to LOCAL BODIES in the MARLBOROUGH LAND DISTRICT during the Twelve Months ended 30th June, 1891, from "Thirds" of Deferred-payments and Perpetual-lease Lands, and "Fourth" of Small-grazing Runs.

Deferred-payment and Perpetual-lease Lands: Nil.
Small Grazing-runs: Nil.

These have been allowed to accumulate during the year, the amount payable to local bodies being too small to expend advantageously; no payments therefore have been made.

WESTLAND.

MAINTENANCE.

Hokitika to Christchurch Road.—This is a dray-road from the Junction with the Loopline Road to the Canterbury–Westland Divide at Arthur's Pass, the principal mail-road to Westland, and the artery of communication during blockage of sea-ports by stormy weather, &c. Total length 39 miles, maintained by the General Government by day-labour, under the supervision of the Chief Surveyor, a Road Inspector at a weekly wage being in actual charge. Total expenditure for the year, £2,153 5s. 5s. Parts of this road in bad weather are constantly in danger of being injured or destroyed by floods and land-slips from the surrounding mountain sides. A deviation of 23 miles in length has been for some time surveyed and graded, and plans, longitudinal and cross-sections, prepared ready for calling tenders. This deviation, if constructed, would considerably reduce the danger of destruction of the road at present in existence.

Haast Pass-track.—A bridle-track from the mouth of the Haast River to the Haast Pass; total length, 48 miles. £109 12s. 6d. has been expended on the maintenance of this track during the year, included in which sum is the cost of erection of two shelter-huts of corrugated galvanised sheet-iron at points where in flooded states of the rivers travellers are frequently "stuck up." Close by the present sites of these huts were formerly existent wooden ones, which, in the improvidence of the "swagger," have been gradually pulled down and burnt. Numerous damages caused by slips during the severe weather experienced last spring, &c., have been repaired, and the replanking of the bridge over the Wills's River has been commenced. Guide-posts and boards have also been erected at spots where the track leaves the bush and crosses the large expanses of river-flats. When the track is properly formed round the rocky points of the three bad bluffs—a matter requiring some blasting work—no detention to travellers will be caused except during heavy floods, and there will then be no danger of loss of life from attempts to push through by foot- or horse-travellers when the river is up. New selections of 680 acres of land, to which access is given by this track, have been made in the Upper Haast Valley during the year.

CONSTRUCTION.

Hunt's Beach to Makawihō Road.—A bridle-road contract for three miles—clearing 33ft., formation 7ft., metal 4ft., finished—cost £479 18s. 6d. Forms part of the intended continuous Main South Road; also repairs executed—removing bad snags at Makawihō River ford, £3 10s. Makes accessible some 4,000 acres of good land, for portions of which applications are shortly to be made when date for selection is fixed. A bridge of 70ft. in length is wanted over the Manakaiau River to make the communication perfect.

Makawihō to Mahitahi Road.—A bridle-road in continuance of the road last referred to; total length, 7 miles; survey and plans completed. A contract at Mahitahi end of 3 miles 7 chains let; clearing 33ft., formation 7ft., metal 4ft.; price, £485. This contract is almost completed, all the clearing being done; but there remains at date hereof 32 chains each of forming and metalling. The contract date for completion has been exceeded. Progress payments made, £250 15s. 7d. The whole road will give access to 3,000 or 4,000 acres of good land.

Cook's River Flat (to Hunt's Beach) Road.—Also a part of the Main South Road, and intended to complete one of the gaps therein, part has been surveyed (4 miles 57 chains) and of this part two contracts for total length of 1 mile 20 chains are let, total contract price £228 6s. 6d.; clearing 33ft., formation 7ft., metal 4ft. Work on these has only been commenced. Survey is required from the end of the 4 miles 57 chains, above alluded to to Hunt's Beach. When completed the road will give access to 5,000 or 6,000 acres of good land.

Pounamu to Teremakau Road.—Length about 4½ miles, making accessible the balance of former deferred-payment block, and land surrounding on north bank of Teremakau River, about 1,200 acres in all. One mile completed during the year: total completed 2½ miles, clearing 33ft., formation 8ft., metal 5ft. To the credit of the Grey County Council within whose jurisdiction the deferred-payment block above referred to exists, there stands in the local bodies deposit account a sum of £34 15s. 6d., derived from thirds received from payments for holdings in said deferred-payment block.

Jackson's Bay to Cascade and George River Districts Road.—Total length of this road 9 mile 22 chains 70 links. The work done to date by small contracts (of about a quarter of a mile each) issued to the Jackson's Bay settlers is clearing 5 miles 30 chains 70 links; forming 3 miles 22 chains 70 links; metalling, 3 miles 22 chains 70 links. Amount expended during the year £31 18s. 8d. As the last contracts were just completed at end of the month of June; their length is returned, but, as payments are not yet made, they will fall into next year's expenditure. Work finished during the year 1 mile 40 chains.

Paroa to Teremakau Road.—A rough trial survey of this road was made by the Contract Surveyor, E. J. Lord. Length 3 miles 58 chains, and rough estimate of cost of construction has been forwarded for a road, comprising clearing 33ft., formation 17ft., and metalling 12ft., with two bridges over the Saltwater Creek and New River respectively.

PROPOSED ROAD-WORKS FOR YEAR 1891-92.

Cook's River Flat to Hunt's Beach Road.—Survey extension of this road to Hunt's Beach has been recommended. Proposed route traverses a block of good land.

Cascade River to Barn Bay.—This line is required and has been recommended for survey and construction. It will afford closer communication and shipping facilities at an available port from good agricultural and pastoral country, and taps an area deemed to be rich in minerals.

Paroa to Teremakau Road.—If it is decided to construct this road, full working survey, levels, cross, and longitudinal sections, &c., will have to be made, plans and specifications prepared, and tenders invited.

JOHN STRAUCHON, Chief Surveyor.

STATEMENT showing PAYMENTS to LOCAL BODIES in the WESTLAND LAND DISTRICT during the Twelve Months ended 30th June, 1891, from "Thirds" of Deferred-payments and Perpetual-lease Lands.

Local Bodies.	Deferred-payment and Perpetual-lease Lands.	Small Grazing-runs.	Total Payments.	Length, Locality, Description and Particulars of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Westland County Council ..	66 4 5	..	66 4 5	Repairs and additions to Kokotahi and Okarito Roads.
Totals	66 4 5	..	66 4 5	

REPORT ON ROADS UNDER THE CHARGE OF MR. F. WITHER, ROAD SURVEYOR.

1. *Hokitika-Christchurch Road Maintenance.*—That portion of the Hokitika-Christchurch Road between the Kowai River, 3 miles from Springfield, and the summit of Arthur's Pass, about 55 miles from Springfield, has been maintained in good order during the year ended 30th June, 1891, at a total cost of £1,712 19s. 9d.

2. *Christchurch-Hokitika Road Construction in Bealey Valley.*—The construction of a portion of the mail-coach road up the Bealey Valley on the hillside (to be used instead of the track up the river bed, which necessitates crossing the Bealey River a number of times, and in flood-times the coach is frequently delayed) was begun in July, 1888, to give work to the Christchurch unemployed, and the work has been stopped several times in the summer months. After a stoppage for a few months work was resumed in July, 1890, and was continued until the end of October, 1890, when the men were paid off. The work was started again on the 2nd January, 1891, and has been proceeded with continuously since then. The work, which has been in hand since 1st July, 1890, and 30th June, 1891, extends from 47m., 70 chains, to 49m., from Springfield. The greater part of the road formation is finished, but about 15 chains of heavy rock-work still remains to be done, and until that is completed the new road cannot be used for traffic. The money expended for the period above mentioned is £1,929 4s. 9d.

3. *Drainage Works (Lake Ellesmere.)*—In order to carry out the works included in the road and embankment contract, a contract was advertised to let out Lake Ellesmere. The contract was let, the price being £39, and the cost of advertising, inspection, &c., was £11. The road and embankment contract—which comprised making an embankment 20ft. wide on top, 1 mile and 31 chains

long, building a road bridge over the old channel of the Halswell River of one span of 20ft. with flood-gates, and a small embankment 4ft. wide on top and 13 chains long—was undertaken in order to render about 2,000 acres of the Lake Ellesmere Reserve available for settlement. Owing to the lateness of the season when the work was finished, the land has not yet been offered for sale. The cost of this work, together with advertising, inspection, &c., was £504 0s. 9d.

4. *Catlin's-Waikawa Road* (From 1st July, 1890, to 30th June, 1891).—The bush-falling, 1 chain wide, from the McKenzie bridge (Catlin's Township) to the beach at Taupupu Bay, from the Taupupu River to Taupupu Bay and up the Taupupu Valley about 4 miles, has been done except a portion of the first 3 miles, which was felled before the end of June, 1890. Contracts Nos. 3, 4, 5, and 6, having been let and partially finished some time previous to 30th June, 1890. The logging up and clearing a space 40ft. wide in the centre for formation has been done from the McKenzie Bridge to the beach at Taupupu Bay, with the exception of about 60 chains.

The bush-falling 100ft. wide and logging up and clearing 50ft. wide up the Catlin's River, a distance of 4 miles, commencing at the Catlin's Bridge, was practically finished before 30th June, 1890, and the formation contracts which have lately been let, do not yet render the land more accessible. The formation on the Catlin's-Waikawa Road, including culverts from the McKenzie Bridge to the North Purakaunui Stream, a distance of nearly 5 miles, has been begun and finished during the year. The McKenzie Bridge, a single span of 20ft. has been built, and the Catlin's Bridge, comprising five spans of 30ft. each, has also been built. In addition the approaches to the Catlin's Bridge have been in hand, but are not quite finished. The approaches to the McKenzie Bridge have been made. Between the North and South Purakaunui Streams the formation and culverts are in a forward state for a further distance of about 1 mile, and the bridge over the North Purakaunui Stream, a single span of 20ft., is nearly finished. The cost of the Catlin's Bridge, without approaches, was £648 9s. Grass-seed was sown on the road clearing up the Catlin's River, at a cost of £31. The cost of bush-falling, logging-up and clearing culverts, small bridges, sowing grass-seed, and formation, has been £3,240 9s. 5d.

5. *Road to Mount Cook and Glaciers, Tourist Tracks*.—A track has been made up the Tasman Valley from the terminal face of the Tasman Glacier to the Ball Glacier, so that tourists can without difficulty walk up to the Ball Glacier, or ride and take pack-horses. Near the Ball Glacier a galvanized iron-hut lined with felting has been built with bunks for eight persons, and there is a partition so that ladies can occupy one compartment and gentlemen the other. Supplies can be stored at this hut for intending climbers, and in case of bad weather climbers have good shelter without having to go right back to the Hermitage. The length of track made up the Tasman Valley is about 6 miles (a considerable distance did not require making.) A few chains of track were made from the wire-rope and cage near the end of the Mount Cook spur down to the level of the Tasman Valley. Near the Hermitage, and about 10 chains below the terminal face of the Mueller Glacier, a light wire foot-bridge of 220ft. span has been thrown over the Hooker River, and a track up the Hooker Valley has been commenced. The track has been made from the bridge about half a mile up the valley; then there is a break on a rocky bluff of about 15 chains, and after that the track is made up to the terminal face of the Hooker Glacier. The expenditure for these works has been £550 8s. 6d.

6. *Ohau-Pukaki Road*.—The direct road from the Ohau Traffic-bridge to the finger-post at the junction of the Mount Cook Road with the Ben Ohau Road on the south side of the Pukaki punt was cleared of large stones and tussocks, and the terraces were graded and formed, so that it is now used for traffic. The cost, including advertising, &c., was £113 4s. 6d.

FREDERICK WITHER, Road Surveyor.

CANTERBURY.

STATEMENT showing PAYMENTS to LOCAL BODIES in the CANTERBURY LAND DISTRICT during the Twelve Months ended 30th June, 1891, from "Thirds" of Deferred-payments and Perpetual-lease Lands, and "Fourths" of Small Grazing-runs.

Local Bodies.	Deferred-payment and Perpetual-lease Lands.	Small Grazing-runs.	Total Payments	Length, Locality, Description, and Particulars of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Mackenzie County Council	184 5 6	..	184 5 6	Expended on following roads: From 20271 to 36088, from 19197 to 36086, Burke's Pass Road; from 20547 to Ropihi, from 24037 to 36059, through part 36055, from 9146 to 17371, through 29564 to 27558.
Wakanui Road Board	136 11 11	..	136 11 11	Expended on roads: Fronting Lots 10, 12, 13 of Reserve 264, running from E. corner Reserve 2165 S.W. to 27253, from E. corner of Reserve 2165 to 26577, from 27253 past 26623 to Reserve 2240.
Mount Hutt Road Board	36 18 4	..	36 18 4	Expended on roads: From 28164 to 34032, and up to and past 35795, &c., from 20592 to 31376, road along E. side of 32643.
Arowhenua Town Board	46 12 7	..	46 12 7	Formation of Shaw Street, John Street, Princes Street, shingling part of North Belt, general work on East Belt, all in Town of Arowhenua.
Levels Road Board	3 2 6	..	3 2 6	Repairing bridge in subdivision of Reserve 1263.
Longbeach Road Board	0 11 4	..	0 11 4	Forming roads fronting to and approaching 35754.
Hampstead Town Board	2 5 10	..	2 5 10	Expended on roads round Lots from 1 to 22 of Reserve 1261.
Carried forward	410 8 0	..	1060 12 10	

STATEMENT showing PAYMENTS to LOCAL BODIES in the CANTERBURY LAND DISTRICT, &c.—
continued.

