

1928.
NEW ZEALAND.

DEPARTMENT OF LANDS AND SURVEY.
SURVEYS

(ANNUAL REPORT ON).

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

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The SURVEYOR-GENERAL to the Hon the MINISTER OF LANDS,

SIR,—

Wellington, 19th June, 1928.

I have the honour to present herewith the report on survey operations for the year ended 31st March, 1928.

I have, &c.,

W. T. NEILL,

Surveyor-General.

Hon. A. D. McLeod, Minister of Lands.

REPORT.

THE main parts of the report for the year ended the 31st March, 1928, comprise a summary of the operations of the field parties, grouped under appropriate headings, a brief account of the office-work performed, and extracts from the reports of the various Chief Surveyors.

The attached tables, A and B, and 1 to 5 inclusive, contain a concise summary of the amount of work completed during the year under review. Further details are given in the reports of the Chief Surveyors appended hereto.

The average costs as set out in Table A compare very favourably with previous years, the main classes of rural and Native Land Court Surveys each showing a decided decrease—of 5d. per acre—over the last year's costs, while road surveys and town surveys remain practically the same—at £30 per mile and £2 per section respectively.

An increase in the areas surveyed is shown in both Native-land surveys and rural surveys over last year's figures, the increases being 57,306 acres and 5,956 acres respectively.

TABLE A.

Class of Work.	Area, &c.	Average Cost.	Total Cost.
Minor triangulation, by staff	7,210 acres	3·03d. per acre	£ 91 0 0
Topographical (sketch), by staff	6,182 „	5·98d. „	149 18 2
Topographical (sketch), by private surveyors	3,205 „	7·81d. „	104 7 0
Topographical (contoured), by staff	213·5 sq. m.	£5·95 per sq. m.	1,270 7 1
Rural, by staff	95,951 acres	1·55s. per acre	7,432 15 0
Rural, by private surveyors	188 „	4·25s. „	40 0 0
Suburban, by staff	850·8 „	£1·24 „	1,055 2 2
Town, by staff	1,888 sections	£2·05 per section	3,870 3 5
Native Land Court, by staff	14,019 acres	1·24s. per acre	872 14 2
Native Land Court, by private surveyors	122,737 „	2·12s. „	12,983 11 11
Roads, by staff	162·9 miles	£30·68 per mile	4,997 18 8
Roads, by private surveyors	9·4 „	£20·69 „	194 9 5
Other work, by staff .. ..	..	..	7,515 6 0

TABLE B.

Land District.	Rural Survey.	Native Land Court.
	Acres.	Acres.
North Auckland	5,439	2,394
Auckland	37,494	79,365
Gisborne	8,660	23,972
Hawke's Bay	1,051	3,911
Taranaki	4,185	4,367
Wellington	7,973	22,211
Marlborough	1,329	..
Nelson	1,599	..
Westland	2,920	..
Canterbury	17,476	318
Otago	5,346	125
Southland	2,667	93
Totals	96,139	136,756

MINOR TRIANGULATION.

The only work returned under this heading is two small areas in Wellington and Otago Districts. A revision of this work will be required as the geodetic triangulation progresses, but this should not entail much field-work.

SETTLEMENT SURVEYS.

These comprise Crown lands and lands for settlement, and are shown in Table 2 under their appropriate headings for each land district. Details of the various areas are set out in the reports of the Chief Surveyors.

NATIVE LAND SURVEYS.

This year there has been a large increase (57,306 acres) on the area returned last year for this class. In accordance with the usual policy, only those blocks in which the Crown is directly interested have been done by the staff—about 10 per cent.—the balance being surveyed by private surveyors.

GEODETIC TRIANGULATION.

One party under Mr. H. M. Ross has been engaged on this work continuously during the year. Observations have been completed at six new stations and reconnaissance and signal-building carried out in the Wellington District. The average close per triangle is 1·40" to date. The adoption of longer rays up to 40 miles has resulted in a larger area being covered. Further details of this work will be published in Volume V of the *Records of the Survey of New Zealand*.

STANDARD SURVEYS.

Good progress has been made during the year, three parties being continuously employed and two parties partly employed on this work. The average accuracy as disclosed by closed circuits is under 0·1 link per mile, and the greatest discrepancy so disclosed is less than 0·2 per mile, so that the high standard set for these surveys is being fully maintained.

Mr. H. M. Kensington returned a distance of 23 miles as completed during the year in the vicinity of Auckland. Mr. A. C. Haase has continued with the New Plymouth standard, and this is now nearing completion. Mr. J. D. Clapperton returns 23 miles of rural standard survey on main highways completed during the year near Blenheim. Mr. H. A. Adams has completed 24½ miles of the 26 miles required to be done in and around Timaru. Mr. C. Otway has been engaged practically continuously on the Invercargill survey, which is now nearly completed.

The permanent surfacing of roads and streets has been the cause of considerable work in various districts, as the standard marks have to be made to accord with the new levels of the surface, and covers provided in order that they may be readily available for the surveyor. A report on each survey, when completed, is published in the *Records of the Survey of New Zealand*.

TOPOGRAPHICAL SURVEY.

The plane-table survey on 4-inches-to-1-mile scale is being continued at Rotorua, Ngaruawahia, and Taranaki, a total area of 213½ square miles having been completed in the field during the year. Details of these surveys are published in the "Records of the Survey of New Zealand."

FIELD INSPECTIONS.

About thirty field inspections have been made during the year by senior staff officers, and, while usually disclosing good work on the part of the surveyor, there has been in some few instances very poor work disclosed.

In some of the districts, owing to shortage of staff, the number of inspections made are insufficient. It is expected that more of this important duty will be undertaken during the coming year.

TIDAL SURVEY.

The work for the year under report comprised the completion of the analysis for the Port of Lyttelton for 1925, together with a complete fresh analysis for the Ports of New Plymouth (1921) and Dunedin (1926). The constants derived therefrom, combined with previous determined values are contained in Table C.

TABLE C.

Mean Values of the Harmonic Constants for Use in preparing Tide-tables.

Tide Symbol.	Auckland. A ₀ = 5.72 ft.		Bluff. A ₀ = 5.27 ft.		Dunedin. A ₀ = 3.23 ft.		Lyttelton. A ₀ = 3.20 ft.		New Plymouth. A ₀ = 5.50 ft.		Wellington. A ₀ = 2.93 ft.		Westport. A ₀ = 4.77 ft.	
	H.	K.	H.	K.	H.	K.	H.	K.	H.	K.	H.	K.	H.	K.
<i>Short Period</i>	Ft.	°	Ft.	°	Ft.	°	Ft.	°	Ft.	°	Ft.	°	Ft.	°
S1	0.011	31.74	0.010	100.05	0.014	62.55	0.025	24.75	0.011	90.77	0.002	354.03	0.011	78.04
S2	0.580	268.31	0.502	49.79	0.252	126.17	0.159	140.26	1.103	306.14	0.100	330.28	0.959	332.22
S4	0.019	331.83	0.009	223.42	0.006	315.34	0.009	189.50	0.008	352.33	0.004	215.90	0.007	32.75
S6	0.003	41.77	0.006	170.17	0.003	106.17	0.014	340.69	0.006	88.73	0.004	310.31	0.006	331.21
M1	0.009	144.71	0.011	127.33	0.008	37.80	0.010	50.45	0.008	71.92	0.006	22.11	0.012	143.08
M2	3.818	206.37	2.858	35.68	2.403	122.42	2.893	123.53	3.986	277.36	1.611	138.99	3.747	304.43
M3	0.039	199.21	0.011	272.74	0.014	282.83	0.013	154.24	0.030	151.30	0.019	175.72	0.021	208.15
M4	0.106	124.54	0.088	226.45	0.265	180.28	0.011	103.56	0.078	52.77	0.041	251.11	0.057	53.90
M6	0.026	314.33	0.086	79.53	0.059	0.23	0.019	65.15	0.023	262.35	0.012	98.61	0.026	36.82
O1	0.053	145.25	0.113	72.91	0.087	69.67	0.084	62.22	0.046	103.23	0.103	36.57	0.093	45.98
K1	0.235	169.17	0.058	115.68	0.076	95.22	0.159	84.89	0.205	186.06	0.082	84.49	0.073	184.39
K2	0.139	256.95	0.134	46.77	0.084	115.51	0.052	105.71	0.309	297.39	0.044	7.49	0.276	328.04
P1	0.077	163.91	0.023	105.44	0.022	93.75	0.048	100.50	0.063	179.23	0.032	77.13	0.022	133.91
J1	0.017	185.22	0.006	198.96	0.008	85.48	0.008	134.16	0.018	222.36	0.010	178.05	0.013	219.25
Q1	0.009	67.58	0.031	47.70	0.030	62.34	0.019	58.96	0.019	38.27	0.036	22.17	0.037	33.03
L2	0.108	219.79	0.109	32.44	0.160	122.62	0.076	155.20	0.122	278.28	0.029	156.82	0.097	285.41
N2	0.793	179.27	0.654	16.50	0.519	102.02	0.644	92.57	0.821	261.11	0.398	104.65	0.770	289.02
γ2	0.203	206.34	0.153	53.35	0.114	103.68	0.119	110.05	0.177	264.28	0.107	113.02	0.194	320.40
μ2	0.102	178.49	0.065	7.93	0.032	51.75	0.102	64.85	0.127	242.24	0.067	88.08	0.134	283.83
T2	0.057	294.82	0.020	89.11	0.018	239.27	0.027	229.70	0.078	316.01	0.031	280.97	0.053	9.08
MS4	0.173	195.31	0.081	2.78	0.104	142.23	0.104	117.86	0.095	258.14	0.035	133.28	0.105	294.78
(2SM) 2	0.066	303.10	0.045	121.63	0.040	19.29	0.063	27.15	0.088	222.36	0.033	356.74	0.076	199.89
R2	0.015	211.16	0.014	111.90	0.032	181.93	0.018	143.70	0.032	300.05	0.011	138.68	0.035	178.80
<i>Long Period</i>														
Mm	0.045	195.02	0.043	1.94	0.052	354.94	0.060	172.57	0.060	337.01	0.039	174.85	0.051	199.18
Mf	0.050	206.01	0.067	235.36	0.095	264.77	0.074	207.51	0.026	365.26	0.060	232.19	0.055	7.87
MSf	0.035	209.57	0.063	326.77	0.056	43.62	0.100	132.64	0.081	190.54	0.043	106.30	0.069	98.39
Sa	0.186	30.61	0.089	16.98	0.112	240.70	0.123	348.92	0.077	86.54	0.108	332.12	0.113	81.51
Ssa	0.071	164.94	0.115	82.05	0.096	202.78	0.103	161.90	0.084	43.84	0.073	111.04	0.116	111.03

The tide-tables for the year 1929 for the seven New Zealand ports (Auckland, New Plymouth, Wellington, Lyttelton, Dunedin, Bluff, and Westport) for which tidal predictions are published were received in Wellington on the 4th July, 1927, from the Hydrographer to the Admiralty.

The work of measuring the times and heights of high and low water was again performed at the Tidal Institute, University of Liverpool, England.

In addition to the above, work in hand includes comparisons between the predicted times and heights of high and low water for the year 1927 at the following ports—Auckland, Wellington, Lyttelton, Dunedin, Bluff, and Westport—and the actual times and heights of high and low water as recorded by self-registering tide-gauges. Details of these comparisons will be published in the *Records of the Survey of New Zealand*. These comparisons show that the predictions published in the Tide-tables are very satisfactory both as regards the time and height of high and low water, and that the mean harmonic constants, on which the predictions depend, are becoming more accurate as each additional analysis is included.

MAGNETIC OBSERVATORY.

During the year the Eschenhagen magnetographs at Amberley and the Adie magnetographs at Christchurch have been kept in operation, and from the hourly measurements of the magnetograms the mean annual values of the magnetic elements are as follows:—

	Mean Value 1927.	Change since 1926.	Change from 1925-26.
Magnetic declination (east)	17° 31'·3	+ 5'·3	+ 5'·0
Magnetic horizontal force	0·22135	— 6 γ	—25 γ
Magnetic inclination (south)	—68° 16'·2	— 0'·6	— 1'·4
Northerly component	+0·21108	—16 γ	—34 γ
Easterly component	+0·06664	+31 γ	+23 γ
Vertical component	—0·55538	—13 γ	+ 3 γ
Total magnetic force	+0·59787	+10 γ	— 6 γ

Some interest attaches to the acceleration of the rate of secular change in magnetic declination, which has apparently almost uniformly accelerated at the rate of 0'·3 per annum lately. From 1924 to 1925 the annual change was 4'·7; from 1925 to 1926 it was 5'·0; from 1926 to 1927 it was 5'·3. A similar acceleration occurred from 1902 to 1904, from 1914 to 1916, and from 1917 to 1919, but, as none of these latter accelerations persisted, it is unlikely that the present acceleration will continue.

The small annual change horizontal magnetic force (—6 γ) is only paralleled by the —8 γ experienced from 1922 to 1923.

As usual the hourly values, and the vector and other diagrams of the diurnal variations and the coefficients of the first four terms in Fourier series for the average seasonal and the annual diurnal variations are being published in the *Records of the Survey of New Zealand*.

Milne seismograph No. 16 has been kept in operation, and the seismograms have been measured for publication in the *Records*.

The mean annual values of the magnetic elements, as far as they are available, are shown in Table D below.

In addition to the usual meteorological observations (thrice daily on most days) which are locally published in the papers, pilot-balloon observations have been made as circumstances permitted. A second balloon theodolite has been procured by the New Zealand Institute to permit (a) simultaneous observation of one balloon from the ends of a measured base; (b) simultaneous observation of two balloons at two different locations. (a) serves to determine vertical currents, (b) serves to determine the variation of horizontal currents, between the stations. The cost of this work is being defrayed out of a research grant.

TABLE D.

Mean Annual Values of the Magnetic Elements at Christchurch Observatory.

Date.	Declination E. of N.	Annual Change.	Horizontal Force.	Annual Change.	Vertical Force.	Annual Change.	Inclination South.	Annual Change.	Hourly Values published in Annual Reports
1902 ..	16 15.1		C.G.S. Unit. 0.22694	γ -25	C.G.S. Unit. 0.55277	γ + 9	67 40.80	+1.50	1912-13
1903 ..	16 18.3	+3.2	0.22669	-25	0.55286	+21	67 42.30	+1.80	1912-13
1904 ..	16 21.8	+3.5 +3.6	0.22644	-16	0.55307	+41	67 44.10	+1.70	1912-13
1905 ..	16 25.4	+3.5	0.22628	-29	0.55348	+28	67 45.80	+1.80	1919-20
1906 ..	16 28.9	+2.2	0.22599	-21	..	..	..	..	†Vol. IV.
1907 ..	16 31.1	+2.2	..	..	..	..	..	..	..
1908 ..	..	..	..	..	..	..	..	..	..
1909 ..	..	..	..	..	..	..	..	..	..
1910 ..	16 37.6	+1.4	0.22515	-27	0.55485	+12	67 54.80	+1.40	1920-21
1911 ..	16 39.0	+2.5	0.22494	-23	0.55497	- 9	67 56.20	+1.00	..
1912 ..	..	..	..	..	..	..	..	..	..
1913 ..	16 44.0	+0.8	0.22449	-35	0.55478	-13	67 58.20	+1.60	1913-14
1914 ..	16 44.8	+2.2	0.22414	-27	0.55465	+ 7	67 59.80	+1.67	1914-15
1915 ..	16 47.0	+2.8	0.22387	-32	..	..	..	..	*Sept., 1918
1916 ..	16 49.8	+3.2	0.22355	-27	..	..	..	..	*Sept., 1918
1917 ..	16 53.0	+2.7	0.22328	-24	0.55486	+30	68 04.80	+1.90	*Mar., 1921
1918 ..	16 55.7	+2.9	0.22304	-24	0.55516	- 9	68 06.70	+1.10	1918-19
1919 ..	16 58.6	+3.1	0.22280	-19	0.55507	+18	68 07.80	+1.40	1919-20
1920 ..	17 01.7	+2.9	0.22261	-20	0.55525	+03	68 09.20	+1.10	†1920-21
1921 ..	17 04.6	+3.7	0.22241	-24	0.55528	-21	68 10.30	+0.90	†1921-22
1922 ..	17 08.3	+3.4	0.22217	-08	0.55507	+19	68 11.20	+0.80	†1922-23
1923 ..	17 11.7	+4.7	0.22209	-21	0.55526	-18	68 12.00	+0.73	‡Vol. I.
1924 ..	17 16.4	+4.7	0.22188	-22	0.55508	-14	68 12.73	+1.47	‡Vol. II.
1925 ..	17 21.1	+4.9	0.22166	-25	0.55522	+ 3	68 14.20	+1.40	‡Vol. III.
1926 ..	17 26.0	+5.3	0.22141	-06	0.55525	+13	68 15.60	+0.60	‡Vol. IV.
1927 ..	17 31.3		0.22135		0.55538		68 16.20		

* Mean hourly values published in *New Zealand Journal of Science and Technology*.
 † Records of the Survey of New Zealand.

‡ Special publication.

HONORARY GEOGRAPHIC BOARD.

(Provisionally constituted, 1924.)

The fourth annual meeting of the Geographic Board, convened by the Surveyor-General, was held in the Parliament Buildings on the 9th March, 1928, at 10 a.m.

The following members were present: Sir F. R. Chapman (presiding), the Ven. Archdeacon Herbert Williams, Messrs. W. T. Neill, Elsdon Best, J. C. Andersen, and M. Crompton Smith.

Recommendations from the Recess Committee and business arising during the past year was transacted.

Confirmation of Committee's Recommendations.—Mount Ruapehu: It was resolved that the highest peak on Mount Ruapehu and the mountain-mass as a whole be called "Mount Ruapehu."

Retention of Names.—Suggestions were submitted by the Railway Board and others regarding the change of name of certain places. It was resolved that the following names be retained: "Waikaia" instead of "Switzers" for the name of a post and telegraph office at Waikaia; "Mahuta" instead of "Ralphville" for name of railway-station near Huntly; "Raoul Island" for an island known as "Sunday Island" in the Kermadecs; "Whitianga Bay" instead of "Mercury Bay" for name of post-office at Mercury Bay; "Otago Central" instead of "Central Otago"; "Kiwiniui" instead of "Whakatane Junction"; "Te Ika-a-Maru Bay" instead of "Kaminaru Bay."

Orthography.—Place-names of Rotorua, of doubtful spelling, in connection with a topographical survey of Rotorua, were submitted, and the spelling of the following names was considered correct: "Hauparu" instead of "Hau Paru"; "Rotoatua" instead of "Roto-atua"; "Nga Puketurua" instead of "Ngapuke-Turua"; "Nga Tamawahine" instead of "Ngatamawahine"; "Orangikahui" instead of "Orangi Kahui"; "Te Puapua" instead of "Te Pua Pua."

The Maori name of "Te Puna-a-Tuhoe" to be used instead of "Fairy Spring."

Miscellaneous Names.—"Omaui" in lieu of "Omawai"; "Waiholā," with "Waihora" in parenthesis, in lieu of "Waihola"; "Maniatoto" in lieu of "Maniototo"; "Whaingaroa" in lieu of "Whangaroa"; "Mangaroa" in lieu of "Mungaroa" or "Maungaroa" for a tributary of the Hutt River, trig., railway-station, and post-office; "Catchpool" in lieu of "Catchpole" for a stream in the Wainui-o-Mata district.

Change of Names.—It was resolved that the undermentioned names be changed, viz.: "Whenuakura" to "Rangikura" for a railway-station in the Taranaki District; "Revell's Camp Domain" to "Revell Camp Domain"; "Old Custom House Street," City of Wellington, to "Bond Street."

New Names.—The following names were recommended for adoption, viz.: "Punganui" for the name of a railway-station near Helensville; "Akatea Street" for a proposed new street off Adelaide Road, City of Wellington; "Gowanbridge" for a new railway-station on the Kawatiri-Gowan line, Nelson District.

Triplication of Name.—Mount Cerberus: The Board considered the reports obtained from the Chief Surveyors of Otago, Southland, and Wellington with reference to the name of "Mount Cerberus" being given to a peak in their respective districts, and resolved that they saw no reason to recommend any alteration to the name of Mount Cerberus in the localities mentioned.

Further particulars and fuller reports will appear in the *Records of the Survey of New Zealand*.

PROPOSED OPERATIONS FOR 1928-29.

Geodetic Triangulation.—It is proposed to extend the triangulation to the shores of Cook Strait, and to select suitable stations on the South Island for a connection therewith. A datum or initial station for the Dominion will be chosen and the necessary astronomical observations undertaken for its precise location.

Minor Triangulation.—No new work is contemplated, but it may possibly be necessary to undertake small areas to control settlement surveys being done during the year.

Topographical Surveys.—The contoured plane-table surveys are to be continued in the Rotorua and Taranaki Districts, while the small survey at Ngaruawahia will be completed shortly.

Exploratory and Geographical Surveys.—It is expected that a further exploratory survey in the Fiords District will be undertaken during next summer, continuing the work done by Mr. T. W. Preston in the 1927-28 season.

Standard Surveys.—The survey of the suburban boroughs around the City of Auckland will be continued during the year. New Plymouth, Timaru, and Invercargill are expected to be completed. Rural standards in Taranaki, Marlborough, and Canterbury will be gone on with. Negotiations with several local bodies are in progress, and it is expected that work in connection with these will be commenced early. A start with a small survey of part of Port Chalmers Borough is being made shortly, and it is expected to complete it during the year.

Town-section Surveys.—The subdivision of the Orakei Garden Suburb and of the Lower Hutt Valley Settlement are being continued, and further areas in each will be available for disposal during the year. Small areas in various districts are also to be cut up into town lots.

Rural Settlement.—In this class there are about 82,000 acres of Crown lands available for survey during the year, and it may be expected that the greater part of this will be surveyed ready for disposal within the year.

Native Land Court Surveys.—Authorities for the survey of nearly 60,000 acres are already issued, chiefly to private surveyors.

Miscellaneous.—In addition to the above-mentioned works there are the customary examination and recording of plans, field inspections, compilation of maps for publication, and computations in connection with tidal, magnetic, and geodetic surveys.

GENERAL.

Map-publication.—The total publications under this heading were 95, and the cost of printing £1,780.

Cash sales of litho maps from all districts were well maintained, and amounted to £1,375, a falling-off of £75 on the previous year, but well above the average.

Government Departments were supplied with maps to the value of £1,370, of which about 30 per cent. is due to the alteration of electoral boundaries as fixed by the last sitting of the Representation Commission.

Fuller particulars of the items under this heading are contained in the report by the Chief Draughtsman appended hereto.

With the present staff, and owing to the ever-increasing volume of work to be dealt with in the Land Transfer Branch, slow progress is being made in bringing the county and district maps up to date.

There are about 500 maps which require to be revised and redrawn, and it is proposed to concentrate on this work as far as possible.

Town Subdivisional Schemes.—The town schemes approved during the year numbered 298, a falling-off from last year's figures of eighteen. The North Auckland District contributes 54 per cent.; Canterbury, 20 per cent.; Wellington, 9 per cent.; and Auckland, 5 per cent.