Local Bodies.	Deferred- payment and Perpetual- lease Lands.	Small Grazing- runs.	Total Payments.	Length, Locality, Description, and Particulars of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Brought forward	410 8 0	..	1,060 12 10	
Malvern Road Board	1 5 4	..	1 5 4	Forming road from Lots 5 to 17, through Reserve 1824.
Coldstream Road Board	22 15 9	..	22 15 9	Ploughing few furrows on each side of Main South Road, from Section 57, Hinds Settlement, to Rangitata River, ditto cross roads and where necessary; clear off stones from centre of road named.
Upper Ashburton Road Board	250 9 11	..	250 9 11	Expended on roads to W. of railway leading to lots of Reserves 350, 35808, 35809, 35810, 35820, 35984, 35752.
Waipara Road Board	25 11 2	55 3 10	80 15 0	Cuttings on road leading from Reserve 27752 towards 35157, shingling and improving road to 35151 and 35152.
Waipara Road Board	6 7 0	33 10 0	39 17 0	
South Malvern Road Board	1 19 7	..	1 19 7	Repairs to road running from 10392 to police-station, and on to Reserve 2408.
East Malvern Road Board	30 2 10	..	30 2 10	Expended on part of road S. of Reserve 2417, improvements of roads S.W. and N.W. of subdivisions of Reserve 1935, forming and metalling roads through subdivisions of Reserve 424.
Le Bon's Bay Road Board	6 1 4	..	6 1 4	Opening up road running from S.E. corner of 35953, N.E. about 80 chains.
Geraldine Road Board	79 4 5	..	79 4 5	Forming and repairing: Part Waihi Road, village settlement of Orari; road S. of 35966, part road E. Reserve 1838, road S.W. of Lot 32 of Reserve 349, continuation road W. of Lot 26 of Reserve 349, road through and S.W. of Lot 45 of Reserve 389. Shingling roads: S.W. of Lots 23 and 24 of Reserve 349; W. of Lot 9 of Reserve 349; S. of Lots 12, 13, and 4 of Reserve 389; S.W. of 1, 2, and 3 of Reserve 389.
Temuka Road Board	86 4 4	..	86 4 4	Improving roads: N.W. of Lots 1, 2, 3, 4, Town of S. Rakaia; W. of Lots 1 to 6, subdivision of Reserve 283; N.W. of Lot 37 of Reserve 1831; N.W. of Reserve 176, and part S.E. of 6483, S.E. of 51, 53, part 54, 12188; N.W. Reserves 1486 and 15940.
Waimate County Council	189 17 7	..	189 17 7	Expended on roads: E. of 28262, 35823, 31776, &c., through subdivisions of Reserve 866, through subdivisions of 261, near Ross Town; S.W. of subdivision of Reserve 144, through and N. of subdivisions of Reserve 191.
Waimate County Council	76 1 11	..	76 1 11	
Mount Peel Road Board	86 14 0	..	86 14 0	Expended on roads: From Clayton Road to 36092, road in 30291 to 36093, forming from Cattle Valley Road to 36094, forming road between 27301 and 27302 to 36096.
Rakaia Road Board	197 17 8	..	197 17 8	Expended on road from 31422 to 34458.
Totals ..	1,471 0 10	88 13 10	1,559 14 8	

OTAGO.

Pomahaka Bridge (£1 for £1).—As the Clutha County Council has already spent over £500 on this bridge, a progress-payment of £250 has been approved of by me on the 16th June last, but I have received no information from the Council as to the progress of the work since that date.

To West Coast Sounds.—I believe work has been carried on for a considerable time back towards forming a road by prison labour from Milford Sound to Lake Ada, but I have no information as to details. During the past year Mr. William Snodgrass, of Te Anau Lake, has erected a two-roomed house at the head of the lake, and close to where the Clinton River enters. The material had been placed on the ground by this department, but Mr. Snodgrass erected the house at his own expense on the condition that he would be allowed to occupy it rent-free till June 1895, but with certain provisions as to the accommodation of tourists, &c.

Rankleburn and Tuapeka West.—1 mile 44 chains of road in Tuapeka West has been levelled, &c., and three contracts prepared, but no work has been done on the ground.

Waikoikoi Bridge.—This bridge has been completed by the Clutha County Council at a cost of £150, the amount voted being £125.

Purchase of Roads to Crown Lands.—Only two transactions have been completed under this head—namely, road through Section 1, Block IV., Glenomaru district, amount paid to Mr. James McLay, £9 3s. 10d.; and road through Section 21, Block IV., Glenomaru district, Mr. Robert McLay's property, amount paid him, £45 1s. 6d. These sums, with 13s. for fees, make up a total of £54 18s. 4d.

Haast Pass Track.—During the past twelve months £25 has been spent on this road, under the superintendence of Mr. W. G. Stewart, only where repairs have been urgently required.

Besides the Pomahaka and Waikoikoi Bridges, the bridge over the Catlin's River has been completed during the past year. It is a pile bridge, 150ft. long, in five spans of 30ft. each, and is a very great convenience to all the settlers on the south side of the river. In conclusion, I may state, as regards the Catlin's-Waikawa Road, 6 miles have been formed, and on 3 miles 21 chains the bush has been felled. There is also in Taukupu Valley, a distance of 4 miles over which the bush has been felled, but not logged up.

C. W. ADAMS, Chief Surveyor.

STATEMENT showing PAYMENTS to LOCAL BODIES in the OTAGO LAND DISTRICT during the Twelve Months ended the 30th June, 1891, from "Thirds" of Deferred-payment and Perpetual-lease Lands, and "Fourth" of Small Grazing-runs.

Local Bodies.	Deferred-pay- ment and Perpetual-lease Lands.	Small Grazing-runs.	Total Payments.	Length, Locality, Description, and Particulars of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Taieri County ..	323 16 0	474 10 0	798 6 0	The money is authorised to be expended in making and maintaining roads or bridges leading to or opening up the lands from which the money is derived, but it is not possible to give details.
Maniototo County ..	671 3 0	281 3 10	952 6 10	
Vincent County ..	283 15 1	97 4 11	381 0 0	
Waitaki County ..	192 16 4	142 19 3	335 15 7	
Waihemo County ..	220 5 8	385 12 5	605 18 1	
Waikouaiti County ..	27 8 0	138 5 2	165 13 2	
Clutha County ..	240 13 7	10 7 9	251 1 4	
Bruce County ..	41 10 7	19 6 2	60 16 9	
Tuapeka County ..	298 14 7	118 15 0	417 9 7	
Lake County ..	87 17 5	..	87 17 5	
Mount Stuart Road Board	2 10 0	7 7 6	9 17 6	
Balmoral Road Board ..	4 12 0	..	4 12 0	
Totals ..	2,395 2 3	1,675 12 0	4,070 14 3	

SOUTHLAND.

Jacob's River Bridge Subsidy.—This bridge of 179ft. span was completed during the year at a total cost of £647 6s. 9d., the Government having subsidised the work by a grant of £300.

Mossburn-Te Anau Road.—Out of the subsidy of £50 for special works there was expended between Mararoa River and Te Anau Lake, a distance of 12 miles, £23 8s. on improving this road, and the balance has been allotted to similar works now in progress.

Road, Block IV., Longwood.—A grant of £50 has been expended between Section 78, Block II. and 31, Block IV., Longwood district, in bush-clearing and culverts, over a distance of 120 chains; and the amount was supplemented by £9 from the Wallace County. The works above specified were all under charge of the Engineer to the Wallace County.

Wyndham via Mimihaui to Otaraia.—1 mile of this road was formed for dray-traffic at a cost of £200, the amount of the subsidy. Before this work will be of any service another 2 miles will require to be formed, as the work now stops at the Islay Gorge.

Bridges, Fortrose-Wyndham.—A pound-for-pound subsidy of £250 was granted to the Southland County, and three dray-bridges of 24ft. span each have been erected on masonry piers, having totara and black-pine superstructures. This is a portion of what will be the main road from Wyndham to Waikawa, and will give access to some 30,000 acres of Crown land.

Dome Creek Bridge.—A subsidy of £2 for £1, amounting to £400, was granted to the local body, and was expended upon a bridge 200ft. long, having ten spans of 20ft. each, with 11 chains of approaches. This is the main coach-road from Riversdale to Switzers, and will assist in developing the School Commissioners' endowments and the mining industries of Waikaia.

Waikawa.—£95 was expended on formation of 68½ chains of dray-road, rendering better accessible 10,000 acres. The work included fascining portions of road between Costers and Falls.

Stewart Island.—3 miles and 66 chains of a 6ft. bridle-track were constructed to give better access to the port at Half Moon Bay, and for the convenience of children attending the school.

Roads to Village Settlements.—The county received a grant of £250 for improving road access to the Village Settlements of Makarewa, Woodfield, Argyle, Waianiwa, Royal Bush, Lintley, Longbridge, and Fern Hill; 1 mile and 10 chains were completed, and works are still in progress. Eight contracts are now in hand.

Waikawa Road.—In anticipation of the Government grant the Southland County has expended £228 on the formation of 1½ miles of dray-road, which will render some 20,000 acres of Crown land more accessible. The works are still in progress.

Waikawa Jetty.—One contract is current, and the contractors are preparing staging and hauling timber for piles.

All these works and one contract on Waikawa to Catlin's Road are under the supervision of Mr. Howorth, the Southland County Engineer.

Waikawa to Catlin's Road.—Prior to his transfer to Westland, Mr. Strauchon prepared specifications for eighteen sections of about 1 mile each of this road for felling and stumping contracts, which it was proposed to give working-men out of employ the opportunity of tendering for, and about fifty tenders were received on the 30th June, and 10 miles have since been let to working contractors. Mr. Strauchon also collected sufficient data for getting out specifications for formation contracts for portions of this road.

Orepuke-Waiaru Road.—Mr. T. S. Miller prepared about 5 miles of this road for formation contracts, and two of these, of a total length of 174 chains, have lately been let for £540 8s. 6d. Some 15,000 acres of Crown land will be rendered more accessible by this road.

G. W. WILLIAMS, Chief Surveyor.

STATEMENT showing PAYMENTS to LOCAL BODIES in the SOUTHLAND LAND DISTRICT during the Twelve Months ended the 30th June, 1891, from "Thirds" of Deferred-payment and Perpetual-lease Lands, and "Fourths" of Small Grazing-runs.

Local Bodies.	Deferred-pay- ment and Perpetual-lease Lands.	Small Grazing- runs.	Total Payments.	Length, Locality, Description and Particu- lars of Work authorised by Land Board.
	£ s. d.	£ s. d.	£ s. d.	
Mataura Town Board ..	2 2 4	..	2 2 4	
Lake County Council ..	23 19 11	..	23 19 11	
Oteramika Road Board ..	127 19 4	..	127 19 4	
Wyndham Road Board ..	8 19 10	..	8 19 10	
Knapdale Road Board ..	83 5 8	..	83 5 8	
Southland County Council ..	1,042 8 3	0 8 4	1,042 16 7	
Invercargill Road Board ..	36 7 9	..	36 7 9	
Wallace County Council ..	513 3 9	..	513 3 9	
Lindhurst Road Board ..	27 11 8	..	27 11 8	
Borough of Riverton ..	1 0 0	..	1 0 0	
Borough of Gore ..	47 2 2	..	47 2 2	
Borough of South Invercargill	8 15 7	..	8 15 7	
Totals	1,922 16 3	0 8 4	1,923 4 7	

APPENDIX No. 3.

REPORT ON THE TOPOGRAPHICAL SURVEY OF THE TONGARIRO MOUNTAINS.

SIR,—

Hamilton, June, 1891.