The town schemes included a total area of 2,541 acres; and of this area new streets account for 209 acres; road and access reserves, 23 acres; reserve for public purposes, 118 acres; and lots available for sale, 2,191 acres.

Proclamation of Roads, &c.—During the past year a number of applications for the proclamation of road-lines laid out by the Native Land Court under sections 48, 49, 50, and 52 of the Native Land Amendment Act, 1913, were considered and dealt with. The statutory notices under section 15 of the Native Land Amendment Act, 1914, were forwarded to the local authorities of the districts concerned, and in the majority of cases no objections were raised to the proclamation of the road-lines as public highways.

Under the Land for Settlements Act, 1925 (section 106), two warrants were issued closing unformed and unused roads intersecting or adjoining land acquired under the Act, in order that the areas comprised therein could be incorporated in the allotments available for disposal.

Under the Land Transfer Act 252 warrants for the issue of certificates of title were examined and certified to in terms of section 13 of the Act. A number of applications to bring land under the Land Transfer Act were also considered and approved in pursuance of section 19 of the Act.

Desiderata.—(1) There is a pressing need for a suitable site to erect and house the comparator and standard bar and the magnetic instruments at present operating at Christchurch and Amberley in a locality free from disturbing influences.

(2) A repeat survey of the magnetic elements in the vicinity of the principal seaports is becoming an urgent matter.

(3) The importance of making observations for the determination of the values of gravity in connection with the geodetic survey has been advocated in previous reports.

This work, in several countries, is receiving special attention on account of its practical value in locating oil and other mineral deposits.

International Geodetic and Geophysical Union.—The Department became a member of the union in August last, and was represented at the Prague meeting by Col. Winterbotham, of the Geographical Section, War Office, and Dr. A. Thomson, of the Apia Observatory, Samoa. Further particulars of the decisions and recommendations of the Congress will be published in the *Records*.

Wireless Longitude Determination.—The Department co-operated with the Government Astronomer in a scheme for the wireless determination of the observatory by providing a 12 in. theodolite and detailing the services of Mr. T. W. Preston, surveyor, for one month from 20th September to make determinations of time. The observations were reduced by Mr. Preston and checked at this office by Mr. Williams.

STAFF.

Retirements.—Mr. A. H. Vickerman, Chief Draughtsman, North Auckland, retired on the 31st May, 1927, after forty-eight years of faithful service. He joined the Department as a survey cadet in 1879, and after passing his examination as a surveyor was appointed to the Auckland District in 1883. He was subsequently detailed for field duty, and in 1901 was appointed to the Roads Department. In 1910 he was retransferred to the Lands Department as a District Surveyor, and in 1917 was promoted Chief Draughtsman, Invercargill, this being followed by further promotion to the position of Chief Draughtsman, North Auckland, in November, 1920. Mr. Vickerman frequently acted as Deputy Chief Surveyor and Commissioner of Crown Lands, and throughout his long term of service was held in high esteem as an efficient and conscientious officer.

Deaths.—Mr. S. Parkinson, draughtsman and computer, Wellington, died on the 15th June, 1927, after an extended illness. He qualified as a surveyor in 1909, and joined the Department in the following year as computer and draughtsman on the temporary staff in Auckland. In 1913 he was transferred to Nelson as a surveyor, and in November, 1915, he joined the Expeditionary Force, being then appointed to the permanent staff. He received his discharge in April, 1919, and took up work as a surveyor in the Wellington District. His war service, however, had undermined his health, and he found it necessary to give up field work for an office position.

Mr. A. H. L. Hay was appointed to the Department in 1908 as a cadet in the Invercargill office. He was transferred to the field staff in 1911, qualified as a surveyor in 1915, and transferred to Otago. Towards the end of 1918 his health broke down, but he continued to carry out field duty as long as possible, until he was finally compelled to apply for extended leave. Subsequently, in 1926, he was given office-work as a draughtsman in the Napier office, where he remained until his death, in August, 1927. Mr. Hay was an excellent officer, and his death at an early age is sincerely regretted.

Resignations.—Messrs. A. J. Dry and J. D. L. McLean, draughtsmen, resigned in January, 1928, to take up positions under the Western Australian Government.

Appreciation.—In conclusion, I am pleased to bring under your notice and to place on record the appreciation by the various Chief Surveyors of the manner in which their officers have carried out their duties during the year, and I desire to convey my thanks to the whole of the Survey staff for their good work.

W. T. NEILL, Surveyor-General.

Table 1.—RETURN OF FIELD-WORK EXECUTED BY HEAD OFFICE STAFF FROM 1ST APRIL, 1927, TO 31ST MARCH, 1928.

District.	Standard Surveys.				Geodetic Triangulation.				Other Work. Cost.				
	Completed.		In Progress.		Completed.		In Progress.						
	Miles.	Cost.	Miles.	Cost.	Square Miles.	Cost.	Square Miles.	Cost.					
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
Auckland ..													
Gisborne ..													
Hawke's Bay ..							27,000	8,127	4	0			
Wellington ..													
North Auckland ..	23.0	1,021	2	8	25	211	7	0			651	11	4
Taranaki ..					60	5,625	12	1					
Southland ..					60	5,985	13	3					

Table 2.—RETURN OF FIELD-WORK EXECUTED BY THE STAFF AND CONTRACT SURVEYORS ON LANDS ADMINISTERED BY LANDS AND SURVEY DEPARTMENT, FROM 1ST APRIL, 1927, TO 31ST MARCH, 1928.

District.	Minor Triangulations.			Contoured Topographical Survey. 1-1928.			Topographical Survey for Selection as Unsurveyed Land.			Rural.		
	Acres.	Cost per Acre.	Total Cost.	Sq. Miles.	Cost per Mile.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.
North Auckland	5,439	4-66	1,267 4 11
Auckland	98-5	8-06	794 16 3	..	..	..	37,494	0-73	1,366 19 7
Gisborne	8,660	0-74	319 1 8
Hawke's Bay	5,760	3-10	74 16 0	1,051	2-20	116 7 10
Taranaki	115-0	4-13	475 10 10	..	..	..	4,185	3-61	736 0 11
Wellington	272	61-52	69 14 8	7,973	1-84	733 16 9
Marlborough	150	8-60	5 7 6	1,329	0-99	66 5 0
Nelson	1,599	3-83	306 9 5
Westland	2,920	5-14	750 2 6
Canterbury	17,476	0-35	310 3 7
Otago	5,346	3-38	905 6 10
Southland	2,667	4-31	574 16 0
Totals	213-5	5-95	1,270 7 1	6,182	5-82	149 18 2	96,139	1-55	7,472 15 0

District.	Village and Suburban.			Town Section Survey.			Roads, Railways, and Water-races.			Other Work.		
	Acres.	No. of Sections.	Total Cost.	Acres.	No. of Sections.	Total Cost.	Miles.	Cost per Mile.	Total Cost.	Acres.	Cost.	Total Cost of completed Work.
North Auckland ..	44-2	3	£ 28 12 0	216-0	582	£ 719 9 2	11-3	23-54	£ 265 19 9	..	..	£ 4,694 2 9
Auckland ..	262-3	24	268 14 2	204-4	221	961 4 6	37-9	19-11	723 17 9	..	..	5,225 1 7
Gisborne ..	..	..	..	64-0	5	40 0 0	0-8	25-80	20 0 0	..	..	424 1 8
Hawke's Bay ..	58-0	4	70 13 0	8-0	45	101 10 0	..	..	..	..	..	567 12 10
Taranaki ..	..	..	..	159-0	622	776 7 7	2-1	19-92	41 17 0	..	..	1,951 6 2
Wellington ..	119-5	7	129 13 2	..	..	..	5-9	39-28	233 6 10	..	..	2,820 9 9
Marlborough ..	131-0	32	97 19 0	..	..	..	36-0	21-04	757 12 10	..	..	958 14 4
Nelson ..	50-2	49	190 5 5	24-2	194	57-2 15 0	3-7	38-57	141 16 0	..	..	1,348 5 1
Westland ..	36-0	5	65 9 10	17-0	40	113 10 0	27-3	49-65	1,353 0 5	..	..	3,054 19 3
Canterbury ..	..	..	..	8-3	40	43 0 0	13-4	18-70	251 0 0	..	..	775 6 3
Otago ..	..	..	..	190-1	37	353 12 7	1-8	57-23	103 0 6	..	..	1,627 1 1
Southland ..	116-2	33	110 5 4	24-7	89	84 0 1	1-7	19-53	33 15 7	..	..	1,679 18 2
Totals ..	817-4	157	961 11 11	915-7	1,875	3,765 8 11	141-9	27-66	3,925 6 8	7,490 11 2	..	25,126 18 11

Table 3.—RETURN OF FIELD-WORK EXECUTED BY THE STAFF AND CONTRACT SURVEYORS ON LANDS ADMINISTERED BY OTHER DEPARTMENTS, FROM 1ST APRIL, 1927, TO 31ST MARCH, 1928.

District.	Topographical Survey for Selection as Unsurveyed Land.			Village and Suburban.				Town Section Survey.			
	Acres.	Cost per Acre.	Total Cost.	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Acres.	No. of Sections.	Cost of Sections.	Total Cost.
North Auckland	3,205	d. 0-65	£ 104 s. 7 d. 0	26-4	8	s. 50-41	£ 71 s. 10 d. 3	8-9	6	£ 10-43	£ 62 s. 11 d. 6
Auckland	7-0	2	62-85	22 0 0	0-9	3	6-00	18 0 0
Gisborne
Hawke's Bay
Taranaki
Wellington
Marlborough
Nelson
Westland
Canterbury	0-9	4	6-04	24 3 0
Otago
Southland
Totals ..	3,205	0-65	104 7 0	33-4	10	55-99	93 10 3	10-7	13	8-05	104 14 6

District.	Native Land Survey.				Roads, Railways and Water-races.			Other Work.		Total Cost of completed Work.
	Acres.	No. of Sections or Divisions.	Cost per Acre.	Total Cost.	Miles.	Cost per Mile.	Total Cost.	Cost.		
North Auckland	2,394	68	s. 4-30	£ 515 s. 10 d. 0	5-5	£ 38-80	£ 213 s. 4 d. 4	£ 24 s. 14 d. 10	£ 991 s. 17 d. 11	
Auckland ..	79,365	339	1-70	6,763 8 11	16-8	26-04	437 10 4	..	7,240 19 3	
Gisborne ..	23,972	179	2-02	2,424 8 2	..	..	..	..	2,424 8 2
Hawke's Bay ..	3,911	56	2-10	403 0 0	..	..	..	..	403 0 0
Taranaki ..	4,367	44	2-30	507 6 1	..	..	..	..	507 6 1
Wellington ..	22,211	200	2-73	3,032 12 3	5-0	95-92	479 11 10	..	3,512 4 1	
Marlborough ..	..	..	..	..	..	..	..	..	..
Nelson ..	..	..	..	..	..	..	..	..	..
Westland ..	..	..	..	..	3-1	44-10	136 14 11	..	136 14 11
Canterbury ..	318	14	5-04	80 2 0	..	..	..	..	104 5 0
Otago ..	125	12	8-48	53 0 0	..	..	..	..	53 0 0
Southland ..	93	3	16-65	76 18 8	..	..	..	..	76 18 8
Totals ..	136,756	915	2-02	13,856 6 1	30-4	41-68	1,267 1 5	24 14 10	15,450 14 1	

Table 4.—RETURN SHOWING SURVEYORS EMPLOYED AND WORK ON HAND ON 1ST APRIL, 1928.

Chief Surveyors.	Surveyors employed.		District.	Work on Hand.					
	Staff.	Contract.		Topo-graphical.	Settlement.	Native.	Roads.	Towns	Standard Traverse.
O. N. Campbell ..	5	..	North Auckland	Sq. Miles.	Acres.	Acres.	Miles.	Acres.	Miles.
K. M. Graham ..	7	14	Auckland ..	..	17,631	..	17-2	300	..
E. H. Farnie ..	2	..	Gisborne ..	609	17,547	11,995	117-8	..	..
J. D. Thomson ..	1	3	Hawke's Bay ..	..	..	41,694	6-0	5	..
W. D. Armit ..	2	3	Taranaki ..	1,000	10,780	345	7-8	..	..
F. H. Waters ..	4	9	Wellington ..	..	2,190	4,090	0-3	22	..
J. Stevenson ..	1	..	Marlborough ..	..	10	580	10-0	..	55
A. F. Waters ..	1	..	Nelson ..	..	12,100	..	2-0	82	..
W. T. Morpeth ..	2	..	Westland ..	..	60	..	..	..	..
W. Stewart ..	2	..	Canterbury ..	..	8,783	71	65-0	28	30
R. S. Galbraith ..	2	..	Otago ..	..	13,208	..	8-2	1	8
N. C. Kensington ..	2	..	Southland ..	..	51	..	..	..	60
Totals ..	31	29	..	1,609	82,360	59,237	234-3	438	203

Table 5.—PRINCIPAL CLASSES OF OFFICE-WORK DONE FROM 1ST APRIL, 1927, TO 31ST MARCH, 1928.

District.	Plans placed on Instruments of Title.				Deeds and other Instruments passed.	Plans examined and passed.				Maps drawn for Lithography.		Lithographs, &c., sold.
	Crown.		Native Land.	Land Transfer.		Crown.	Native.	Land Transfer.	Other Departments.	Standard Publications.	Sale Plans, &c.	
	Leases, Licences.	Freehold.										
North Auckland ..	450	382	213	10,202	5,677	81	30	820	132	3	89	£ s. d. 279 11 3
Auckland ..	510	300	1,044	2,233	1,501	92	125	224	70	2	107	111 8 10
Gisborne ..	39	..	817	630	..	7	49	65	24	..	4	19 10 6
Hawke's Bay ..	103	34	284	4,422	2,427	26	26	133	43	..	15	51 7 6
Taranaki ..	386	76	134	2,130	2,596	20	40	92	21	5	10	72 18 6
Wellington ..	1,174	872	904	10,312	3,052	64	34	522	137	1	50	43 14 6
Marlborough ..	38	36	6	1,138	521	11	..	41	39	..	..	28 7 7
Nelson ..	252	38	..	721	1,011	34	..	103	13	5	19	39 0 3
Westland ..	352	..	..	456	11	51	..	21	8	..	1	36 14 6
Canterbury ..	276	110	72	7,448	3,142	29	12	479	26	2	2	137 18 11
Otago ..	571	158	102	3,636	513	80	3	115	23	9	11	164 4 10
Southland ..	105	36	6	2,288	1,306	30	1	72	14	3	9	76 19 6
Head Office ..	..	..	..	..	..	..	..	..	..	8	32	526 8 5
Totals ..	4,256	2,042	3,582	45,616	21,757	525	320	2,687	550	38	349	1,578 5 1

APPENDIX I.

HEAD OFFICE, DRAUGHTING BRANCH.

REPORT by H. E. WALSH, CHIEF DRAUGHTSMAN.

Map-publication.—The total maps published during the year were 95, and the cost for printing £1,780. The maps comprised survey districts ($\frac{1}{2}$ mile to 1 in.), 14; survey districts (1 mile to 1 in.), 44; counties (1 mile to 1 in.), 7; towns (8 chains to 10 chains to 1 in.), 15; territorial (4 miles to 1 in.), 4; small-scale general maps, 6; and miscellaneous, 5. The number of copies per edition has in a number of cases been increased to allow of a longer time elapsing between reprints.

Cash sales of litho maps from all districts amounted to £1,375, which, while a decrease of £75 on the previous year, is well above the average for a normal year.

Other Government Departments were supplied with maps to the value of £1,370, of which about one-third is due to the alteration in electoral boundaries consequent on the sitting of the Representation Commission.

Four sheets of the 4-miles series territorial maps were published during the year, five more are in proof stage, and the drawing of four others partly completed.

Town Schemes.—The town schemes approved during the year again show a slight falling-off, the number this year being 298, against 316 last year. The North Auckland District again contributes more than half the total, 54 per cent. being from that district, whilst Canterbury (20 per cent.), Wellington (9 per cent.), and Auckland (5 per cent.), are responsible for the bulk of the remainder. An analysis of the schemes shows that 2,541 acres were subdivided into residential lots outside of boroughs and town districts; and of this area new roads account for 209 acres, road and access reserves, 23 acres; recreation and other public reserves, 118 acres; and lots available for sale, 2,191 acres.

Draughtsmen's and Computers' Examination.—The annual examination was held in December, 1927, thirty-six candidates presenting themselves for examination. The results were as follows: Draughting: First grade—four candidates, all of whom failed; second grade—seventeen candidates, of whom nine passed (Messrs. G. C. Wilson, J. D. McLean, E. W. Harkness, W. G. Pratt, L. Harding, E. Pfankuch, W. H. Steel, W. E. Lynch, and T. P. Mahony). Computing: First grade—one candidate, who failed; second grade—fourteen candidates, of whom six passed (Messrs. E. N. Allan, T. J. Lowndes, C. B. Robson, T. E. Brown, S. V. Meyer, and G. F. N. Stewart).

The outside examiners appointed for the purpose of examining the subject "Photo-litho plans" were Messrs. M. Crompton Smith and G. N. Sturtevant.

Standard of Length.—During the year 29 bands were compared with the standard, the total length being 161½ chains. Of these, 5 were 1-chain steel standards, 2 were 1-chain invar standards, 20 were steel working-bands (of a length of 148 chains), 1 invar 5-chains working-band, and a 100 ft. steel pocket-tape.

The Imperial standard bands in custody of the various Chief Surveyors have been reported as being in good order during the year.

Natural Sines and Cosines.—A table of natural sines and cosines to 7 places and to each 10" of arc was published during the year. The volume consists of 100 pages foolscap-folio, and is bound in full green cloth, copies being placed for sale in each district office at £1 2s. 6d. each. The tables received a very thorough check, first by comparison with similar tables, and finally by the method of differences, using a calculating-machine. In consequence they may be used with complete confidence in their accuracy.

APPENDIX II.

EXTRACTS FROM THE ANNUAL REPORTS OF CHIEF SURVEYORS, 1927-28.

NORTH AUCKLAND LAND DISTRICT.

(O. N. CAMPBELL, Chief Surveyor.)

Rural.—During the year 5,251 acres of rural land were surveyed by staff surveyors, and 188 acres by a private surveyor.

Topographical.—3,205 acres of Native land were covered by topographical survey by private surveyors for the information of the Native Land Court.

Town-section Surveys.—Staff surveyors subdivided an area of 216 acres into 582 town sections.

Village and Suburban.—An area of 70 acres was surveyed by staff surveyors in this section.

Roads.—Staff surveyors completed 7 miles of road surveys, and 9 miles were carried out by private surveyors.

Native.—The work in this section was carried out by private surveyors, 2,394 acres being the total for the year.

Other Work.—This work included inspections of Land Transfer surveys, investigation surveys, reports and schemes of subdivisions, subdivision of gum-washing areas, surveys for Police Department, fixing standard blocks, &c. The survey of 274 sections in the Orakei Garden Suburb has been completed by Mr. Traill, and final plans prepared. A further 200 sections have been definitely planned, and, as the road-construction is nearing completion, these will be pegged in the near future. The planning of the remaining portion of the area is well advanced. Mr. Roe has been engaged on the survey of the Tangowahine Settlement, which covers an area of 4,666 acres, the work being now almost completed.

Office-work.—Plans received during the year totalled 255, and plans examined and approved 243; 154 scheme plans were dealt with; 55 plans were compiled in the office; 3 survey-district maps and 3 town-district maps were drawn for photo-lithographic reproduction, and 3 county maps were revised; 71 block-sheets were drawn; 89 sale plans were drawn; 874 tracings prepared; 382 certificates of title and 450 leases were endorsed; 212 Proclamations were entered; 1,103 plans were recorded. The usual general work—mounting and colouring lithos, sun-prints, recording Land Board transactions and *Gazette* notices, searching, correspondence, reports, and general office-work—has been carried out.

In connection with the past year's operations in lithographic production it may be mentioned that the work has now reached the more closely subdivided areas of the land district. Consequently progress will necessarily be slower than that obtaining when the more sparsely settled areas of the north were being dealt with.

Standard Surveys.—The office-work in connection with standard surveys has been carried out by the Survey Branch staff, and included 15 standard sheets drawn, additions made to 35, 40 examined; 44 tracings made, 78 examined, 27 traverse sheets copied and compared; general work, field data, &c.

Native Land Branch.—28 survey plans have been received during the year, 30 examined and approved, 13 compiled plans received, and 18 examined and approved; 66 schedules of cost have been checked, 2 caveats lodged, 2 Native Land Courts attended; 213 Court orders endorsed; 4 record maps have been drawn, 21 tracings and 13 compilations made; and the usual general office-work—searching, correspondence, &c.—has been carried out.

Land Transfer Branch.—696 plans have been received during the year, and 820 examined and approved.

Proposed Operations for 1928.—Mr. Traill will again be engaged on the survey of Orakei Garden Suburb. The remaining staff surveyors have authority to survey 17,631 acres of rural land, 10 miles of railway, 7 miles of road, and 24 square miles of triangulation work. Private surveyors have been authorized to survey 3,194 acres of Native land.

General.—Three officers have resigned during the year, two have been transferred to other districts, and one to the clerical staff. Two cadets have been appointed, and one officer transferred from Nelson. The staff now numbers forty.

In conclusion, I wish to thank the officers of the Department for the able assistance they have given me in carrying out the work of the Department during the year.

AUCKLAND LAND DISTRICT (K. M. GRAHAM, Chief Surveyor).

Topographical Survey.—For the past year one surveyor and one assistant surveyor have been engaged on this class of survey. The assistant surveyor has been employed wholly in the Rotorua District, and has completed 59 square miles during the year at a cost of £456 18s. 3d., an average cost of £7 7s. per square mile. The total area surveyed in the Rotorua County is now 619 square miles, costing £4,177 1s. 3d. The surveyor has continued the topographical survey of Ngaruawahia, and has completed during the year 39.52 square miles at a cost of £337 18s., an average cost of £8.55 per square mile. The total area surveyed to date is 109 square miles, costing £924 18s. 9d. It is anticipated that this survey will be completed early in 1928, when the surveyor will continue with the topographical survey of Rotorua.

Rural Surveys.—An area of 37,501 acres was completed by staff surveyors at a cost of £1,388 19s. 7d., or an average cost of 8·8d. per acre. This included an area of 26,990 acres of Crown land surveyed for State afforestation purposes.

Village and Suburban.—An area of 262 acres was subdivided during the year, comprising 24 sections scattered in different parts of the district, at a cost of £268 14s. 2d., being an average cost of £1 0s. 6d. per section.

Town-section Surveys.—There were 221 town sections surveyed, including redefinition of absentee sections in Pirongia. This comprised an area of 204 acres, at a cost of £961 4s. 6d., being an average cost of £4 14s. 2d. per acre.

Native-land Surveys.—An area of 75,528 acres was surveyed, comprising 333 subdivisions. With the exception of three surveys, containing 3,826 acres, carried out by staff surveyors, the above surveys were carried out by contract surveyors at schedule rates. The total cost was £6,663 8s. 11d., being an average cost of 1s. 9·2d. per acre.