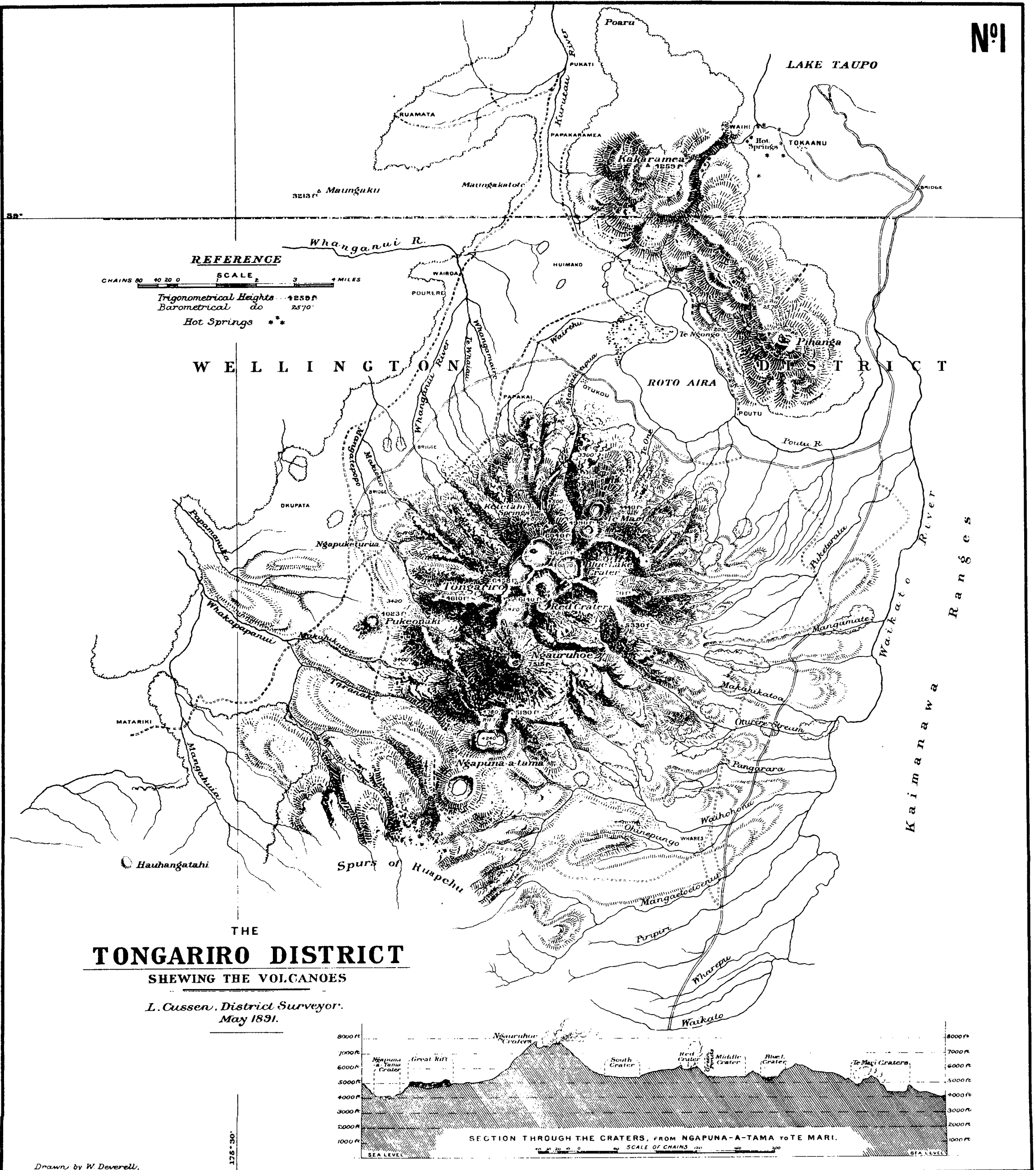
In compliance with your instructions of the 2nd of April last that I should, whilst in the neighbourhood of Tongariro, take the opportunity of making, as complete as possible, a topographical survey of the Tongariro Mountains, I have the honour to transmit herewith maps and drawings, and to report as follows:—

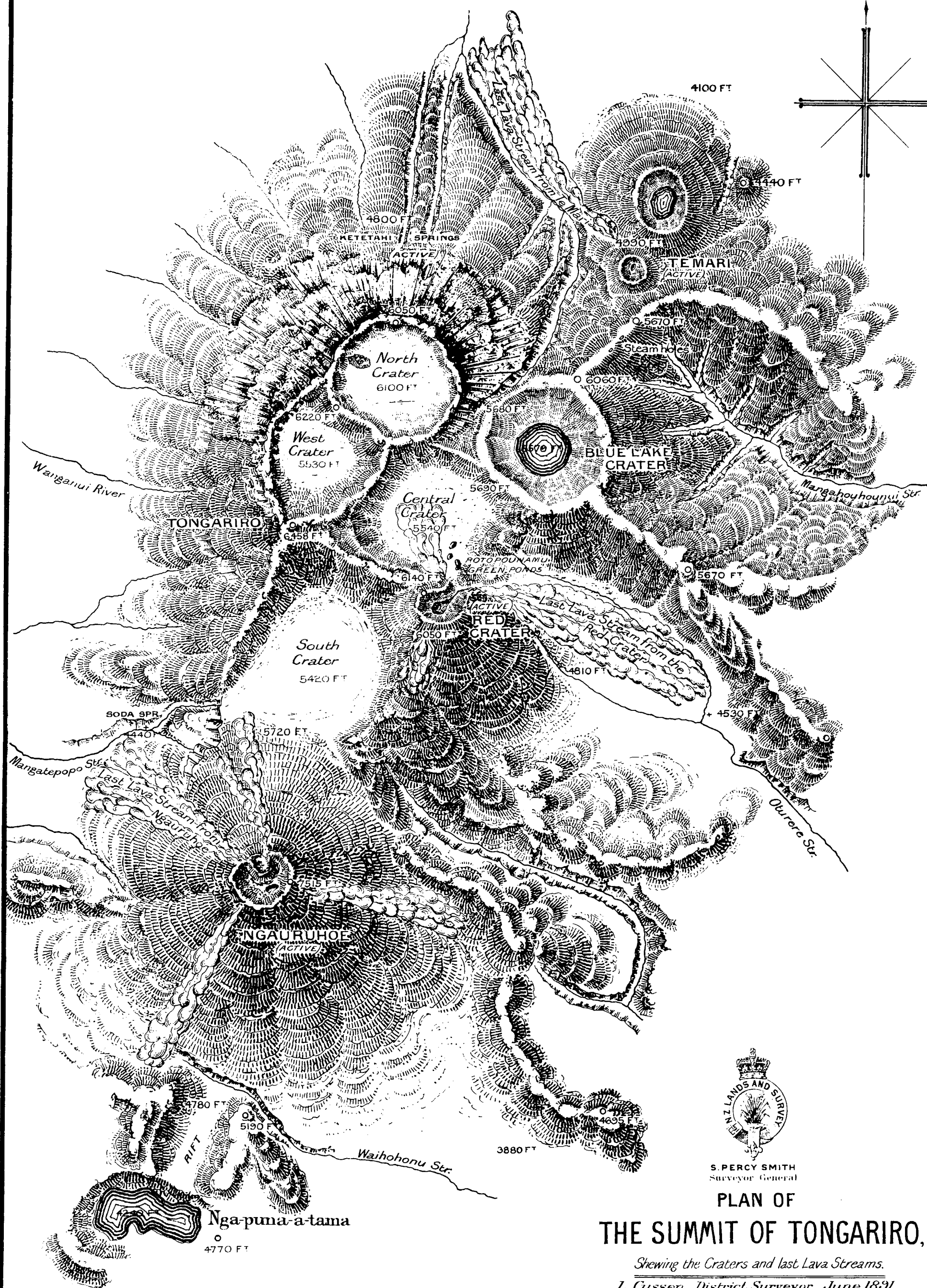
As you are aware, the survey was performed in conjunction with the inspection of the Rangipo subdivision surveys, situated round the east sides of the mountains, and having camped near their base I was enabled to take advantage of the best days for ascending the high peaks. The work has been done with considerable care and attention to detail; points were trigonometrically fixed on the summit of the mountains, the heights of which were determined from the major triangulation, and from these by checked aneroid readings the heights of the various craters and points of interest were obtained.

In the year 1887 I collected specimens of the rocks from these volcanoes, which were examined by Professor Thomas, and described by him in a paper read before the Auckland Institute on the 14th of November of that year. He also refers to them in his "Notes on the Geology of Tongariro and the Taupo District," which appear in the "Transactions of the New Zealand Institute," Vol. xxi., p. 334, from which I am enabled to classify the rocks of most of the lava streams described herein. Map No. 1, which shows the general topography of the district between Taupo Lake and Ruapehu, covering an area of 460 square miles, includes a portion of the country the survey of which I was prevented by unfavourable weather from completing on the occasion of my former visits to the neighbourhood. In Map No. 2, "The Plan of the Summit of Tongariro," I have endeavoured to show as clearly as possible the configuration of the mountain top, delineating especially the more recent lava streams and craters, in which probably the greatest interest will centre.

The craters of Ngauruhoe, the Red Crater, and Te Mari are the three vents from which (in the order mentioned) the latest discharges of lava have taken place. Reference to the map will show that they are (together with the Blue Lake Crater, Nga-Puna-a-Tama Crater, and the warm crater lake on the summit of Ruapehu) all in one straight line, and if the line be produced to the northwards it will pass through the boiling springs at Tokaanu. This line bears $36^{\circ} 30'$ east of north, and if it be still drawn northward, through the Lake country, it will be found to pass through the Whakarewarewa Springs and along the eastern side of Rotorua, in the direction of White Island. Steam is still issuing from Te Mari, the Red Crater, and, of course, from Ngauruhoe, whilst the crater lake on Ruapehu occasionally gives forth a column of steam. The lava streams from Ngauruhoe, the Red Crater, and Te Mari have all the same outward appearance, and apparently are much of the same age—the lava is dark, scoriaceous and heavy, having all the appearance of basalt. I have brought away with me specimens from each of these lava streams, which I hope to have examined within a short time. Tongariro, as seen from the westward, looks like a single great cone with a flat top, nearly three miles wide, with the tall symmetrical sugar-loaf peak of Ngauruhoe towering 7,500ft. high, just beyond its southern rim. As will be seen, however, it is composed of several distinct though dilapidated cones, the lava streams from which have so overlapped in their descent as to form one compact mountain mass at the base. The lower slopes of the mountain are composed of these lava streams; to the westward they spread out over the plateau in broad fan-shaped spurs, between which the streams forming the head tributaries of the Whanganui River take their rise. On the north side they run down to Rato Aira, a distance of 3 miles in sinuous and rather steep spurs, the hill sides being covered, in part, by forest. Round the lower slopes of the mountain on all sides tussock-grass, blue-grass, flax, and fern, and small herb-bearing plants, with bright blossoms and juicy edible berries, grow, the latter in greater abundance than I have seen them anywhere else except on the Kaimanawa Ranges. Large numbers of half-wild horses are at large on the lower slopes of the mountain, and, notwithstanding the great cold in the winter time, they seem to thrive well. Sheep fatten quickly, and excellent mutton is produced on the Tongariro slopes. The wild dogs, however, which inhabit the mountains, and seem to find refuge amongst the steep lava ridges, are a serious trouble to the sheep farmers, and, notwithstanding continuous efforts for years, they have failed to exterminate them. As yet there is little or no vegetation on the summit of the mountain, though surface soil is fast forming, which seems to be of a fertile nature, of a dark, soft, and somewhat spongy loam.

Seen from the eastward Tongariro has a very different appearance to that which it presents on the west. The mountain looks as if it had been cleft by three great rents, which, starting at the summit of the cone, score its sides in a south-east direction for about three miles. In these chasms the Mangahouhounui, Oturere and Waihohonu Streams rise; they are separated by great walls or ridges of rock, which may or may not have been distinct lava streams. In places these walls are 800ft. in height. At the head of the Mangahouhounui, close to the summit of the cone, the chasm spreads out into a crater-like basin, with vertical inward faces of rock which are deeply cleft in many places; the width of the basin is $1\frac{1}{2}$ miles, its depth is from 600ft. to 700ft. It appears like a crater, breached to the south-east where the Mangahouhounui flows, but whether it be so, or a space bounded by the walls of a number of smaller craters, I could not determine. At the head of the Oturere is such another basin as that which I have just described, only the latter is much larger, its width being over 2 miles; to the north its walls are 800ft. in height. They were unmistakably the interior of a crater, but whether it was of the great dimensions it would appear to be from the present configuration it is impossible to say. In wet weather this basin is occupied by a shallow lake.





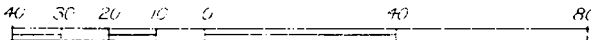
S. PERCY SMITH
Surveyor General

PLAN OF THE SUMMIT OF TONGARIRO,

Shewing the Craters and last Lava Streams.

L. Cussen, District Surveyor, June 1891.

Scale of chains



One of the most recent lava streams of Tongariro, that of the Red Crater (which is described later on), flowed over the floor of this crateral hollow and spread out round the base of its northern walls.

The summit of Tongariro is formed of a number of extinct cones, whose crater walls are in a more or less perfect state of preservation. They record a long series of changes, the volcanic action seeming to have made for itself a new channel at each succeeding change, and the craters appear to have diminished in size in their downward course, the new formation breaking up the walls of their predecessors, and pouring lava streams down the mountain sides in fresh places. It is easy to conceive, had the action continued through one vent, what a mighty volcanic cone might have been built up, as, for instance, was the case at Ngauruhoe.

On the mountain top are now to be seen eight large and well-defined craters, which are for the most part encircled by walls composed of their own ejecta, but partly also by the dilapidated walls of former craters.

The two craters of Te Mari are the farthest north of the group. They are situated at an elevation of 5,000ft. above the sea, or about 1,000ft. below the summit of Tongariro. The lower crater has a diameter of 20 chains and a depth of 120ft; its floor is tolerably level, and generally covered by a shallow lake; its sides are rocky and precipitous. The upper crater is situated 500ft. above the lower one; its diameter is from 8 to 10 chains; it has a crateral cavity in its centre of unknown depth, from which steam is constantly escaping. From the upper crater one of the most recent lava streams of the mountain issued. It flowed in a northerly direction nearly to the margin of Roto-Aira, a distance of about 3 miles; at one mile from the crater its width is a quarter of a mile, and its thickness fully 50ft. The lava is broken up into irregular blocks of various sizes up to 20ft. in diameter; along the surface of the stream in several places are seen peculiar concave ridges, the outer sides of which incline inwards, somewhat like the gunwale of a boat or canoe, thus forming a channel or trough, the outer elevated edges of which cooled first and consolidated, and between them the stream of molten metal flowed. The lava has a rough scoriaceous surface, is very dark and heavy. Professor Thomas describes it as "between the basalt and augite andesites." On the extreme north of Tongariro are seen the remains of a very remarkable crater, which from its situation is designated the North Crater. It is a circular area, 45 chains in diameter, having a nearly flat surface, and being, I may say, a level plain encircled by a cliff of lava, which rises to a height of 200ft. on the south side and about 120ft. on the north side; at other places the flat ground is almost on a level with the crateral rim. Close to its margin, on the west side, is a small crater of funnel-like shape, whose diameter at the mouth is about 10 chains with a depth of 70ft.; from this was ejected at least a considerable portion of materials by which the North Crater was filled up; its surface is now covered with fine volcanic ashes, pumice sand, and lapelli.