Roads.—A total length of 55 miles of roads was surveyed during the year at a cost of £1,161 8s. 1d., being at a rate of £21·1 per mile. Seventeen miles of this work were deviations carried out for the Public Works Department, and 11 miles in connection with the Hauraki Plains for the Drainage Branch.

Other Work.—A large proportion of this comprises miscellaneous surveys and engineering-work on the Hauraki Plains for the Land Drainage Branch, costing £502 18s. 4d. The balance comprises various inspections, reports, and varied surveys that were necessary. The whole cost of other work was £1,109 9s. 4d.

Lake Taupo Fisheries Reserves Surveys.—This survey, carried out for the Internal Affairs Department, was continued during the year, and is now nearing completion. The main work has been the traversing of rivers that flow into Lake Taupo, and marking the fishing reserves along these same rivers; also a special survey of Tongariro River. The yearly cost of this work was £1,391 14s. 4d., and the total cost to date is £1,773 8s. 7d.

Traverse Closures.—The mean traverse closures for the past year as supplied by staff surveyors show an error of 0·22 links per mile on the meridian and 0·33 links per mile on the perpendicular.

Office and General Work.—Land Transfer Branch: A total of 216 plans were received for examination, and 224 were examined and approved; 1,501 deeds and other instruments were prepared, and 2,233 diagrams from plans were placed on certificates of title. The accumulation of unchecked plans has been cleared off, and the plans on hand at present only represent a normal number. An extra staff is put on to this work immediately it shows signs of becoming in arrears.

Native Branch: A total of 119 plans were received for examination, and 125 plans were examined and approved; 36 plans were compiled, 361 survey accounts were checked, 812 Court orders endorsed, 142 tracings made, 43 sun-prints, 78 authorities issued for surveys, 15 caveats lodged, 18 charging-orders obtained, and 6 Native Land Courts attended. Among the plans compiled were certified copies of the original Native Land Court plans of the towns of Otorohanga, Te Kuiti, and Taumarunui for the Land Transfer Department, as deposited plans.

Crown Lands Branch: In this branch 150 plans were received for examination and approval, and 162 plans were examined and approved. Plans compiled total 58; 107 sale plans were prepared, 989 tracings made, 253 plans recorded, 137 Proclamations entered, 185 chain-lengths tested, 1,042 diagrams placed on titles, 14 scheme plans dealt with.

Maps were completed of Rotorua and Hamilton for standard publication, and a map of Tauranga Borough was also sent forward for publication. The Waikato County map was revised and completed. Seventeen plane table sheets were prepared, comprised in the topographical surveys of Rotorua and Ngaruawahia; 35 survey blocks were completed on the 20-chain record maps.

Proposed Operations, 1928-29.—One surveyor and one assistant will be employed on topographical surveys in the Rotorua County, and the completion of the area for the Defence Department at Ngaruawahia. I anticipate that the open land in the Rotorua County will be completed during the coming year.

One surveyor will be employed on the Hauraki Plains on miscellaneous and rural surveys, levels, and engineering work.

One surveyor will be employed in Taupo District, in completing the Taupo fisheries, scenic reserves, roads, and township surveys that are necessary.

Three surveyors will be employed on miscellaneous work, comprising school-sites, road-deviations, new roads, railway, land plan surveys, and rural settlement, and Land Transfer and inspectional surveys. There is a large amount of the above class of work required in this district.

Contract surveyors have in hand the survey of 12,000 acres of Native land.

There were no changes of any importance in the office staff to record.

As referred to in my last year's report, it is noted that a large proportion of the expenditure incurred by the field staff in work for other Departments, local bodies, and the Board of Education is recoverable.

In conclusion, I wish to place on record my appreciation of the manner in which the officers of this Department have carried out their duties during the past year.

GISBORNE LAND DISTRICT (E. H. FARNIE, Chief Surveyor).

Minor Triangulation.—There has been nothing undertaken in this class of work during the year, but now that the secondary work in the district has been completed the minor should be put in hand, as it is urgently required to enable traverse-work to be checked to accord with the limit of error now required.

Standard Traverse.—There has been nothing done under this heading, but the main roads in the Poverty Bay flats should be undertaken, as all the centre-marks are being disturbed through tar-sealing the main roads.

Roads.—There is only one item, of 62 chains, costing £25 8s. per mile. Several deviations are in hand and will be completed during the coming year.

Rural and Suburban.—During the year 2,289 acres of rural lands were surveyed, comprising 20 lots in the Waiapu and Waioeka districts.

Native Land Court Surveys.—Under the above heading 15,942 acres were surveyed by contract surveyors, and 8,032 by staff surveyors, comprising 179 subdivisions, at a cost of 1.9s. per acre.

Work in Progress.—The subdivision of the Te Wera Estate, comprising 10,000 acres, has been completed; also Small Grazing-run 94, comprising an area of 2,987 acres. Several road-deviations in the Tuahu Survey District are at present under survey. The subdivision of Tapuaeroa 2A 1 has also been completed, comprising, 2,402 acres. The Tuparoa and Waiapu consolidation schemes are nearing completion, and should be disposed of during the coming year.

Office-work.—Land Transfer Branch: During the year 65 plans were received for examination, and 61 were approved, containing 144 lots, of an area of 9,570 acres; 89 traverse sheets were examined; 630 diagrams endorsed on certificates of title; and 39 leases and Proclamations were examined. Townships for approval under the Land Act: 5 plans were received and approved.

Native Land Court plans: During the year 49 plans were approved, comprising 233 subdivisions of a total area of 26,089 acres; 21 plans were compiled in office; 84 traverse sheets were examined; 817 diagrams endorsed on Court orders; 24 authorities were issued, 20 to contract surveyors and 4 to staff surveyors; and 46 certificates of costs were issued.

Statutory plans: During the year 24 plans were approved, representing $7\frac{1}{2}$ miles of road; 26 traverse sheets were examined. Three of the above plans were compiled in the office.

Crown plans: Under this heading 7 plans were examined and approved; 3 plans were also compiled in this office, containing 10 lots, with an area of 12,756 acres; 15 traverse sheets were examined.

Record maps: During the year 23 maps were prepared on a 20-chain scale; 20 sheets on the Opotiki District were forwarded to the Government Printer to be lithographed.

Miscellaneous tracings: During the year 250 tracings were prepared for the Valuation Department, gazetting purposes, reports, field surveyors, and Native Land Court; 41 sun-prints and 16 lithos were mounted; also 22 tracings and 74 plans were remounted.

Lithographic plans: Lithographic plans have been prepared of the Waimata and Matakaoa Survey Districts. Three sale-plan tracings were drawn and published during the year.

Transfers.—Mr. B. Thompson, of the draughting staff, exchanged positions with Mr. K. A. Bell, of the New Plymouth office.

In conclusion, I desire to thank the staff, both field and office, for their able assistance, willingly rendered, in carrying out the work of the Department during the year.

HAWKE'S BAY LAND DISTRICT (J. D. THOMSON, Chief Surveyor.)

Standard Surveys.—It was hoped that during the past year it might have been possible to carry out this class of work in Dannevirke and Hastings, more especially in the latter town. A certain amount of adjusting has been necessary on account of blocks being slightly disturbed on account of the operations of local bodies in tar-sealing and reconditioning of streets, &c. If possible, the Hastings work should be undertaken as soon as funds are available.

Topographical Survey for Scheme Purposes.—About 5,800 acres was brought under this heading during the year, and constitutes the Taratara-o-te-Rauhina Block, which was purchased by the Crown some years ago, the Maori Land Board lease of which expires shortly. The reason for the topographical survey was to ascertain the nature of the block and its possibilities as a cutting-up proposition. The costs of same is 3.1d. per acre.

Rural.—Under this heading there is an area of 1,051 acres, surveyed at a cost of 2.2s. per acre, the principal item being an area of 858 acres at Waimarama, the other areas being more or less scattered and small. This fact accounts for the cost per acre. There is 10,780 acres under this heading the field-work of which is almost complete.

Native Land Court Surveys.—Under this heading there is an area of 3,911 acres, at a cost of 2.1s. per acre, as against 4.2s. per acre last year. This is accounted for by the fact that the subdivisions were much larger, on an average, than last year.

Roads.—There is nothing returned as completed under this heading during the year, but there is $7\frac{3}{4}$ miles of which the field-work is completed.

Village and Suburban.—Under this heading there is an area of 58 acres, surveyed at a cost of 24.4s. per acre, and comprises 4 sections under 50 acres.

Town-section Survey.—Under this heading there is an area of 8 acres, consisting of 45 sections, at a cost of 45.1s. per section. The principal contributing items are the subdivision of seaside building-lots at Westshore, near Napier, and Pourerere, in southern Hawke's Bay, on the coast.

Field Inspections.—There was only one instance of this class of work during the year, and more will require to be done in the future.

Other Work.—Under this heading there is a miscellaneous assortment, at a total cost of £204 6s.

Work in Progress.—At the present time the staff surveyor has the subdivision of the Waimarama Crown lands in hand, consisting of about 3,900 acres handy to Napier. The balance of rural lands to be dealt with is the resubdivision of two small grazing-runs about 20 miles north of Napier. There is also $7\frac{3}{4}$ miles of road, of which only the plans are to be made. Contract surveyors have 375 acres in hand.

Office-work.—During the year 133 plans, comprising 516 lots and containing 3,539 acres, were approved; 230 traverse sheets were examined; 4,422 diagrams have been placed on instruments of title; 2,427 diagrams have been examined and passed; 161 plans were recorded, and 12 new plans for recording purposes were made.

Native Land Court surveys: During the year 26 plans, consisting of 56 lots and containing an area of 3,911 acres were received and approved; 35 traverse sheets were examined; 6 plans were compiled; 26 tracings were made for the Valuer-General; 284 diagrams were endorsed on Court orders; 29 authorities for survey were issued; amount of survey costs collected amounted to £1,025 15s. 1d.; 33 certificates of costs were made out for an amount of £403.

Statutory plans: 43 plans, having 42 lots, consisting of 24 miles of railway and road, with an area of 426 acres, were approved; 57 traverse sheets were examined. For the examination of plans and for tracings, &c., local bodies have paid £22 4s. 6d.

Crown plans: 34 plans, containing 90 lots and comprising 14,000 acres, were approved; 35 traverse sheets were examined; 60 diagrams have been endorsed for recording on settlers files; 5 district maps on a scale of 1 mile to an inch are in the course of construction; 1 town-map drawing (Napier) is nearing completion; tracings for Valuer-General, gazetting purposes, settlers, Field Inspectors, and general, 1,814; reductions, 1,025 (for district and other maps); sun-prints, 123; tracings for sale-posters, 15; diagrams on certificates of title and warrants, 134.

Future Operations.—There are some large areas in this district which have been purchased from the funds of the Native Land Settlement Account, but which cannot be dealt with for some time owing to the purchases being subject to leases of varying periods. The principal one is Waimarama, on which a certain amount of survey-work is still to be done, and which it is hoped will be offered early in the new year.

The Tatarao-te-Rauhina Block of 5,800 acres, will be available shortly, and its possibilities as to suitability for subdivision are now being looked into.

The Crown also possesses a valuable block of about 3,000 acres in the vicinity of Poukawa Lake. This land at present is being grazed under a temporary license, and it is hoped that the dewatering scheme will be so far advanced this year as to allow a certain amount of survey work being carried out. There have been incessant inquiries for this land, which, I believe, when the drainage scheme is completed, will be as good as anything there is in the district. The area lies about 24 miles south of Napier, and adjoins the Napier-Wellington Main Road and Railway-line.

The Mohaka Block is the subject of a consolidation of the opposing interests as between the Crown and Native owners. This should be completed this year, and a possible scheme of subdivision be arranged for consideration.

The Tutira Block, in which the Crown owns 19,000-odd acres out of a total of about 20,000, is at present the subject of a partition which there is a difficulty in concluding owing to the opposition of the few remaining non-sellers. However, it is hoped that the matter will be finalized at the July sittings of the Native Land Court, and if this eventuates it will be possible to carry out a large amount of survey work on the block to separate the opposing awards.

Other future work will consist of a number of miscellaneous matters on hand and which will arise during the year.

Standard Lithography.—A fair amount of progress has been made with this work during the year, although it has been somewhat retarded by the over-increasing amount of routine work. Four district maps will be completed early, and the new Napier map should be forwarded for publication within the next two months.

An endeavour will be made during the year to push ahead this work, and the ever-increasing efficiency of the staff in this particular work will materially assist. It may be worth mentioning that over half of the district is now clothed with new 1-mile-to-the-inch maps, and if the work could be undertaken steadily three years should see it completed.

Land Transfer Index Maps.—It has not been possible to make much progress with this work owing to the large amount of routine work. Those maps already completed are being continually revised and used as far as possible. Some of our roll maps are falling into disrepair, and I am most anxious to push on with this work when circumstances will permit.

General.—In a general review of the work for the year it will be seen that a good average has been maintained. This is noticeable principally in relation to the office-work, which it is believed will further increase during the year. The diagram-work of the Land Transfer Branch was undertaken by the junior officers.

Staff.—During the year Mr. W. E. Lynch passed the second-grade Draughtsman's examination, and Messrs. Harding, Burton, and Ellis passed in plan-work.

Mr. Harman, temporary draughtsman, resigned during the year, and his place has not yet been filled, and it is hoped a cadet will be appointed in the near future.

The staff have carried out their respective duties during the year in a most satisfactory manner, and have given efficient and loyal service. The standard of work throughout has been excellent, and the junior officers and cadets have made marked progress, and I wish to record the keenness in their ambition to become efficient and useful officers.

Mr. Woodley joined the staff during the year, and is a good type of lad.

TARANAKI LAND DISTRICT (W. D. ARMIT, Chief Surveyor).

Standard Surveys.—(a) Borough: The standard survey of the Borough of New Plymouth has been continued by Mr. A. C. Haase, acting under the direct control of the Surveyor-General. The field-work for this survey is now almost complete, and a set of plans has been prepared in this office and await the field information.

(b) Rural: Authority has been granted to have certain lines of rural standard traverses run in the South Taranaki District, and also a traverse via the Main Coast Road from Patea to New Plymouth. This work is being commenced at the beginning of April by Mr. J. W. McIntyre. Owing to tar-

sealing making redefinition work difficult, and the presence of many plantations in the closely settled areas causing the trigs to become useless, this standard traverse work will prove of great use, and it is pleasing to be able to put the work in hand. It is also hoped to repair the signals over those trigs still used, and which will be of use apart from the standard traverse.

Topographical Survey.—General: The general topographical survey of part of the district was continued by Mr. A. V. Adams with two assistants. He returns 115 square miles completed and mapped, while another 134 square miles is completed in the field but not completely mapped. Returns at the 31st March, 1928, show a grand total of 424 square miles completed in the field, of which 274 square miles have been mapped. For the year under review the completed cost runs out at 82-6s. per square mile. A further 4 square miles of the contour survey of the Egmont National Park were returned, making 16 square miles of this survey completed in the field. This work has not yet been mapped. It is hoped to complete this Mount Egmont area next summer.

Eighty-four miles of levels were run during the year, and 82 bench-marks inserted, making a grand total of 237 miles of levels run and 127 bench-marks inserted since the commencement in November, 1925, of this survey.

Rural.—An area of 4,185 acres is returned under this heading. This includes a 1,400-acre scenic reserve in the Tangarakau Gorge, and the balance is comprised of many small and scattered surveys.

Native Land Court Surveys.—The total area of Native Land Court surveys completed during the year amounted to 4,367 acres, the whole of which was done by private surveyors under authority. An area of 462 acres is now under survey by contract surveyors.

Roads.—Only two surveys, totalling 2.1 miles, were carried out during the year.

Other Work.—An amount of £641 17s. 5d. has been expended under this heading during the year. It includes the traverse and grading of 13 miles of roads and tracks in Egmont National Park; two timber appraisements; two coastal reserves defined; and boundary redefinitions by Mr. McIntyre, and some boundary redefinition work by Mr. Adams.

Inspections.—Inspections of two Land Transfer surveys in the Town of New Plymouth and one in Paritutu Survey District were carried out by Mr. McIntyre.

Office-work.—Land Transfer Branch: In this branch 92 plans, comprising 361 lots and 5,710 acres, were examined and approved, and reported on to the District Land Registrar; 2,206 diagrams were placed on instruments of title, 1,162 being issued under the compulsory Act; 588 Land Transfer leases, Native Court orders, and Crown leases, &c., were examined and passed; 92 tracings of Land Transfer plans were prepared for the Valuation Department; 20 index maps of districts on a 20-chain scale and 30 in. by 30 in. size were drawn for the Lands and Deeds Department.

Native Land Branch: 18 authorities for 47 partitions, representing an area of 1,279 acres, at an estimated cost of £362, were issued during the year to private surveyors; 20 plans and duplicate tracings for 47 partitions of an area of 4,367 acres were received and approved for the year; the survey costs (including cost of checking plans and interest due) collected amounted to £723 6s.; 96 diagrams were endorsed for attachment to partition orders; 49 applications for charging-orders and 49 certificates of cost were forwarded to the Native Land Court; 58 liens, amounting to £774 9s. 6d., were released; 16 vouchers for survey costs amounting to £476 1s. 7d., covering 42 subdivisions and totalling 4,177 acres, have been prepared in this branch and forwarded for payment to contract surveyors; 317 plans were forwarded for use at Native Land Courts, and when necessary the Native Land draughtsman has attended the various Courts in the district. It is expected that the Native Branch will be called upon to supply a large amount of information in connection with the Native Land Consolidation Commission recently set up.

Computing Branch: The total number of plans checked under all headings in this branch amount to 81, comprising 135 sections and totalling 28,444 acres. A great amount of this area was comprised in the plans of the Heao Valley Scenic Reserve, in Mahoe and Kiri Survey Districts, the survey of which was completed last year. 40 Proclamation duplicate plan tracings were examined. Of the above total area, 3 surveys of scenic reservations comprised 20,236 acres. Crown settlement comprised 15 plans, of 3,326 acres. The greater portion of this was made up of alterations to existing leases and surveys in the Ohura and Matiere Settlements. Native Land Court Surveys were represented by 20 plans, one of which was compiled. The balance of the plans were mainly road and other takings under the Public Works Act, office compilations, and boundary-redefinition plans.

Draughting Division: For photo-lithography maps of the Boroughs of Eltham and Waitara were drawn, also a new drawing of the Mapara and Pahi Survey Districts. The map of the land district and also the drawing of Opunake Survey District were revised. This work was all forwarded for reproduction. Ten sale plans were prepared; compiled plans were prepared for Native Land Court and for road-closure procedure. In addition, the plans for the New Plymouth standard survey were commenced, and six index maps of various villages and eight maps of Kaupokonui and Opunake Survey Districts were prepared. The latter are 20-chain maps, and are accurately plotted with a view to later use for the topographical survey.

Miscellaneous: The usual tracing-work has required constant attention during the year, and the supply of maps and tracings for the two Deteriorated Land Revaluation Committees in this district may also be included here. The supply of information to the public, selector's tracings, surveyors' data, letter illustrations, Proclamation tracings, &c., have required a total of 847 tracings.

Proposed Operations in Field for 1928-29.—Mr. McIntyre will commence the rural standard traverse in the South Taranaki District as mentioned above. He will also carry out any spotting surveys as required.

Mr. Adams will continue the topographical survey of portion of the Taranaki District, including Egmont National Park. He will also undertake any small surveys as required.

WELLINGTON LAND DISTRICT (F. H. WATERS, Chief Surveyor).

Triangulation.—During the year 7 square miles of connecting triangulation in the Akatarawa District were completed.

Rural.—Subdivisions in Kuku, Almadale, Putorino, Heatherlea, Westmere, Tiraumea, Moroa, Falloon, and Makopua Settlements; surveys of Maungakaretu Block; part of Section 31, Rangitikei Agricultural Reserve; Section 26, Block VI, Hautapu Survey District; Section 132, Block IV, Tiffin Survey District; and Section 3, Block X, Ruahine Survey District—a total of 37 sections, of an area of 7,973 acres—were completed.

Village and Suburban.—Surveys of gravel reserve, Block VIII, Port Nicholson Survey District; parts of Hutt Valley Settlement; and Sections 12 and 15, Block VIII, Hautapu Survey District—a total of 7 sections, of an area of 120 acres.

Town.—Comprises surveys at Porirua, Heretaunga, and Foxton—3 sections, of an area of 3 acres; also subdivisions, Hutt Valley Settlement, 619 sections, of an area of 156 acres.

Roads and Railways.—5 miles of Wellington-Wairarapa Main Highway, 52·7 chains of railway, Hutt Valley Settlement, and 5·3 miles Otahome Settlement Road and Whakataki-Mataikona Road were surveyed during the year.

Topographical.—Comprises surveys of part Tongariro National Park, and watercourses, Block IV, Waitohu Survey District—a total of 272 acres.

Inspection Surveys.—During the year several inspection surveys were made in the district. The work generally was found to be satisfactory.

Other Work.—Includes surveys of land taken for road, part Section 170, Hutt District; sewer easement, Wilford Settlement, Lots 3 and 4, D.P. 1744; Sections 4 and 5, Block XII, Hutt Valley Settlement; part of Section 39, Hutt District; river erosion, Mangatainoka Block; school-site, Lansdowne; river erosion, Ahiaruhe Settlement; Carterton Post-office site; resurvey of roads, Hutt Valley Settlement; alteration, railway-workshops site; investigation of claims, Rangitikei River deviation; widening of Bouverie Street, Petone; report on Section 4, Block IV, Momahaki Survey District; redefinition old boundaries, Lot 3 of Section 23, Block IV, Kaitieke Survey District; and the measuring of bush area, Section 3, Block X, Ruahine Survey District.

Land Transfer Branch.—505 plans were received, 546 plans examined, 522 plans approved, 3 plans compiled, 26 applications were examined, 3,052 transfers and other dealings were examined, and 10,312 diagrams endorsed on new certificates of title.

Native and Crown.—42 Crown and 76 Native plans were received; and 34 Crown and 64 Native plans, of a total of 914 subdivisions, of an area of 34,922 acres; were approved.

Native.—66 authorities to survey; 177 partitions, of an area of 22,784 acres, at an estimated cost of £3,252, were issued; 63 plans and duplicate tracings have been received from surveyors for 200 partitions, of an area of 22,200 acres, at a cost of £3,032 12s. 3d.; 1,069 diagrams were endorsed on Court orders and forwarded to Native Land Courts; 364 applications for charging-orders were prepared and forwarded; 70 vouchers were prepared, checked, and passed for payment, amounting to £2,890 5s. 1d.; liens totalling £2,239 1s. 9d. have been received and notices of release forwarded to Native Land Courts; plans have been forwarded to the various Courts in this district.

Statutory Branch.—143 plans were received, 140 plans examined, 137 plans approved, 118 plans were sent forward for Proclamation purposes, 139 plans were recorded, 136 Proclamations were gazetted and received, and final action was taken on 115 plans. Other work includes general and special searches, recording alterations on local bodies' boundaries, the preparation of information for the issue of closed-road titles, technical descriptions of lands to be reserved and exchanged, the preparation of information in connection with the loading for roads in loan blocks, &c., and the preparation of plans and documents and the obtaining of consents in connection with legislation work undertaken by this Department.