On the east of the North Crater, and separated from it by a deep ravine 700ft. in depth and some 20 chains across, is another crater of very nearly the same size as the North Crater. Its walls are perfect on three sides, but somewhat broken away to the south-west. It contains a nearly circular lake, over a quarter of a mile in diameter, and covering some fifty acres of the crater bottom; it is bordered by sloping, sandy beaches, whilst the crater sides slope regularly upwards from 300ft. to 500ft., forming a symmetrical basin-shaped hollow, filled at the bottom with water of the most beautiful blue tint, 5,600ft. above the sea. Immediately to the south-west of the Blue Lake Crater, and separated from it by a lava-ridge 150ft. in height, which forms the common crater-wall of both, is another crateral hollow, some 60 chains in length by 50 chains wide; this is surrounded by lava-ridges, which form the lips of the four surrounding craters. It has an almost flat interior floor, which is in part covered by a comparatively recent lava-stream from the Red Crater. The height of the floor is 5,540ft. above the sea; it may have been the site of a former vent, which seems most probable, or it might have received its circular shape and basin-like appearance from the number of craters which surround it.

Situated upon the steep lava-ridge to the southward of the central crater, and 600ft. above the floor of the latter, is the Red Crater, whose diameter at the mouth is 22 chains. This is probably one of the most interesting points on Tongariro; it shows evident signs of comparatively recent activity; beds of deep-red scoriæ, covered in part with bright-yellow sulphur-incrustations, form its upper portions; its sides are very steep, standing at an angle of forty degrees in places; they are formed of cinder, scoriæ ash, and lapelli. On the north side it is scored by a deep breach formed by a somewhat extensive lava-stream, which, bursting through the cone, flowed down over the rocky interior of the crateral hollow to the eastward of it, dropping a height of fully 1,000ft., and spreading out in a fan-shaped bed over the bottom of the old crater for a distance of a mile or more.

This stream is over a quarter of a mile in width and in places about 30ft. deep; the lava, I believe, to be the same as that of Te Mari Stream, or of a basic character. It is here perhaps more than on any other point on the mountains are exhibited clearly and in most instructive form volcanic phenomena of recent date. Flowing into the central crater is also a lava-stream from this vent, bearing precisely the same character, whilst all around are blocks of the same dark, heavy lava, all having much the appearance of basalt. At the foot of the Red Crater cone, on the north side, are three interesting lakelets, apparently occupying the sites of former volcanic vents; the colour of the water is a bright green, and hence it has received the name of Rotopounamu (or Greenstone Lake). From the Red Crater steam was issuing with great violence and the acid and sulphur-fumes from it were almost suffocating. Looking southward across the Blue Lake Crater, the view includes the two active cones, generally emitting large columns of steam, whilst in the distance are seen the snow-capped peaks of Ruapehu. All around the eye wanders over vast fields and ridges of rugged lava, illustrations of the mighty effects of volcanic action spreading over time far back to comparatively recent dates, and forming a scene which, of its kind, is probably not surpassed, if it is equalled, anywhere in the world.

Two other craters occupy the summit of Tongariro, which, from their positions, are designated the West Crater and the South Crater; their character is generally the same as those already described. The South Crater being more of an elongated form, it stretches as far as the base of the

Ngauruhoe cone. Some of the more recent lava streams from Ngauruhoe are seen flowing down the steep sides of the cone into its floor. Immediately on the north-west side of this crater, and forming portion of its northern wall, stands the highest peak of Tongariro, 6,458ft. above sea-level, the crater-floor to the south of it lying 1,050ft. below; the walls are extremely steep and in many places precipitous, and extend round the north and east sides, the Red Crater being situated on the north-east wall. Sharp, rugged peaks characterise its summit on the south-east side. In this crater the Mangatepopo Stream may be said to take its rise, falling over rugged lava cliffs 1,000ft. into the valley below.

Ngauruhoe, one of the prominent features of the volcanic chain, is a beautifully symmetrical cone, rising in almost sugar-loaf shape from amidst the ruins of former cones, its height above the sea being 7,515ft.; the sides are formed partly of scoræ-ash and cinders alternating with lava streams, the average slope being from 37° to 40° . We ascended the mountain twice during the progress of my survey; it is easiest ascended on the south-west side, where a lava stream flowed down from near the summit to the base, which, though rough and rugged to climb over, affords good footing, its slope varying between 30° and 40° . On reaching the summit on both occasions we found it impossible to see down into the crater, so dense was the column of steam rising from it. Jets of steam and vapour rush out from clefts at every point round the bottom and sides with great force, and with a hissing noise so loud that we could with difficulty hear each other talk; the vapours, charged with pungent gases and acids, were all but suffocating, making it dangerous to approach too close to the crater lips. Occasionally the wind, which came strong from the southwards, blew the steam on one side, and enabled us to get a glimpse of portions of the interior. The crater is almost circular, with steep rugged sides to the east, the upper portions of which are overhanging. The diameter is 25 to 30 chains, and the depth is, I believe, 120ft. On the north-west side, just within the margin of the crater, a second cone has been built up; it is about 150ft. in height, and its crater has a diameter from 5 to 8 chains of regular funnel shape; it is slightly breached on the north-west side where two lava streams have flowed out in recent times, one said to be in the year 1869. Both these streams afford instructive evidence of how steep a slope lava will cool and consolidate at; they extend down the steep cone, almost from the summit to the base, at an angle of 39° . Considerable changes must have taken place in the summit of the cone since Hochstetter visited the district in 1859, as shown by his sketches, and compared to those taken from photographs as the mountain now appears.

The summit has, however, not been much altered since I visited it in the year 1886; a few feet of the overhanging lips on the eastern side, where our trig. station stood, have fallen in, and on the north-east side about 100ft. of the crater margin have also broken down, due to the action of acid vapours. The column of steam from the crater has been much greater and more persistent during my recent visit than I noticed it on former occasions; its density varied considerably at times. I observed an increase of activity when the barometer was falling and a decrease with a rising barometer. The base of the cone covers an area of nearly 4,000 acres; its walls must be well braced together to resist the effects of explosions and the enormous pressure of the ascending lava column, which found release only at the summit, at an elevation of 7,480ft. above the sea-level, or 5,500ft. above the plateau: no fissures appear on the steep sides of the cone from which lava could have flowed. Two miles to the south of Ngauruhoe summit is the interesting crater lake called Nga-puna-a-Tama; it is of an elongated shape, half a mile long from east to west, and a quarter of a mile in width. It is surrounded by high crater walls from 400ft to 500ft. in height and sloping regularly down to the edge of the lake.

Situated in a direct line between this crater lake and Ngauruhoe is a somewhat extensive rift, three-quarters of a mile in length and nearly half a mile wide; its sides are steep and in some places precipitous, being from 300ft. to 400ft. in height. At its northern end some very typical forms of the columnar structure are seen in rhyolite lava (for sketches of which I am indebted to Mr. T. Ryan).

A group of thermal springs at a height of 4,800ft., situated on the north of the Tongariro cone, and called by the Natives Ketetahi, are said to possess powerful medicinal qualities. There are also some mineral springs near the source of the Mangatepopo. One is a soda-water spring of considerable density. The general character of the rocks on Tongariro as stated by Professor Thomas is rhyolite, augite, with andesite, forming the most recent discharges. The last lava streams from Te Mari, the Red Crater, and Ngauruhoe, are of the latter class, and in appearance, texture, and weight are so like basalt that an ordinary observer could not tell the difference.

I should not, perhaps, close my report without a word about the scenery in this district. I scarcely think there is in nature a scene more lovely than that to be viewed from the summit of Tongariro, looking north-east across Roto-Aira and the extinct cones of Pihanga and Kakaramea, and over the grand inland sea of Taupo Lake, whilst from the same point looking south are seen the dilapidated cones and craters of Tongariro summit, with Ngauruhoe's steep cone, and the snow-clad masses of Ruapehu; nor is there, in my opinion, in the colony a more charming journey, so far as landscape is concerned, than that round the margin of Roto-Aira, and along the western slopes of Tongariro and Ruapehu to Waimarino. It is very beautiful to watch the effects of the setting or rising sun amongst these mountains. In the early morning the high peaks are first illuminated, whilst a soft yellow light tips the lower elevations, and soon golden showers spread over mountain and valley, leaving the ravines marked as dark streaks at the bottom. The sunset effects are, perhaps, even still more lovely; the higher peaks are suffused with a crimson glow, whilst the lower slopes are enveloped in dark twilight, the rosy tints remaining with the snowy peaks after the sun has left all the rest of the landscape.

In conclusion I must acknowledge with thanks the assistance which I have derived from Professor Thomas's classification of the rocks of Taupo and Tongariro, and I desire also to express my indebtedness to Mr. T. Ryan for the use of his sketches to illustrate my report, and to Mr. Deverell for his assistance in preparing other drawings.

I have, &c.,

The Chief Surveyor, Auckland.

LAURENCE CUSSEN, District Surveyor.

APPENDIX 4.

REPORT ON THE TASMAN GLACIER BY MR. T. N. BRODRICK.

THIS glacier, the largest in New Zealand, is 18 miles long, and has an average width of 1 mile 15 chains, the widest place, which is opposite the Murchison Valley, is 2 miles and 14 chains, the narrowest, just above the junction of the Rudolph Glacier, is only 60 chains. To insure accuracy in the survey and to leave permanent marks which might be of use hereafter, the triangulation was extended up to the Hochstetter Icefall. The remainder of the survey was conducted by carrying a set of triangles up each valley. The lettered marks on the plan indicate the stations; they were only marked on the ground by a cairn of stones, but the triangles were calculated, because on their accuracy depended the heights of the surrounding mountains, &c.

It is always more or less difficult, in making a survey up a narrow valley, to tell when the highest point of a mountain is visible; to assist in ascertaining this, we ascended the Hochstetter Dome and fixed station Z, 9,179ft. above the sea-level. Many of the peaks on the main range present to the Canterbury side such a rounded appearance that it was very difficult to make sure that my observations were taken to exactly the same point, and it is satisfactory to find how nearly my heights agree with those calculated by Mr. Roberts, from the West Coast side, viz., Mount Dampier, which is, I think, our Hector, 11,323ft.—11,287ft.; Tasman, 11,475ft.—11,467ft.; Haidinger, 10,107ft.—10,063ft., 9,183ft.—9,121ft.: De la Bèche, 10,058ft.—10,040ft., 8,744ft.—8,777ft., and 8,752ft.—8,704ft.

An exact traverse of the terminal face of the Tasman was made on the 21st November, 1890, commencing at sub-trig. Y, which is a large peg with a circular trench round it. This is recorded in Field-book No. 387, page 10; it was made, you will remember, by your directions, in order to ascertain within a reasonable time whether the glacier is advancing or receding. I noticed a considerable change in many places since 1889, but years must elapse before the question can be decided for certain, small fluctuations are sure to occur annually from various causes.

The dotted burnt sienna line along the west of the Tasman marks the horse-track to the tourists' hut, at the Ball Glacier, which we made this season, and about which I have already reported to you. The hut is on the site of Green's fifth camp, which, I consider, to be the safest place available; the spur above it is not high enough for the snow to avalanche to any considerable extent, and an examination of the ground shows that it never has done so. I am afraid there is some chance of damage to be apprehended from the possibility of the soakage from the Ball Glacier forming a small lake between the moraine, the hill, and the shingle slip. However, no place is absolutely safe, and I believe the present site to be the best which could be found; later on I shall say something about the continual changes which are taking place, and it will give you a better idea of the impossibility of saying any particular place is safe. The hut is 19ft. long and 12ft. wide, and divided into two compartments; each compartment has four bunks in it, and a large tin-lined box for blankets, &c., and table. The hut is strongly built of corrugated iron and lined with Willesden roofing-paper. Any one who has been over the road will understand what a tedious job packing and carrying the material up to the site was; most of it had to be carried by the men; only the short pieces could be packed; and it is rather a wonder the animals would carry what they did, for instance, the long iron by which the horse was completely covered all except his legs, the poor brute having to keep his head in one position all the time.

The red line from Trig Z to Mount Cook marks the route taken by Mr. Green in 1882, and Messrs. Mannering and Dixon in 1890, when making the ascent of the mountain. It will be seen from the plan that, although the distance is short, the track is a very steep one, especially from the ice-plateau to the summit. I did not visit the plateau, but its height above the sea-level, where the track crosses it, may be taken to be about 7,000ft., for the point marked 6,903ft. is a rock which is level with the ice-plateau at that place. As the distance to the highest point of Mount Cook is only a little over two miles from the above point, and the rise 5,349ft., the average slope is about 1ft. to 2ft. I am indebted to Mr. Roberts (West Coast Survey) for a plan showing that David's Dome branches from Mount Hector instead of Mount Cook. When I made the survey of the Hooker Glacier I could not get far enough up to see this, but it looked to be a spur of Mount Cook, which I showed it to be. Messrs. A. Harper and Blackiston, who ascended the Hooker Saddle this season, also noticed the same thing, and told me of it on their return; Mount Cook is therefore not on the main range, and is in the Provincial District of Canterbury.

On the map will be found transverse sections of the Tasman Glacier, drawn to a natural scale taken at points C, D, E, and of the Murchison at A. As they are numbered to correspond with the general map they can easily be traced; the black surface represents the moraine-covered portion, the blue the clear ice, and the black chequered part at the ends of the sections the lateral moraines. Section B compares the fall of the Tasman and Murchison Glaciers—the red line being the former, the blue the latter, the dotted lines the respective river-beds, the datum the sea-level. These sections can also be traced on the ground plan by the numbers.

You will see the Tasman is thickly covered with moraine matter; but, except at the sides where large lateral moraines have accumulated, I have every reason to believe the covering is not very thick, and I should say does not average more than from 18in. to 2ft.

From line D to abreast of sub-point T the glacier is very much crevassed along its eastern side; and although crevasses exist in many other places, there is nothing to compare with the huge system I have mentioned. The widening out of the Tasman into the Murchison Valley is very ancient, the lateral moraine there being covered with grass and scrub, but just under Trig. V will be seen

a small stream running from the glacier into the Murchison River. This comes from an ice face, and very likely marks the beginning of one of the constant changes to which I previously referred. In 1889 the ice of the Ball Glacier was much lower than it is now. Its advance has broken down the lateral moraine of the Tasman, about 15 chains below the hut; and from the gap a small stream now runs into the hollow between the glacier and the hills, also in several other places. The western lateral moraine has recently made gaps with small streams issuing from them, which seem to indicate a tendency of the current to set more to the west than it has done for a very long time.

The western lateral moraine is very high, and from where I have marked (huge rock), down to the blue lakes, is several chains in width, and its face in many places covered with scrub. The stream which runs into the Tasman near Trig. X and the blue lakes are fed by percolations from the glacier. The hillocks marked old moraine near the hills are very ancient, and were once covered with scrub, which was burnt off by Nicolo Radove, who sowed cocksfoot grass afterwards; the grass has taken uncommonly well, and there is now fine summer feed all over them. Mr. Man-nering kindly lent me Dr. Von Lendenfeld's map of the Tasman Glacier, published in 1884; I am, therefore, able to remark the great change which has taken place on the surface of the glacier since that time. In 1884 there were two deep depressions, with surface streams running in them, the deepest being near the middle of the glacier. The surface stream from this discharged itself over the terminal face. The depression is shown to be the clear ice of the main glacier, which reached a point within two and a half miles of the terminal face; the other hollow was more to the west, and was the clear ice of the Ball Glacier, which also extended to within two and a half miles of the terminal face, though the stream found its way under the ice before it reached the moraine. Now, a glacier at sections C, D, E shows that the depressions have disappeared, and with them the surface streams, while the clear ice has receded respectively 4 miles (or 6½ miles from the terminal face), and 1½ miles (or 4 miles from the terminal face).

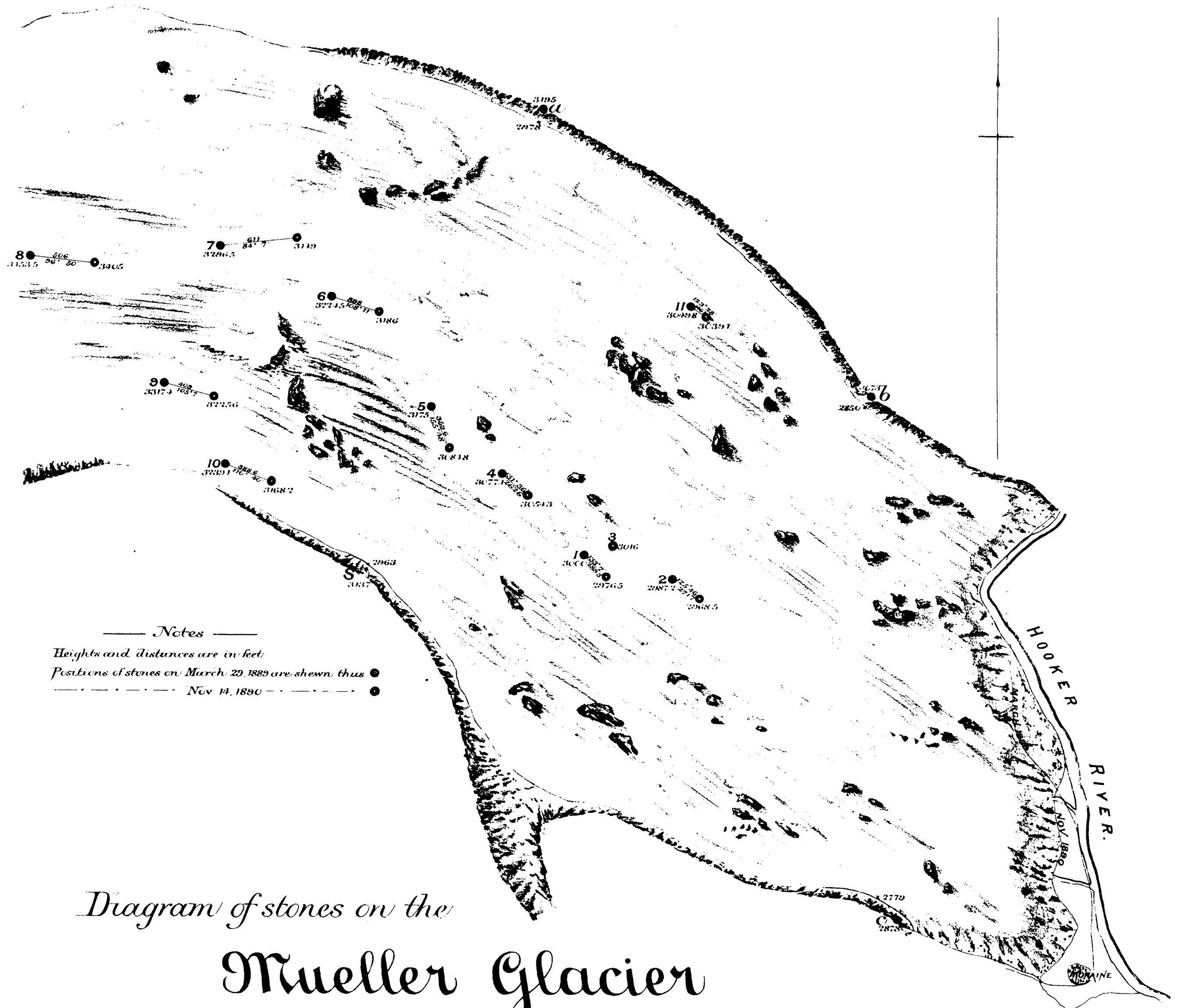
The speed of the Tasman was determined by rods set in the ice along the lines C, D at the numbered points on the 5th December, 1890, and reset again on the 7th January, 1891. That of the Murchison by rods set in a similar manner along line A. The results are recorded in the appended Table No. 2. Here I had better call your attention to a clerical error which was published in my report on the rate of the Hooker Glacier, in order to have it put right this year. It was corrected at the time, as far as Canterbury was concerned, but I regret to say the reports had been distributed to the other provinces before it was discovered. The rates, instead of being so many feet and inches, should have been inches and decimals. The correct rate will be found in the attached table. The green colour on the plan represents scrub, with a few trees amongst it towards the lower part of the glacier. The highest point at which I have seen vegetation growing is 6,500ft., and I doubt if it ever grows at a higher elevation in this part of the country.

As the Government has spent some money in opening up these glaciers, it may perhaps not be out of place for me to make a few remarks on the tourists' traffic. His Excellency the Governor visited the Tasman in January, and was the first to ride up the new track. As it was then incomplete the horses had to be left two miles below the hut, and the remainder of the journey to the Hochstetter Ice Fall was performed on foot. His Excellency expressed himself as very much pleased with the scenery. Since that time many tourists, both ladies and gentlemen, have taken advantage of the facilities afforded by the track and hut to see the wonders of the Tasman, and from what several told me I am inclined to think the money spent will have the effect of increasing the number of visitors. Should it be the intention of the Government to spend any more money, I should like to recommend that the track up the Hooker be carried about four miles further up the glacier, and a shelter hut erected there. At present many tourists never get to the clear ice, and go away disappointed, and with the impression that our glaciers are entirely covered with moraine, and are not worth seeing. This does the traffic harm. The present tracks have done a good deal for the place, but I think not enough. In the time to come a visit to the Hochstetter Dome will no doubt be numbered among the regular trips. From this point a magnificent view is obtained, not only of the East but of the West Coast. The ascent is an easy one, and with common care there is no danger to be apprehended. It has already been visited by one lady (Madame Lendenfeld) in 1883, who accompanied her husband, Dr. Von Lendenfeld, when he was making his survey of the glacier. Any one trying the ascent will find it necessary to camp for one or two nights on the Malte Brun River below point r, where we left a good stout tent pole. From this point it is an easy three hours' walk to the Lendenfeld Saddle, and three and a-half from there to point z, with only about two hundred and fifty steps to cut.

TABLE No. 1, showing comparative sizes of the Canterbury Glaciers.

Name.	Area of Glacier.	Area of Country from which Supply of Ice is Drawn.*	Length of Glacier.		Average Width.		Greatest Width.		Narrowest Width.	
	Acres.	Acres.	Miles.	Chs.	Miles.	Chs.	Miles.	Chs.	Miles.	Chs.
Tasman	13,664	25,000	18	0	1	15	2	14	0	60
Murchison	5,800	14,000	10	70	0	66 ⁷ / ₁₀	1	5	0	42
Godley	5,312	10,560	8	0	1	3	1	55	0	58
Mueller	3,200	7,740	8	0	0	50	0	61	0	37
Hooker	2,416	4,112	7	25	0	41 ³ / ₁₀	0	54	0	30
Classen	1,707	3,972	4	70	0	43 ³ / ₄	0	73	0	21

* This is not the whole watershed, but only that portion on which the nivé snow lies.



Alletsch, in Switzerland, according to Ball, in Alpine Guide—Length 15 miles, average width 1 mile. I think most probably if the average width was obtained by first calculating the area in the manner I have done, this glacier would be found to be much narrower. Ball says it is "fully a mile wide;" but without actual measurement it is not reliable.

TABLE II.—RATES OF GLACIERS.

Tasman.

Line D, near the Ball Glacier; rods first set on the 5th December, 1890, and reset again on the 7th January, 1891.

—				Total Movement.	Average Daily Rate.	Remarks.
				Ft.	In.	
Station 1	27.2	9.9	The numbers correspond with those on the plan.
Station 2	...	...	...	41.0	14.9
Station 3	...	...	...	47.7	17.3
Station 4	...	...	...	48.4	17.6
Station 5	...	...	...	49.6	18.0
Station 6	...	...	...	46.9	17.0
Station 7	...	...	...	44.2	16.1
Station 8	...	...	...	38.3	13.9

Line C ranged from point of Malte Brun Spur; first set on 5th December, 1890, and reset on 7th January, 1891.

				Ft.	In.	
Station 2	6.5	2.4	The numbers correspond with those on the plan.
Station 3	...	...	...	25.9	9.4
Station 4	...	...	...	28.7	10.4
Station 5	...	...	...	32.7	11.8
Station 6	...	...	...	36.6	13.3
Station 7	...	...	...	33.7	12.2
Station 8	...	...	...	34.4	12.5
Station 9	...	...	...	29.0	10.5
Station 10	...	...	...	25.4	9.2
Station 11	...	...	...	13.9	5.0

Murchison.

Line A ranged from point above the Dixon Glacier; first set on the 29th December, 1890, and reset forty-eight hours afterwards.

—				Total Movement.	Average Daily Rate.	Remarks.
				Ft. in.	In.	
Station 78	0 1	0.5	The numbers correspond with those on the plan.
Station 79	...	...	...	0 7	3.5
Station 80	...	...	...	1 4	8.0
Station 81	...	...	...	1 5½	8.7
Station 82	...	...	...	1 2	7.0
Station 83	...	...	...	0 9	4.5
Station 92	...	...	...	9.2	4.6
Station 93	...	...	...	5.2	2.6

Hooker.

Line ranged from peg (f) on a bearing of 101° 43' rods set at fairly regular distances apart on the ice; first at 12 a.m. on the 4th April, 1889, and again on the 7th April, 1889, at 8 a.m.

—				Total Movement.	Average Daily Rate.	Remarks.
				In.	In.	
Station 1	3.3	1.1	The Stations are numbered from west to east.
Station 2	...	...	...	8.2	2.9
Station 3	...	...	...	12.0	4.2
Station 4	...	...	...	15.4	5.4
Station 5	...	...	...	12.8	4.5

Mueller.

Marked stones first observed on the 29th March, 1889, and again on the 14th November. 1890.

				Total Movement.	Average Daily Rate.	Remarks.
				Ft.	In.	
Station	1	239.3	4.8	} See other reports.
Station	2	...	...	271.7	5.5
Station	4	...	...	262.6	5.3
Station	5	...	...	359.6	7.3
Station	6	...	...	398.0	8.0
Station	7	...	...	611.0	12.3
Station	8	...	...	506.0	10.2
Station	9	...	...	409.0	8.2
Station	10	...	...	388.6	7.8
Station	11	...	...	146.1	2.9

Tasman Glacier.—In accordance with your instructions, I ranged the two lines drawn on the tracing across this glacier, first on the 5th December, 1890, and again on the 7th January, 1891; the average rate per day is as follows: Line from the lateral moraine of the Ball Glacier—Station 1, 9.9in.; station 2, 14.9in.; station 3, 17.3in.; station 4, 17.6in.; station 5, 18.0in.; station 6, 17.0in.; station 7, 16.1in.; station 8, 13.9in. Line from point of Malte Brun Spur near Trig. V.—Station 2, 2.4in.; station 3, 9.4in.; station 4, 10.4in.; station 5, 11.8in.; station 6, 13.3in.; station 7, 12.3in.; station 8, 12.5in.; station 9, 10.5in.; station 10, 9.2in.; station 11, 5.0in. In the imperfect state of the survey of this glacier, it is perhaps better not to try to describe it, so I will only remark that the widening out of the glacier into the Murchison Valley is very ancient; the lateral moraine there is covered with grass and scrub, and that the glacier seems inclined to break through the lateral moraine along its western side in several places.