Office-work.—10 plans were compiled, 50 photo-lithographic tracings were prepared, 872 diagrams were endorsed on Warrants, 1,174 diagrams on Crown leases, 904 diagrams on Native Land Court orders. In addition, the usual large amount of miscellaneous drafting, searching, and tracing has been carried out.

Changes of Staff.—Messrs. L. J. Poff and H. J. Fletcher were transferred to Auckland; Miss M. MacPherson and Messrs. Armstrong, Lowe, Reid, and Rogel joined the drafting staff, and Mr. Organ the field staff; Mr. A. J. Dry resigned.

It is with much regret that I record the death of Mr. S. Parkinson. For years he was on the field staff of this district, but latterly, on account of failing health, became a member of the Computing Branch of this office. A popular officer, he is mourned by all.

I must record my appreciation of the co-operation of the staff under the supervision of Land Transfer Draughtsman Mr. C. A. Gordon and Senior Draughtsman Mr. R. W. Collins, who have handled the increased volume of work in an entirely satisfactory manner.

MARLBOROUGH LAND DISTRICT.

(J. STEVENSON, Chief Surveyor.)

Topographical.—Under this heading an area of 170 acres is returned, which represents a portion of provisional State forest now added to a scenic reserve, and which at the present time does not warrant a more accurate survey.

Rural Surveys.—Three areas, aggregating 1,329 acres, are returned under this heading, of which two are of scenic reserves and the other a Crown-land selection.

Village and Suburban.—32 sections, totalling 131 acres, are returned under this heading, and range from the Marlborough Sounds to Kaikoura. Included under this heading is a survey in Queen Charlotte Sound of seaside-residence sites ranging from 1 to 10 acres.

Roads.—13 miles of roads were surveyed during the year at a total cost of £158 and averaging £12 2s. per mile. Included in this return are 8 miles of the newly formed road in the Upper Wairau Valley, destined to become the Marlborough—West Coast Main Highway.

Other Work.—Expenditure under this heading totalled £31 10s., and includes three inspections of Land Transfer Surveys and the erection and repair of permanent trig. signals within the district.

Rural Standard Road Surveys.—Since the original survey of the alluvial flats within this district, when large portions of them were in a more or less swampy condition, it has been found that the Crown-grant roads, by reason of the unsatisfactory nature of the ground, have diverged considerably from their original positions. Now that the lands have been drained and the roads in use become permanent, it is found necessary to have the present positions defined and marked with permanent stations. Under this heading are returned some 10 miles of standard survey of the Grovetown and Spring Creek Villages and their environs, and 13 miles of the Picton—Blenheim Main Highway. The total cost of this year's operations is £600 13s. 2d., an average of £26 4s. per mile.

Proposed Operations for 1928-29.—Mr. Clapperton will continue the rural standard survey, of which some 60 miles remains to be done. Native-land surveys of various blocks, totalling 580 acres, will be put in hand during the year, some 5 miles of road-deviation made, and a number of small scattered surveys will be executed by the office staff as circumstances permit.

Office-work.—50 plans were received by the Survey Branch for examination, of which 39 were road and other departmental plans and 11 Crown surveys; 80 diagrams were placed on leases, Native Land Court orders, and certificates of title by Warrant; 29 original working-plans, 28 town and rural standard plans, and 3 new record plans were drawn by the draughting staff; 70 plans were copied and 258 tracings made. Several photo-litho maps were brought up to date, and a considerable amount of work done in connection with the 20-chain Land Transfer and road-record maps.

Land Transfer Branch.—This work is carried out in conjunction with the ordinary Survey Office work. During the year 41 plans of 165 lots, aggregating 11,324 acres, were received and examined, 1,174 diagrams placed on certificates of title, and 521 deeds, transfers, and other dealings examined and passed.

Staff and General.—During the year Mr. W. Rogel was appointed to the draughting staff in place of Mr. McLeod, who resigned during the previous year. Mr. Rogel was transferred to Wellington in January last, and Mr. D. K. Walker, of Christchurch, appointed to fill his position.

The Chief Surveyor (Mr. Stevenson) has now been away on Deteriorated Lands Committee work for a year and eight months. This has thrown a considerable amount of extra work on myself and staff.

I desire therefore to place on record my appreciation of the loyal co-operation of both field and office staffs, and of the very efficient manner in which they have carried out their respective duties.

NELSON LAND DISTRICT (A. F. WATERS, Chief Surveyor).

Rural Surveys.—A total area of 1,599 acres has been subdivided into 8 sections. The surveys involved in this work were scattered all over the district, and were reduced to cutting out odd pieces of Crown land applied for.

Village Suburban.—50·2 acres were subdivided into 49 lots under this heading.

Town-section Surveys.—An area of 24 acres in the Town of Westport was laid off into 188 lots for the purposes of the Westland and Nelson Coalfields Administration Amendment Act, 1926. Most of the ground covered was closely built over, which involved a large amount of work in fixing the boundaries to include all the buildings under one occupation.

Roads.—A total length of 3½ miles of formed roads was surveyed in various parts of the district, most of the work being in the nature of deviation surveys.

Other Work includes a report on town-scheme subdivision, engineering surveys, refixing position of trig., inserting reference marks for replacing standard blocks removed in the course of street-works, redefinition of section boundaries, &c.

Inspection.—Only one inspection of a private surveyor's work was made during the year. The result was satisfactory and showed that the work was well up to the required standard.

Office-work.—In the Land Transfer Branch 103 plans have been examined and approved for the year, 721 deeds and other instruments dealt with, and 15 diagrams on titles amended; 34 plans of Crown lands have been examined and approved, and 13 statutory plans have been examined and approved for other Departments and for local bodies; 6 plans were compiled; 230 diagrams were endorsed on leases and titles; the drawing of 5 standard publications was completed; and 7 lithographs were published. In addition the usual office-work of preparation of tracings, recording of plans, attendance on the public, &c. have kept the staff well occupied.

Staff.—During the year Mr. E. N. Allan passed the examination in second-grade computing, and several of the other officers are preparing for the departmental examination to be held this year.

Mr. T. P. Mahony, draughtsman, was transferred to the North Auckland office during the year, and his place was filled by Mr. R. P. Fletcher, of that office. The numerical strength of the staff has been increased by the addition of a cadet.

In conclusion, I have to express my appreciation of the manner in which the members of the staff have performed their duties during the year and for their co-operation in attention to departmental interests.

WESTLAND LAND DISTRICT (W. T. MORPETH, Chief Surveyor).

Field Staff.—During the year 45 plans were handed in by the field staff, representing field-work completed of 2,920 acres rural, 36 acres village and suburban, 17 acres town lands, 30 miles of road, and miscellaneous surveys.

The settlement surveys comprised principally small scattered areas surveyed from time to time to meet applications for unsurveyed lands. The roads surveyed included some 11 miles of the Grey Valley—Maruia Road deviation, portion of which is in the Nelson Land District; a new road-line graded and surveyed between Harihari and Wataroa (about 7 miles), proposed to be used as a stock route to relieve traffic on the Main South Road; and 3 miles of the Bruce Bay Beach Road, surveyed for the Public Works Department.

Work to be put in hand shortly includes the survey of about 50 acres at Waiho Gorge, which it is proposed to have set aside as a recreation reserve in order to meet a popular demand by visitors to the glacier region for an area suitable for sports and games. As in the past, a number of applications may be expected for unsurveyed areas, which will engage the attention of the field staff for a portion of the period. The usual calls for statutory surveys and reports and inspections in various directions may also be expected. It is also possible that a resurvey of the Arahura Native Reserve will be undertaken, as the old survey done in the year 1890 has been found defective, and the Native Trustee is at present in negotiation with this Department regarding survey requirements preparatory to having an ordinary certificate of title under the Land Transfer Act issued him. This work would engage a surveyor for about four months.

A good standard of work is being maintained, the limit or error in measurements being well within that allowed by regulation. Traverse closures were returned by the two staff surveyors for varying distances totalling 11 miles, with 111 stations, the total error being 4.3 links on the meridian and 1.8 links on the perpendicular, representing a reduced error of 0.31 and 0.34 links respectively.

Draughting Staff.—Plans approved during the year numbered 80, classified as follows: Land transfer, 21; settlement, 24; town, 3; statutory, 18; mining, 4; and miscellaneous, 7. Also, 11 plans were compiled by the office staff, 533 tracings (including one traced for lithography), were prepared, 86 lithographs coloured, 21 lithographs and 27 plans mounted, 22 20-chain record maps completed, and 3 40-chain application maps completed. Diagrams placed on instruments of title numbered 799.

Steady progress has been made with the preparation of the 20-chain record maps. A number of these have yet to be prepared, and will engage the attention of the staff during the ensuing period as opportunity occurs. Replacements of a number of worn-out application maps are also required; in these cases, however, mounted tracings will be suitable, more economical, and will probably wear equally well as prepared drawing-paper.

It was found necessary to have additional plan-drawers fitted in the safe to relieve congestion in the plan-storage, the position in this direction being now satisfactory, except that about one dozen additional of the small drawers are necessary, and authority to have these installed will be applied for through the usual channels. With these additions sufficient storage space will be assured for many years ahead.

Recording-work has been well maintained, and both field and indoor officers have shown a keen and intelligent interest in their work. Mr. F. Rochfort was successful in obtaining a second-grade computer's certificate, and Messrs. B. E. Andrewes and W. H. Steel second-grade draughtsmen's certificates at the last and the previous year's examinations.

CANTERBURY LAND DISTRICT (W. STEWART, Chief Surveyor).

Standard Surveys.—The standard survey of the Borough of Timaru has been continued during this year by Mr. H. A. Adams, and about 24½ miles has been done, leaving approximately 1½ miles yet to complete. A start will then be made on the rural extension north and south of the borough for about 2 miles in either direction along the Main South Road. In connection with standard surveys and permanent survey marks, I might state that these are being preserved and replaced as far as possible, as, owing to the extensive trenching operations and permanent road-surfacing carried out by the various local authorities, a great many surveys marks have become unstable and difficult to redefine.

Field Staff.—The field staff consists of Mr. H. A. Adams and Mr. W. Paora. During the year 40 plans were handed in by the field staff, representing field-work completed of 17,476 acres of rural, 9 acres town sections, 13 miles of road and drainage surveys. Of these plans, two represented a comparatively large area in the Hunters Hills subdivided for selection: the remainder consisted of necessary surveys of education reserves, resubdivision of settlements, subdivisions of Native reserves, small township surveys, and miscellaneous surveys. The work in hand consists of some 8,783 acres rural, being several pending subdivisions of settlements and necessary surveys of education reserves, 28 acres of township sections, 65 miles of road, 71 acres Native reserves, and extension of rural standard survey. Traverse closures returned indicate that a high standard of efficiency has been maintained, the average for standard work over circuits of 11.3 miles, representing 154 stations, being 0.035 on the meridian and 0.051 on the perpendicular, and the average for rural surveys over circuits of 13.9 miles, representing 126 stations, being 0.9 on the meridian and 0.8 on the perpendicular.

Town Surveys.—These represent 44 sections, of a total area approximately 9 acres, and comprise 5 surveys of Crown lands to meet the demand for sections in growing townships and 3 for other Departments for sale and mortgage purposes.

Road Surveys.—These consist of 1 road-deviation in an education reserve, 4 surveys for local bodies, 2 surveys for Public Works Department, and 1 drainage survey; total (approximately), 13 miles.

Rural Surveys.—These consist of 2 surveys for subdivision of a pastoral run, 1 survey of an education reserve, 2 surveys for exchange purposes, 2 resubdivisions of settlement land, and 1 survey of river erosion: total area (approximately), 17,476 acres.