The Murchison Glacier.—The terminal face of this glacier is situated about five miles north-east of the lateral moraine of the Tasman Glacier, is 3,308ft. above sea-level, and the ice face above the outlet of the river is 193ft. high. The Murchison river-bed is a very smooth one, with a fall of about 100ft. to a mile, whilst the average fall of the Tasman Glacier, of which the Murchison is an affluent, to the Pukaki Lake is only 23ft. per mile. In the valley vegetation grows at an altitude of about 6,000ft., and dense scrub at 4,000ft. In its present state the country, even were it accessible to stock, which it is not, is valueless, though on patches which had been burnt a fine native grass, resembling Italian rye, was growing luxuriantly. No plants were found which are not common to other parts of the mountains, except an Alpine variety of anise, which I do not remember having seen before. A stratum of bright red rock crops up in several places along the Liebig Range. I have shown it by a red mark in five different places; the first just opposite the terminal face of the Murchison, the last high on the range, nearly in line with the northern portion of the “bulge” of the Tasman Glacier. It is also visible between Mount Blackburn and Trig. T. The speed of the Murchison was obtained by ranging the line marked on tracing from the spur above the Dixon Glacier. The numbers along the line represent the rods set. They were put in on the 29th of December, and were reset two days afterwards. The average rate for twenty-four hours was—No. 78, .5in.; No. 79, 3.5in.; No. 80, 8.0in.; No. 81, 8.7in.; No. 82, 7.0in.; No. 83, 4.5in.; No. 92, 4.6in.; No. 93, 2.6in.

I have now been over all the most important glaciers in Canterbury, and a great many of the smaller ones as well; but I should say that the Murchison, for reasons which I shall try to enumerate, is the best field for scientific research. To begin with, its moraine is composed of different coloured stones, lying in sections, the most conspicuous of which I have drawn on the plan. From the many views I had of the glacier from points on the hills surrounding it, I was always able to distinguish the particular features which I have shown, and they are placed by observations taken with the theodolite from fixed points. We had such bad weather while we were on this glacier that I could not afford to waste any time, or I might have marked the line of larger hillocks forming the medial moraine between the main and the Malte Brun Glaciers as far as the red band. The two semi-crescent shaped patches shown in red and burnt sienna are most distinct and of the form represented on the tracing. The red evidently came from the Cascade Glacier, for its moraine is of the same coloured rock. The burnt sienna either came from the same place or from the Baker Glacier; the latter, I think, for a small quantity of the same kind of rock is scattered along the northern moraine of the Baker. The large medial moraine (sepia) is smoother than any I have seen on other glaciers, and from (84) to (86) a horse might be ridden along it. The stones are in general small: there is also a large quantity of mud on it. The height is from 60ft. to 90ft. The general appearance of a section would be like that of a formed road—that is, a gradual rise to and slightly flattened crown. Between this moraine and the spur north of the Dixon Glacier a large surface stream often runs, finding its way under the glacier, but by no fixed opening, just below No. 78. There is also a small stream on the other side of the moraine; but it is to the first mentioned I would draw your attention. It is swift, and many perfectly water-worn stones are in its bed. Water-worn stones are to be found throughout the whole length of the main moraine, but, so far as I could see, only on the eastern side. The first pile of them is lying a little below Station 80 on the ranged line; they are not to be found north of that point—at least I looked for but could not find any. To get from the bed of the creek to the place I have indicated the stones would have to be lifted about 100ft.; yet I believe that is the place they came from, and I think the

Dixon Glacier in some manner pushes the ice up. The crevasses marked by blue lines where the clear ice ends are drawn in their correct positions. The current of the glacier sets towards the east, and has caused the large land-slip shown on plan. The rocks on the glacier, especially on the eastern side, are grooved and scratched in all directions; this is uncommon on New Zealand glaciers. Many of the marks are deep and at right angles to the grain, if I may use such an expression. I saw some rocks wedged in between the ice and fixed rocks in the lateral moraine. The marks on them were very newly made, and were evidently caused by grinding against the latter.

The tributary glaciers differ from each other materially; the Onslow, nearest to the terminal face of the Murchison, is apparently stationary at present; the Cascade and Wheeler contribute nothing to the general stream, and have the appearance of dying out. The Baker and Dixon are advancing without any question, especially the former. The Mannering, Harper, and Aida have much the same look as the main glacier. There are one or two small glaciers on the west side of Mount Hutton, which, however, are dying away, and are only worth mentioning because they have complete lateral and terminal moraines, which is unusual for such small glaciers at their altitude. The Cass Glacier is only a rough sketch; the length is about right, but the distances are estimated. The Classen also is only a sketch, except between (91) and Mount Mannering, where it is fairly correct. The Baker and Dixon Glaciers have a peculiar ice formation, which I have not seen elsewhere; the dark-blue lines on them represent lateral ridges of ice about 40ft. higher than the rest of the glacier; these ridges are not more thickly covered with moraine than the ice between them, and their outside faces are free from stones, and very steep. At Station 71, on the south side of the Baker, is the best illustration of what I mean (71) is on the ice ridge; about 70ft. below it is a new lateral moraine in course of formation; this gradually sloping up merges in the ice ridge; below this is a hollow, and then at the bottom of the spur and following it round comes another small grass-covered moraine, showing that at one time this glacier was about 200ft lower than it is now, while three old moraines parallel to the glacier on the spur to the north point to the fact that it has also been much higher. The same signs of constant change may be seen near many of the other glaciers, but the Baker is the best example.

Mueller Glacier.—The map attached hereto shows the positions on the 29th March, 1889, and the 14th November, 1890, of the numbered stones on the above glacier, also the terminal face for the same dates. The stones were found again without any trouble; in many cases they had been carried down without displacing the rods which I put on them in 1889; and as they were only supported on the rocks by piling stones around them, it speaks volumes for the steadiness of the motion. Rock No. 4 has been split by the frost, and each piece has a number on it. No. 7 has slipped down into a large hollow, formerly it was on a ridge of ice; this accounts for its rather erratic motion, and of course it must not be used in estimating the rate of the glacier. The average daily rate of the stones is: No. 1, 4.8in.; No. 2, 5.5in.; No. 4, 5.3in.; No. 5, 7.3in.; No. 6, 8.0in.; No. 7, 12.3in.; No. 8, 10.2in.; No. 9, 8.2in.; No. 10, 7.8in.; No. 11, 2.9in.

I think the relative motions merely confirm what has been already found out by experiments elsewhere, although I do not know whether marks have ever been placed on ice, and their positions fixed in the same way that these have been; if not I would draw attention to the manner in which this method shows the direction as well as the speed of the current. Every care was taken in fixing the positions; different coloured flags were used when the number was invisible from the observing station; in some cases the same distance was calculated from two separate bases and each triangle checked by reducing the stations to the meridian and perpendicular of the trig. station. The changes at the terminal face are principally owing to the Hooker River, which continually alters its course; sometimes running under the ice, as it did in 1889, but more often simply following it round; whichever way it runs the effect is the same—the ice is eaten away underneath, especially in flood time, the upper part falls and great blocks of ice are carried away by the river: I have found them stranded 7 miles lower down. I draw your attention to this, for otherwise it would be difficult to account for the great and constant changes which take place. No doubt a larger amount of snow than usual falling in any particular year would eventually find its way to the terminal face and cause an advance, but the Mueller Glacier, on account of the river, is unsuitable for any experiments at its terminal face; it is also rough and difficult to traverse, but I have carried out your instructions and traversed it as closely as I was able. While on this subject I may remark that, accepting the mean annual rate of all the stones at a fair basis for determining the speed of the glacier (that is twenty-six years to a mile), and allowing that the snow which falls nearer the terminal face than four miles is either melted by the heat or wasted away by surface streams, and that Mount Sefton contributes nothing to the general stream within three miles of the face, then the snow which forms the most northerly portion of the terminal ice fell eighty years ago; that at the middle might vary between one hundred and two hundred years, but none of it would be under one hundred years old. The most southerly portion would be between one hundred and one hundred thirty years of age. I believe I am correct in this, because I take it that, when two glaciers meet, although they join together and form one stream, they never mingle. I do not know whether this fact would be disputed; I am too far away to be able to refer to a library, but a glance at the tracing of the Murchison Glacier and a perusal of my description of its moraines will convince any one that such is the case. As an instance of the magnitude of the ancient glaciers and the time they must have occupied this valley, it will suffice to say that, at the same rate of speed as the Mueller, the glacier which formed the moraine south of the Pukaki Lake took eight hundred years to carry a stone from the present terminal face of the Tasman to that place. I should say that the average thickness of the moraine lying on the Mueller is about 18in., it would be possible to calculate approximately how long it took this glacier to build up the large moraines between which it now flows.

No. 2.—ABSTRACT of the SURVEYORS employed and of the WORK on HAND in each PROVINCIAL DISTRICT on 1st July, 1891.

Chief Surveyors.	Surveyors employed.		Work on Hand.						
	Staff.	Temporary.	District.	Trig.	Settlement.	Native Block, &c.	Roads, &c.	Town.	Mining and Mineral Leases.
				Acres.	Acres.	Acres.	Miles.	Acres.	Acres.
G. Mueller ..	15	5	Auckland ..	..	103,960	120,831	79½	..	..
S. Westman ..	4	..	Taranaki ..	..	35,310	247,053	13	..	..
T. Humphries ..	7	3	Hawke's Bay ..	..	185,686	1,570	108	..	..
J. H. Baker ..	8	11	Wellington ..	598,400	257,539	515,222	316	..	..
J. S. Browning ..	7	..	Nelson ..	..	12,191	..	..	..	753
H. G. Clark ..	1	..	Marlborough ..	..	6,929	4,500	4½	..	..
J. Strauchon ..	2	..	Westland ..	8,960	10,219	..	225½	..	..
J. W. A. Marchant ..	5	..	Canterbury ..	..	217,861	..	..	..	..
C. W. Adams ..	5	3	Otago ..	38,000	51,616	..	..	..	309
G. W. Williams ..	1	1	Southland ..	..	63,294	..	..	..	..
Totals ..	55	23	..	645,360	944,605	889,176	746½	..	1,062

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

District.	Number.	Cost.	District.	Number.	Cost.
		£ s. d.			£ s.
Auckland ..	762	256 8 9	Westland ..	186	17 10 0
Taranaki ..	122	25 1 0	Canterbury ..	128	40 0 0
Hawke's Bay ..	682	34 2 0	Otago ..	363	117 0 0
Wellington ..	302	43 5 0	Southland ..	339	33 0 0
Nelson ..	133	140 0 0			
Marlborough ..	3	0 7 0	Totals ..	3,020	706 13 9

No. 4.—LAND TRANSFER WORK.

District.	No. of Plans passed.	Deeds and other Instruments examined.	No. of Plans placed on Certificates of Title.	Cost.	District.	No. of Plans passed.	Deeds and other Instruments examined.	No. of Plans placed on Certificates of Title.	Cost.
				£ s. d.					£ s. d.
Auckland ..	165	..	410	583 15 0	Westland ..	223	..	69	94 1 6
Taranaki ..	84	..	157	110 9 6	Canterbury ..	183	634	2,209	570 0 0
Hawke's Bay ..	303	..	80	105 6 8	Otago ..	353	..	692	414 0 0
Wellington ..	104	104	1,830	75 0 0	Southland ..	31	..	458	113 0 0
Nelson ..	149	31	294	192 18 0					
Marlborough ..	8	..	68	13 5 0	Totals ..	1,603	665	6,267	2,271 15 8

No. 5.—RETURN showing the amount of Thirds of Deferred-payment and Perpetual-lease Lands, and Fourths of Small-grazing Runs paid to LOCAL BODIES during the Twelve Months ended the 30th June, 1891.

Name of District.	Amount paid.	Name of District.	Amount paid.
	£ s. d.		£ s. d.
Auckland ..	992 13 2	Westland ..	66 4 5
Taranaki ..	4,283 10 6	Canterbury ..	1,559 14 8
Hawke's Bay ..	3,465 8 4	Otago ..	4,070 14 3
Wellington ..	8,646 9 5	Southland ..	1,923 4 7
Nelson ..	731 16 1		
Marlborough ..	..	Totals ..	£25,739 15 5

No. 6.—RETURN of Work done for other Departments, 1890-91.

District.	Cost.	Remarks.
	£ s. d.	
Auckland ..	877 5 4	Work done by field staff, £417 1s. 8d. Work done by field staff, £159 7s. 9d.
Taranaki ..	167 3 2	
Hawke's Bay ..	233 15 6	
Wellington ..	455 17 11	
Nelson ..	80 8 3	
Marlborough ..	36 0 0	
Westland ..	996 5 0	
Canterbury ..	820 13 2	
Otago ..	1,071 7 5	
Southland ..	32 15 0	
Totals ..	4,771 10 9	

No. 7.—PHOTOGRAPHS.*

Department.	Number of Plates.	Silver Prints.	Bromide Prints.	Transparencies.
Survey	227	...	...	...
Public Works	45	...	...	...
Marine	7	...	...	...
Telegraph	17	...	...	...
Geological	31	...	...	...
Crown Lands	13	...	...	...
Mines	18	...	...	...
Education	3	...	...	...
Railway Commissioners	6	...	...	...
Public Trust Commissioners	7	...	...	...
Defence ... ..	...	15	128	11
Totals	379	15	128	11

* This return is for seven months only, as the records for the preceding period were burnt in the fire.

No. 8.—LITHOGRAPHIC PRINTING from 1st July, 1890, to 30th June, 1891.

Department.	Number of Separate Printings.	Number of Impressions..	
		By Machine.	By Hand.
Survey	396	100,750	23,749
Public Works	54	12,801	2,462
Mines	22	30,600	20
Native	13	19,400	47
Public Buildings	3	...	284
Marine	58	17,840	2,155
Colonial Secretary	9	2,480	156
Justice	16	670	560
Registrar-General	10	445	742
Geological	37	33,338	50
Customs	2	...	700
Treasury	1	...	100
Post and Telegraph	5	250	1,036
Agricultural	3	...	29
Defence	3	100	70
Education	6	470	559
Legislative	5	8,000	...
Property Tax	3	10,680	...
Railways	25	63,400	25
Public Trust	25	24,000	...
Stock	2	120	...
	698	*325,344	32,744

* This is for seven months only, as the records of the preceding period were destroyed in the fire.

No. 9.—ABSTRACT of LITHGRAPHS printed during the Year.

*At the Head Office	348,713 impressions.
Auckland	3,900 impressions, 24 plans.
Dunedin	5,475 impressions, 25 plans.

358,088

Maps and photographs mounted at Wellington, 2,090; maps mounted at Dunedin, 257.

* This is for seven months only, as the records of the preceding period were destroyed in the fire.

No. 10.—STATEMENT showing Position of Village Special Settlements as at 30th June, 1891.

Name of Settlement.	Number of Original Settlers.	Original Settlers now remaining.	Number of Present Settlers.		Total Acreage originally taken up.	Total Acreage now remaining.	Total Acreage laid down in Pasture or Cultivated.	Total Advances to Settlers up to 30th June, 1891.	Interest which should have been paid by Settlers to 30th June, 1891.	Total Interest actually paid to 30th June, 1891.	Further Advances, for which Government will be liable.	Arrears of Interest.
			Resident.	Non-resident.								
North Island—												
Auckland	460	253	201	47	Acres. 22,644	Acres. 12,823	Acres. 2,328	£ s. d. 11,562 12 3	£ s. d. 995 1 3	£ s. d. 542 9 2	£ s. d. 9,083 11 3	£ s. d. 452 12 1
Taranaki	1	1	..	1	50	50	2	..	..	..	..	..
Hawke's Bay	34	13	29	2	237	194	188	836 15 9	141 19 11	141 9 11	254 18 6	0 10 0
Wellington	139	69	115	9	1,920	1,747	1,594	5,720 6 1	550 13 6	448 4 0	760 11 4	102 9 6
Totals	634	336	405	59	24,851	14,814	4,112	18,119 14 1	1,687 14 8	1,132 3 1	10,099 1 1	555 11 7
South Island—												
Marlborough	21	12	9	4	338	231	107	103 15 0	12 8 10	8 10 0	733 16 6	3 18 10
Canterbury	188	127	164	2	6,007	5,215	3,613	2,260 0 0	341 10 0	308 0 0	..	33 10 0
Otago	122	62	60	11	1,780	923	444	1,276 5 0	133 2 6	111 12 3	1,942 5 0	21 10 3
Southland	99	54	44	17	1,009	651	283	1,074 3 5	133 4 8	118 11 7	635 15 2	14 13 1
Totals'	430	255	277	34	9,134	7,020	4,447	4,714 3 5	620 6 0	546 13 10	3,311 16 8	73 12 2
Recapitulation—												
North Island	634	336	405	59	24,851	14,814	4,112	18,119 14 1	1,687 14 8	1,132 3 1	10,099 1 1	555 11 7
South Island	430	255	277	34	9,134	7,020	4,447	4,714 3 5	620 6 0	546 13 10	3,311 16 8	73 12 2
Totals	1,064	591	682	93	33,985	21,834	8,559	22,833 17 6	2,308 0 8	1,678 16 11	13,410 17 9	629 3 9

No. 11.—STATEMENT showing the Length and Character of Roads constructed, improved, and maintained, and the AMOUNT expended thereon, from 1st July, 1890, to 30th June, 1891, and the Area of CROWN LANDS made better accessible by reason of such Expenditure during the said Period.

Vote.	Item.	Name of Work according to Parliamentary Vote.	Engineering Surveys made from 1st July, 1890, to 30th June, 1891.	Expenditure from 1st July, 1890, to 30th June, 1891.		Roads constructed.			Improved.		Maintained.		Area of Crown Land rendered better accessible.	
				£ s. d.	M. ch.	M. ch.	Bridle-track.	Bridges constructed over 30ft. Span.	Dray-road.	Bridle-road.	Dray-road.	Bridle-road.		
80	1	MAIN ROADS.												
	2	Warkworth to Kawakawa .. .. .	..	597 0 0	..	2 0	..	Length. Ft.	M. ch.	..	M. ch.	..	Acres.
	3	Oxford to Rotorua .. .. .	..	605 0 0	..	..	..	..	..	..	33 0	..	..
	4	Tauranga to Napier, <i>via</i> Taupo .. .. .	..	1,978 0 0	..	0 40	..	..	..	..	190 0	..	..
	5	Nelson, Tophouse, and Tairādale .. .. .	..	180 0 0	..	..	..	..	..	..	28 0	..	..
	6	Nelson, Westport, Greymouth, and Hokitika .. .. .	..	1,435 0 0	..	..	..	..	..	..	..	..	..
	7	Hokitika to Christchurch .. .. .	..	3,480 0 0	..	..	..	..	..	..	91 0	..	..
		Haast Pass Track .. .. .	..	110 0 0	..	..	..	..	..	..	48 0	..	
81		MISCELLANEOUS ROADS AND BRIDGES.												
		<i>Auckland</i> —												
	1	Raglan to Waipa .. .. .	..	146 0 0	..	..	..	..	..	..	..	..	..
	2	Raglan Wharf, subsidy of £1 for £1 .. .. .	..	242 0 0	..	..	..	..	..	..	..	..	..
	3	Kaitiaki to Te Aroha (Thompson's track) .. .. .	..	..	..	..	..	..	..	..	..	..	..
	4	Wahi Bridge, subsidy of £1 for £1 .. .. .	..	165 0 0	..	..	..	..	..	..	..	..	..
	5	Tauranga, East Cape, Whakatane, Te Toko, and sundry roads, Bay of Plenty .. .. .	..	315 0 0	..	..	..	..	..	..	..	..	..
	6	Whakatane—Ohape .. .. .	..	75 0 0	..	..	..	..	..	..	..	..	..
	7	Orini Bridge, Whakatane .. .. .	..	299 0 0	..	..	..	..	..	..	..	..	..
	8	Roads and bridges in Native districts .. .. .	..	106 0 0	..	..	..	..	..	..	..	..	..
	9	Maketu—Rotorua .. .. .	..	245 0 0	..	..	..	..	..	..	36 0	..	..
	10	To Waitomo Caves .. .. .	..	410 0 0	..	..	..	..	..	..	29 40	..	..
	11	Otorohanga to Kihikibi (Kawhia—Waipu) .. .. .	..	129 0 0	..	..	..	..	..	..	..	..	..
	12	Mangapai Block .. .. .	..	150 0 0	..	..	..	..	..	..	..	..	..
	13	Waikomiti—West Coast .. .. .	..	150 0 0	..	..	..	..	..	..	5 0	..	..
	14	West Coast roads .. .. .	..	..	..	..	..	..	..	..	..	..	..
	15	<i>Hawke's Bay</i> — Waioamatini to Hicks Bay .. .. .	..	214 0 0	..	3 60	..	..	..	..	..	..	1,020
	16	<i>Taranaki</i> — Junction Road from Inglewood eastward to Ngatimaru .. .. .	..	..	..	..	..	..	..	..	..	..	..
	17	<i>Nelson</i> — Lyell—Westport Bridge .. .. .	..	2,861 0 0	..	..	..	..	..	..	..	..	..
	18	<i>Marlborough</i> — Pelorus District and Rai Valley .. .. .	..	993 0 0	..	..	..	..	..	..	2 39	..	..
	19	<i>Canterbury</i> — Summit Road, subsidy of £1 for £1 .. .. .	..	..	..	..	..	..	..	..	..	..	..
	20	<i>Otago</i> — Bridge over Clutha and Cromwell, subsidy of £1 for £1 .. .. .	..	2,359 0 0	..	..	..	1	127	..	..	..	..
	21	Pomahaka Bridge, subsidy of £1 for £1 .. .. .	..	250 0 0	..	..	..	..	..	..	..	..	..
	22	To West Coast Sounds .. .. .	..	356 0 0	..	..	..	..	..	..	..	..	..
	23	<i>Southland</i> — Jacob's River Bridge subsidy .. .. .	..	300 0 0	..	..	..	1	179	..	..	..	..
24	Mosburn—Te Anau Road .. .. .	..	58 0 0	..	..	..	..	..	..	..	..	..
25	<i>General</i> — Miscellaneous works .. .. .	..	1,538 0 0	..	..	..	..	22 40	..	..	..	..

PROVINCIAL DISTRICT OF AUCKLAND.

[illegible]

LAND DISTRICT OF HAWKE'S BAY.

No. 12—continued.—RETURN of FIELD-WORK executed by the STAFF and CONTRACT SURVEYORS, from 1st July, 1890, to 30th June, 1891.

PROVINCIAL DISTRICT OF TARANAKI.

Surveyor and District.	Minor Triangulation.			Topographical Survey for Selection under "The Land Act, 1887."			Rural and Suburban.			Town Section Survey.			Native Land Court Survey.			West Coast Commission.			Roads, Railways, and Water-races.			Other Work.	Total Cost of Surveyor and Party from 1st July, 1890, to 30th June, 1891.	Remarks.				
	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Acres.	No. of Allotments.	Cost per Allotment.	Total Cost.	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Miles.	Cost per Mile.	Total Cost.	Cost.						
H. M. Skeet. Mimi and Upper Waitara	..	d.	£ s. d.	..	d.	£ s. d.	12,500	21	1.06	660 12 4	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	655 7 4	Rough forest country.			
P. A. Dalziel. Huiroa	10,084	30	1.15	581 16 6	..	..	..	..	..	..	..	..	..	..	..	..	562 3 6	Ditto.				
E. W. Buckeridge. Ngaere	32	3 18 0	124 16 0	..	584 8 3	Exploration of roads through forest country; 16 miles graded.				
Taranaki Office	75 7 10	75 7 10	Harbour soundings, scattered surveys, and erection of tripod signals.				
Contract Surveyors.																												
R. H. Davis. Ngatimaru and Upper Waitara	1,652	5	2.24	181 8 1	600	2	4.38	131 0 9	10.9 10 0 1	1.25 20 0 0	109 4 11	..	457 13 9	(* Heavy forest; graded and compass traverse.			
T. K. Skinner. Paritutu	552	13	3.36	92 11 0	293 0 0	West Coast Commission Reserves and road connecting them.			
John Skinner. Mahoe	6,700	1	1.8	50 0 0	50 0 0	Resurvey and subdivision of old Native reserves. Partly open and partly bush, adjoining very old surveys.			
C. Finnerty. Ngatimaru	8,400	8.72	305 5 5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	305 5 5	Completion of Pahautuhia Block. Whitianga, Taumatamahoe, and Maraekowhai.			
Means and totals	8,400	8.72	305 5 5	24,236	56	1.17	1,423 16 11	7,252	14	4.68	142 11 0	600	2	4.38	131 0 9	43.34	5 17 10	259 0 11	75 7 10	2,983 6 1	Roads through rough forest country.

PROVINCIAL DISTRICT OF WELLINGTON.

Staff.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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* The expenditure on these surveys was defrayed from deposits, and therefore is not charged here to the vote for Survey Department.

No. 12—continued.—RETURN of FIELD-WORK executed by the STAFF and CONTRACT SURVEYORS, from 1st July, 1890, to 30th June, 1891.
PROVINCIAL DISTRICT OF MARLBOROUGH.

Surveyor and District.	Topographical Survey.			Minor Triangulation.			Topographical Survey for Selection under "The Land Act, 1887."			Rural and Suburban.				Town Section Survey.			Native Land Survey.				Gold-mining Surveys.				Roads, Railways, and Water-races.			Other Work.	Total Cost of Surveyor and Party from 1st July, 1890, to 30th June, 1891.	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 Allotments.	Cost per Allotment.	Total Cost.	Acres.	No. of Secs. or Divs.	Cost per Acre.	Total Cost.	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Miles.	Cost per Mile.	Total Cost.	Cost.			
R. F. Goulter (Staff)— Oriieri, Gore, Linkwater, Arapawa, Cloudy Bay, Avon	..	d.	£ s. d.	..	d.	£ s. d.	..	d.	£ s. d.	6,646	25	1/5-6	£ s. d. 489 14 4	s. d.	£ s. d.	d.	£ s. d.	A. R. P.	£ s. d.	..	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	Detached and isolated section survey. Mostly heavy bush and rough hilly country. No cadet assisting. One month's leave of absence and one month in the office.
Gore, Linkwater, Arapawa, Cloudy Bay	11½	12-17	143 0 0	..	611 17 4	Partly bush, partly open country. Includes seven miles land-plan survey under Public Works Act.	
Arapawa, Linkwater, Cloudy Bay	63 0 0	..	..	Observations for variation of compass; also cost of Native Land Court surveys to date.	
A. D. Wilson (Schedule). Linkwater, Wakamarina, Gore	48	1	3/6	8 7 5	..	..	..	..	..	..	..	..	*224 0 0	2	6/7-6	74 5 11	..	..	..	..	82 13 4	Hilly bush country, adjoining old surveys. * Rough hilly country heavy bush. Licensed holding; mineral lease.	
D. D. Dobson (Schedule). Onamalutu	10	2	12/	6 0 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6 0 0	Open country.	
Means and totals	6,704	28	1/5-9	504 1 9	..	..	..	..	..	..	..	..	224 0 0	2	6/7-6	74 5 11	11½	12-17	143 0 0	63 0 0	700 10 8		

PROVINCIAL DISTRICT OF NELSON.