Native Surveys.—These consist of 6 surveys, of a total area of approximately 318 acres, carried out under Native Land Court partition orders.

Other Work.—This consists of 1 compass survey, 2 contour surveys necessary for the proper laying-out of extension of townships at Arthurs Pass and Hanmer, 4 investigation surveys, supervision of standard stones and permanent survey marks, and reinstatement of same where necessary.

Office-work. General: A slight falling-off in plans examined and passed is shown for this year, being a total of 67, as against 80 for last year. The number of diagrams placed on instruments of title remains about the same, being 458, as against 452 for last year. 843 miscellaneous tracings were prepared during the year, and 70 town-plan schemes were dealt with. Very little photo-lithographic work was done during the year, there being only 2 sale plans prepared: this is due to the economical practice of using the newspapers for advertising, and consequently pull-offs are used instead of sale posters. Two standard publications were prepared, being new lithographic maps of the Borough of Waimate and Upper Ashley Survey District: 2 counties, 2 survey districts were revised during the year, and 1 county is in hand: 19 20-chain record maps were compiled and 4 are in hand, while 1 40-chain record map was redrawn. The usual routine work, such as recording, searching, compiling, miscellaneous, &c., has been well maintained and is steadily increasing, it being often found necessary to divert officers doing photo-lithography to this work.

Land Transfer: In this branch 479 plans were examined and passed, 7,448 diagrams were examined and placed on instruments of title, and 2,844 deeds and other instruments examined and passed. The diagrams drawn include 1,552 certificates under the Compulsory Registration Act: 165 tracings were prepared for the Valuation Department. In addition to current recording of plans, road dealings, Proclamations, &c., 6 new record maps were prepared, besides renewing 10 worn maps, and various tracings were prepared for the purpose of special notice, &c.

Staff.—There has been no change in the staff during the year, and I have pleasure in recording that Mr. L. Harding and Mr. E. Pfankuch succeeded in passing the draughtsman's examination (second class), and Mr. C. B. Robson the computer's examination (second class).

OTAGO LAND DISTRICT (R. S. GALBRAITH, Chief Surveyor).

Triangulation.—The only work of this class undertaken during the year was the establishment by Mr. D. M. Greig of a station in Waipahi Survey District on a new position, and a connecting triangle to the Town of Waipahi. I would again urge the need of a systematic revision of the trigonometrical work throughout Otago. The work, with one or two exceptions, is old and not up to the standard of accuracy required under modern conditions.

Native Surveys.—An area of 125 acres, divided into 12 sections, being partition surveys carried out under Court Orders, was done by Mr. D. M. Greig in the Waikouaiti Native Reserve.

Settlement Surveys.—An area of 5,346 acres was put through, Mr. Phillipps doing 2,316 acres and Mr. Greig 3,030. Of the former, 2,268 acres consisted of two sections cut off one of the Bannockburn Runs, and the rest of small areas. The 3,030 acres done by Mr. Greig included the subdivision of the Tuapeka Commonage, 1,366 acres. This area was to a large extent covered with thick scrub and entailed a lot of cutting. The balance, excepting Run 51B, of 1,397 acres was made up of small spotting surveys scattered over a wide area.

Mining.—This work has been done by private surveyors acting on behalf of applicants.

Roads.—Mr. Phillipps did 97 chains of road-deviation for the Vincent County, and 47 chains of deviation of the Muddy Creek Sludge Channel at Lauder.

Field Inspections.—Three inspections were done by Mr. Greig, the first to determine the accuracy of certain points in the Town of Waipahi adopted by Mr. James Adam, in connection with a deviation of the main highway. Advantage was taken of the opportunity to definitely fix some of the principal corners of the town and permanently mark them. An inspection was made of a survey by Mr. L. O. Beal in the Arcade, Dunedin, and of a survey by Mr. F. J. Williams at Sawyer's Bay. You have been advised of the result of these inspections.

Office-work. The volume of office-work put through during the year was up to the average, a special effort being made to bring the Land Transfer record maps up to date by getting the older Land Transfer surveys recorded. I am able to report that 21 districts have been dealt with as opportunity permitted. The work of preparing duplicate copies of the Dunedin standard survey plans has also gone on in the spare time, 14 sheets having been traced and mounted. The duplicates already completed have been the means of saving the original sheets from much wear. It is hoped to have them all copied shortly. The revision of the 40-chain district maps for photo-litho and the preparation of fresh drawings for publication is proceeding steadily, the following districts having been redrawn: Cairnhill, Wilkin and Young, McKerrow and Haast, Clutha and South Molyneux. The maps of Benger, Bannockburn, and Tuapeka East were revised. In addition to these, Town of Pembroke and Borough of Lawrence were drawn, and 11 sale posters made. The Land Office maps were renewed as required, 9 additional maps being supplied. Plans for the field staff and plotting other working-plans amounted to 47 sheets in all. The plans received from staff and private surveyors for examination and approval were—Rural, 40; road and railway, 53; trig, 1; Native, 3; mining, 3; town, 6; Land Transfer, 115. Diagrams were placed on instruments of title as follows: Warrant certificates of title, 158; leases and licenses, 562; Land Transfer certificates of title, 3,636; Native Court orders, 102; and miscellaneous, 9. A total of 748 working and general tracings were made, and 326 diagrams were prepared of land transactions for Valuation Department, and 175 deposited plans traced for the same: also 26 tracings in triplicate and schedules for road Proclamations.

The map-mounter reports 1,074 maps mounted, 165 books bound, and 10,980 forms printed.

A work that will have to be undertaken in the near future is the numbering of all the plans in the safe, and the preparation of a proper plan-index. It is hoped to make a start on this during the current year.

Proposed Operations for 1928-29.—Mr. Phillipps will carry out the resurvey of Runs 244i, 244e, 244k, Tiger Hill S.D., and do any spotting surveys in Otago Central.

Mr. D. M. Greig will undertake the extension of the standard survey of the Borough of Port Chalmers, and upon the completion of that carry on with some education reserves which require resurvey for the issue of titles under the Land Transfer Act, and also some Native surveys and various spotting surveys in different districts.

There will probably be a fair amount of field-work to be done in this district in the near future, owing to the lessees of small grazing-runs converting their tenures to renewable leases: many of the older run surveys not being accurate enough for the issue of more permanent titles, fresh surveys will be required.

There is an urgent need for standard work in Otago, both in the towns and rural districts. The Land Transfer surveys in the Borough of Oamaru are getting into a very unsatisfactory condition owing to the absence of a standard survey. The same applies in a varying degree to all the towns. In many instances original markings have disappeared completely and there is nothing upon which to base a Land Transfer survey. The completion of the standard survey of the City of Dunedin and Borough of St. Kilda is also a matter needing early attention.

The standard survey of Inch-Clutha, which was commenced by Mr. Langmuir and carried on by Mr. Burton, has remained untouched since the latter's death. A considerable sum has been spent on this work, and is wasted until such time as the work is carried to completion and the information made available for the use of surveyors generally. Standard traverses are also needed on the Taieri and Tokomairiro Plans.

SOUTHLAND LAND DISTRICT (N. C. KENSINGTON, Chief Surveyor).

Standard Surveys.—The standard survey of the Borough of Invercargill has been continued by Mr. Otway, acting under the direct control of the Surveyor-General.

Rural.—14 surveys were completed, of 2,667 acres, divided into 34 sections.

Native Land Court Surveys.—Two Native Land Court surveys, containing 92.5 acres, were carried out by a private surveyor.

Village and Suburban.—Under this section 4 surveys, totalling 116 acres, were divided into 33 sections.

Town-section Surveys.—89 sections were laid off in 3 surveys, with a total area of 24.7 acres.

Mining Surveys.—Two surveys in this class have been done by private surveyors under arrangement with the applicants.

Roads.—Only 1.7 miles of road-deviation and road-widening was carried out.

Other Work.—Under this heading is included the Fiordland exploration and topographical survey, the survey of grave-plots at Riversdale, completion of plans of Lillburn Block, levels for drainage Oteramika Hundred, an inspection survey, survey of 8½ miles of old river-bed, the exploration of 8,000 acres of bush land in Longwood district with a view to subdivision for settlement, and the chainage of a base to check minor triangulation in Oteramika Hundred. The Chief Draughtsman while visiting Stewart Island repaired one of the original trigs, which was liable to be disturbed by the Marine Department, by taking out the original wooden peg, and cementing a pipe in the old position, and reference bearings were thrown down on to the Town of Oban.

Inspection Surveys.—Mr. Preston made an inspection of a Land Transfer survey, and the Chief Draughtsman made inspections of 2 Native surveys in Paterson Survey District, with satisfactory results.

Traverse Closures.—A summary of some of the staff surveys carried out by Mr. Preston shows that 19 miles, controlled by 189 stations, closed on an average to 0.16 and 0.17 links per mile.

Proposed Operations in Field.—Mr. Preston to complete surveys required and in hand.

Office-work.—During the year ending 31st March, 1928, 72 Land Transfer plans with a total area of 3,630 acres, and 45 Survey Office plans of various descriptions totalling 4,952 acres, were examined and approved: 249 diagrams were placed on Crown leases and other various documents; 2,186 diagrams were placed on certificates of title for Land Transfer purposes, and diagrams on 1,185 Land Transfer instruments of title were examined and passed; 275 working, 136 ordinary, 9 poster, and 75 valuation tracings were made, being a total of 495 tracings; 12 survey Office plans were completed, 25 plans, 18 tracings, and 231 lithographs were mounted, and 117 lithographs were coloured; 5 working-plans were redrawn, 1 application and 12 Land Transfer sheet record maps were drawn, and 107 plans were recorded on various maps; 9 tracings were drawn for photo-lithography, and 3 standard publications were revised; 8 standard plans were drawn, and a large wall map, 9 ft. by 9 ft., of the Southland Land District, on 80-chain scale, was made; 5 index maps of various boroughs were made for the Valuation Department, and 5 index maps were brought up to date for the same Department. The compilation of data for the new plan register has been steadily proceeding, notwithstanding interruptions to this work through shortage of staff.

Staff.—During the year Mr. G. F. M. Stewart succeeded in passing the computers' examination (second grade). Miss Macpherson was transferred to the Wellington District Office, and a new cadet was appointed; and Mr. W. R. Creeser, draughting cadet, resigned.

The staff have carried out their duties in a very satisfactory manner, and I wish to refer particularly to the progress made by the cadets and younger officers, and their keenness to become useful and efficient officers.

APPENDIX III.

SURVEYORS BOARD.—ANNUAL REPORT, YEAR ENDING 31ST MARCH, 1928.

THE Board's functions were carried out continuously, examinations being held during the period covered by this report in September, 1927, and March, 1928.

At the September examination, the only one at which new candidates presented themselves, thirty-three sat, twenty-four being new and nine completing previous sittings. Of these, fifteen passed the examination which was set by this Board.

At the March, 1928, examination, when only candidates completing are accepted, twelve sat, of whom six passed. For this examination the papers were set by the Tasmanian Board.

During the year under review the matter of the new uniform examination regulations required to carry out our obligations under the reciprocity arrangements with the Australian States was completed, in that the amended regulations first, and secondly amendments to the Boards Act necessary to enable the regulations to be promulgated, were finally dealt with and the results sent forward to the Government. The new Act is now awaited.

The matter of a diploma in surveying, which the New Zealand University has been asked by the Board to institute, has been advanced. The Board met Professor Steele and discussed with him the desiderata for the subject, and the University Committee has reported thereon. Further consideration to evolve rules and prescription for the diploma is now in hand.

W. T. NEILL, Chairman.
M. C. SMITH, Secretary.

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