J. Snodgrass	..	..	..	..	..	..	..	..	..	867	13	3/8	158 19 0	36	111	1 3 6	130 8 6	..	..	..	..	514 0 0	16	8/10	227 0 4	5	8 0 0	40 0 0	114 18 0	691 2 2	No cadet. Very rough, mountainous, and bush country. Goldfield. Ditto. Heavy bush rough country. Goldfield. Cadet assisting three months as assistant surveyor.
J. Montgomerie	..	..	..	..	..	..	..	..	..	119	3	3/7-8	21 9 4	..	..	..	..	..	..	..	..	885 0 0	14	6/10-5	304 10 7	..	..	..	357 16 4	700 2 11	
R. T. Sadd and I. D. Thompson	..	..	..	..	..	..	..	..	..	6,439	113	2/3-5	738 2 11	..	..	..	..	..	..	..	..	536 0 0	8	3/0-7	81 14 0	3½	4 11 2	17 2 0	79 13 6	785 2 1	
G. H. Bullard	..	..	..	..	..	..	..	..	..	3,060	56	3/	459 0 0	..	..	..	..	..	..	..	..	2457 0 0	1	1/7-4	198 7 10	..	..	..	..	715 6 4	Heavy bush rough country. No cadet. Transferred to another district. * And topography. † Revision. 18,109 acres, Midland Railway area; 3,242 acres, sectional 42,444 acres, revision; 80,000 acres, triangulation. In progress. Cadet. Open country. ‡ Transferred to another district.
F. S. Smith and F. A. Thompson‡	..	..	..	..	157,813	1½	821 18 10	..	..	611	14	3/6-6	108 8 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	774 12 2	1,357 13 7		
W. D. B. Murray	..	20,000	3½	279 18 4	..	..	..	..	..	2,283	18	2/2-1	248 4 1	..	..	..	..	..	..	..	..	..	..	..	..	21	5 10 0	115 10 0	12 16 9	586 18 5	
F. A. Greenfield	..	..	..	..	..	..	..	..	..	6,467	51	1/6	485 0 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	542 9 3	Rough bush, mountainous. No cadet nine months. Transferred to another district.
Authorised Surveyors	..	..	..	..	..	..	..	..	..	5,817	46	1/11	559 14 6	..	..	..	..	..	..	..	..	326 0 0	9	7/6	119 19 3	5½	8 0 0	45 0 0	..	724 13 9	
Means and totals	..	20,000	3½	279 18 4	157,813	1½	821 18 10	25,663	314	2/2	2,778 18 10	36	111	1 3 6	130 8 6	4718 0 0	48	3/11-4	931 12 0	35½	6 3 5	217 12 0	1,339 16 9	6,103 8 6	Less £1,810, fees paid on surveys during the year.

PROVINCIAL DISTRICT OF WESTLAND.

Staff District Surveyor.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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PROVINCIAL DISTRICT OF CANTERBURY.

J. S. Welch. Ashley	4,529	7	7/3	*143 3 11	35 14 0	721 11 8	Hilly pastoral country. Includes survey of parts of Midland Railway Blocks XLV. and XLVI. * £128 17s. was charged against this survey (Block XLVI., Midland Railway Company), as unfinished work last year. † Unfinished, Block XLV., Midland Railway Company. ‡ Resurveys.
T. N. Prodriek. Mackenzie and Waitaki	150,853	0-42	267 5 7	14,494	2	162 9 0	..	..	..	2,405	14	7/3	100 0 0	..	..	..	..	..	..	..	..	..	..	..	16½	5 8 0	90 0 0	53 0 0	675 3 9	9	§ And topography. Includes Tasman and Murchison glacier country. Sectional work scattered.
G. H. M. McClure. Ashley and Selwyn	..	..	..	..	..	..	7,000	3½	98 15 6	15,286	37	7/5	329 16 0	..	..	..	..	..	..	..	..	..	..	..	9	3 7 0	30 2 0	24 2 3	549 15 9	9	|| Midland Railway Block XLI. Part of sectional work very hilly country. ¶ Resurveys.
L. O. Mathias. Geraldine and Ashburton	..	..	..	..	..	..	..	..	..	15,754	52	7/4	489 0 5	..	..	..	..	..	..	..	..	..	..	..	2	6 9 0	12 18 0	46 11 6	533 2 4	4	Rough, hilly country, and plains.
Means and totals	150,853	0-42	267 5 7	14,494	2	162 9 0	7,000	3½	98 15 6	62,902	131	7/3	1,680 11 1	..	..	..	..	..	..	..	..	..	..	..	27½	4 16 8	133 0 0	159 7 9	2,479 13 6	6	

No. 12—continued.—RETURN of FIELD-WORK executed by the STAFF and CONTRACT SURVEYORS, from 1st July, 1890, to 30th June, 1891.

PROVINCIAL DISTRICT OF OTAGO.

Surveyor and District.	Topographical Survey.			Minor Triangulation.			Topographical Survey for Selection under "The Land Act, 1887."			Rural and Suburban.			Native Land Court Survey.				Gold-mining Survey.				Roads, Railways, and Water-races.			Detention by Native Opposition or other Causes.	Other Work.	Total Cost of Surveyor and Party from 1st July, 1890, to 30th June, 1891.	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 Sections.	Cost per Acre.	Total Cost.	Acres.	No. of Acres or Dives.	Cost per Acre.	Total Cost.	Miles.	Cost per Mile.					Total Cost.	Cost.
John Strauchon. Glenomaru, Tautuku, and Woodland	..	d.	£ s. d.	..	d.	£ s. d.	..	d.	£ s. d.	125	2	2/	£ s. d. 12 9 0	..	..	..	£ s. d.	..	..	..	£ s. d.	11	£ s. d. 14 2 0	£ s. d. 155 2 0	£ s. d.	£ s. d. 4 18 0	£ s. d. 192 9 3	Bush country; not in a goldfield. Road-work in a specially expensive district, owing to the distance food had to be carried and wet weather. No cadet assisting.
David Barron. Rock and Pillar, Naseby, Lauder, Maniototo, Gimmerburn, Blackstone, &c.	32,000	127	0/6½	866 13 4	..	..	..	..	26	1	8/	10 8 0	..	..	..	..	75 6 5	997 2 11	Mostly small grazing runs. Open country; within a goldfield. No cadet.	
John Langmuir. Rankleburn, Crookston, Tuapeka West, Beaumont, &c.	4,734	98	2/6	591 15 0	..	..	..	..	448	12	4/4	97 11 3	4-75	7 18 0	37 10 0	..	32 16 5	810 18 0	Mostly bush, and very rough; within a goldfield. Cadet nine months assisting.	
E. H. Wilmot. Tarras, Cardrona, Wakefield, Skipper's Creek, Humboldt, Dart, &c.	20,000	1-8½	153 5 1	..	..	..	34	3	10/3½	17 10 0	..	..	..	..	1,724	33	4/9½	415 18 0	..	..	..	..	57 10 6	669 16 0	* With topography. Open country, very rough. Had to travel a long way in connection with these surveys. Within a goldfield. No cadet.	
D. M. Calder. Woodlands	10,750	7½	335 18 9	1,500	10	2/2½	167 1 3	..	..	..	..	..	..	..	..	3-75	9 0 0	33 15 0	..	125 16 0	676 3 5	Dense bush, wet, and difficult of access; pioneer track having to be cut. A very expensive district. No cadet.	
W. D. R. McCurdie. Catlin's, Glenomaru, Warepa	5,904	44	2/1½	634 2 10	..	..	..	..	..	..	..	..	..	..	..	..	66 0 0	650 9 0	Heavy bush, wet, and expensive to work. Cadet three months assisting.	
Temporary Surveyors. John Edie. Glenomaru, Catlin's	6,973	56	1/9½	622 10 6	..	..	..	..	..	..	..	..	2	16 3 3	32 6 6	..	5 0 0	662 10 0	All heavy bush land. Had old surveys adjoining to contend with. The road surveys were in five different localities. Have two months' work, May and June, done in Block V., Woodland District, which will appear next year. Not in a goldfield. No cadet assisting.	
C. D. Price. Glenomaru	437	4	15/	323 10 0	..	..	..	..	..	..	..	..	..	..	..	..	..	469 14 0	This surveyor resigned on 31st December, 1890, and on his work being taken up by Mr. Edie, it was found to be unsatisfactory, and therefore discarded, consequently no area could be allowed, thereby raising the rate per acre of previous work. Bush land.	
N. L. Falkiner. Warepa, Clarendon, Woodlands	5,916	0½	13 0 11	..	..	..	3,187	59	2/8½	429 2 6	..	..	..	..	..	..	..	..	2-97	12 7 0	36 13 3	..	78 10 0	440 9 5	All bush; part in a very expensive district. Have had to shift camp five times since September. No cadet. Not in a goldfield.	
H. Maitland. Fee System.	22,923	71	67 16 7	..	..	..	..	..	..	..	..	..	..	830	38	8/5½	350 19 5	..	..	..	..	3-84	1 15 11	6 13 0	16 0 0	139 17 2	538 5 4	Topographical surveys were small grazing runs. Native surveys in rough wooded country. No cadet.
L. O. Beal, jun.	559	23	5/1½	154 2 6	..	..	..	..	..	154 2 6	Very rough, broken, open, rocky country.	
Robert Hay	131	3	5/6½	36 10 0	..	..	..	..	..	36 10 0	Ditto.	
L. D. Macgeorge	325	5	3/7	58 6 6	6 6 0	64 12 6	Rough open country.
T. C. Dennison	155	4	3/9	20 0 0	49	3	20/4½	52 7 0	81 7 0	81 7 0	The gold-mining applications were on seabeaches.
G. M. Barr	150	2	3/8½	22 13 0	9 0 0	31 13 0	Rough rocky country.
John Cumino. Contract.	59	1	3/10½	11 8 0	11 8 0	Rough broken country.
L. D. Macgeorge	14	1	5/8½	4 0 0	1-09	8 11 0	9 7 0	13 7 0	13 7 0	Open country.
T. C. Dennison	4 0 0	4 0 0	4 0 0	Cemetery reserve.
Means and totals	22,923	71	67 16 7	725,916	1½	166 6 0	10,750	7½	335 18 9	955,063	408	1/4½	3,703 14 5	830	38	8/5½	350 19 5	3,471	83	4/11½	859 4 3	29-40	10 11 11	311 11 9	16 0 0	605 0 0	6,494 17 4		

PROVINCIAL DISTRICT OF SOUTHLAND.

<i>Staff.</i> J. Strauchon. Waikawa and Makoreta	..	..	..	..	..	..	..	..	..	7,688	29	1-166/	448 4 1	..	..	..	..	..	..	..	..	..	..	..	..	39 11 10	687 18 11	One half section work in forest, remainder open. Road survey in forest country and expensive district, owing to difficulty of transport and large rainfall. Surveyor working partly in Otago District; no cadet assisting. £256 16s. to be credited to Otago District. Mr. Strauchon promoted Chief Surveyor, Westland District, in May, 1891.
J. Hay. Longwood, &c., and Stewart's Island	82,000	3	85 8 4	72,700	3	908 15 0	..	..	..	2,230	11	2-25/	250 17 6	..	..	..	..	..	..	..	..	..	..	..	..	26 4 0	779 18 6	All forest country; heavy clearing at many trig. stations. Country in Stewart's Island difficult of access, and many miles of bush tracks had to be cleared. Cadet assisting.
J. Blaikie (temporary). Waikawa <i>Fee and Contract Systems.</i>	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	226 3 9	From 19th January to 30th June. Broken forest country, with heavy rainfall.
J. Blaikie. Campbelltown	..	..	..	..	..	..	..	..	..	82	2	2-9/	11 16 8	1,700	8	8-47	60 0 0	40	3	7-4	14 16 0	..	..	..	..	..	74 16 0	74 16 0
W. Sharp. Otera and Waikawa	..	..	..	..	..	..	..	..	..	2,211	23	2-94/	214 15 10	..	..	..	..	..	19	1	10-79	10 5 0	9-75	15 0 0	146 5 0	..	158 1 8	Broken forest country, with heavy rainfall.
T. S. Miller. Invercargill, Campbelltown, Winton, Longwood, &c.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	278 17 10	Includes five settlement and eighteen saw-mill applications.
H. R. Dundas. Preservation	..	..	..	..	..	..	..	..	..	29	1	2-75/	4 0 0	..	..	..	..	..	29	3	42-03	58 17 6	..	..	..	..	62 17 6	Isolated claims on West Coast.
Means and totals	82,000	3	85 8 4	72,700	3	908 15 0	..	..	..	12,235	66	2-3/	929 14 1	1,700	8	8-47	60 0 0	88	7	20	83 18 6	53-91	17 1 6	921 4 3	..	65 15 10	2,268 14 2	

Approximate Cost of Paper.—Preparation, not given; printing (1,700 copies), £30.