

1925.
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. MINISTER OF LANDS.

SIR,—

Wellington, 2nd July, 1925.

I have the honour to present herewith the report on survey operations for the year ended 31st March, 1925.

I have, &c.,

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

W. T. NEILL,

Surveyor-General.

REPORT.

THE main parts of this report comprise a summary of the operations of the field parties, grouped under appropriate headings, and a brief account of the office-work performed during the year under review.

Of the sixty-seven surveyors employed, thirty were staff and thirty-seven contract surveyors, while apart from these a number of cadets and assistants were employed.

The attached Tables A, B, and 1 to 5 inclusive, contain a concise summary of the amount of work completed during the year. Full details are given in the reports by the Chief Surveyors for each land district, which are filed as departmental records.

Under the heading of "Rural Surveys" in Table B an area of 90,837 acres is shown as completed work, as compared with 266,308 acres for last year, a decrease of 174,721 acres; and under the heading of "Native Land Surveys" the area of completed work is shown as 211,747 acres, a decrease of 133,753 acres as compared with last year's return.

The average cost per acre of rural and Native land surveys shows an advance of 5d. and 6d. respectively on last year's rates. This advance in the cost of the work is principally due to the smaller areas of the blocks that have been subdivided. The work, however, is being done at a reasonable price.

TABLE A.

Class of Work.	Area, &c.	Average Cost.	Total Cost.
			£ s. d.
Topographical, by staff surveyors	68,000 acres	3-78d.	1,071 19 8
Triangulation, by staff surveyors	15,860 "	1-98d.	130 12 2
" by private surveyors	55,000 "	0-88d.	200 0 0
Rural, by staff surveyors	90,837 "	2-46s.	11,184 6 9
" by private surveyors	750 "	Not available	..
Suburban, by staff surveyors	2,030 "	13-53s.	1,373 2 4
" by private surveyors	5 "	60-00s.	15 0 0
Town, by staff surveyors	633 sections	£2-64	1,670 15 9
" by private surveyors	1 section	£10-00	10 0 0
Native Land Court, by staff surveyors ..	23,167 acres	2-91s.	3,374 11 7
" by private surveyors	188,580 "	2-07s.	19,535 2 7
Roads by staff surveyors	131-30 miles	£32-93	4,323 1 9
" by private surveyors	2-30 "	£23-04	53 0 0

TABLE B.

Land District.	Rural Survey.	Native-land Court.
	Acres.	Acres.
North Auckland	10,995	6,024
Auckland	30,296	103,209
Gisborne	1,187	8,749
Hawke's Bay .. ..	..	42,918
Taranaki	11,859	11,778
Wellington	3,729	37,262
Marlborough.. ..	..	148
Nelson	2,284	75
Westland	3,342	865
Canterbury	5,158	400
Otago	1,087	319
Southland	20,900	..
Totals	90,837	211,747

MINOR TRIANGULATION.

An area of 70,860 acres, at an average cost of 1.1d. per acre, was completed during the year to control settlement surveys in Auckland, Hawke's Bay, Nelson, and Otago Districts.

SETTLEMENT SURVEYS.

The settlement surveys comprise Crown land, land for settlements, and land for discharged soldiers. The bulk appears in Table A under the head of "Rural," the acreage shown being 90,837 acres, while the remainder includes village and suburban and town lands, totalling 2,237 acres.

NATIVE-LAND SURVEYS.

An area of 211,747 acres was completed by staff and contract surveyors during the year. A reference to Table A shows that of the total area 21,167 acres were surveyed by staff surveyors and 188,580 acres by contract surveyors. The area surveyed in each land district is given in Table B.

GEODETIC TRIANGULATION.

Only one field-party has been engaged on this work during the year, and, notwithstanding an abnormally wet season, satisfactory progress has been made both with the observations and reconnaissance work, including the clearing of the stations of bush and the erection of the signals. The closures obtained by the summation of the angles in each triangle are on the whole within the limits of error determined upon for this class of work; of the twenty-eight triangles closed the average error of the summation of the angles is 1.44". The details of the survey will be published in the "Records of the Survey."

STANDARD SURVEY.

During the year steady progress has been made with the standard surveys. The field-work of Point Chevalier, an extension of the City of Auckland survey, has been completed by Mr. H. M. Kensington, District Surveyor, who has also finished the field-work of several new streets in Grey Lynn, Remuera, and in other parts of Auckland. He has also completed the Hamilton standard survey, together with a large amount of reinstatement and examination of blocks at Auckland and Rotorua.

Mr. Otway, District Surveyor, has completed the preliminary survey of the central area of the City of Invercargill, and has determined the alignment of a large portion of the outer areas.

At New Plymouth Mr. A. C. Haase, surveyor, has determined the alignment of all the streets in the Fitzroy, Westown, and Moturoa suburbs, and has placed in position 130 permanent blocks.

The standard survey of Te Aroha Township is now completed.

The work executed during the year comprised also the capping, adjustment, and reinstatement of blocks in Stratford, Wellington, Dannevirke, Palmerston North, Levin, and Feilding, the particulars of which will be given in the "Records."

TOPOGRAPHICAL SURVEY.

On this survey three field-parties are engaged in the thermal-springs area in the vicinity of Rotorua. The work has been retarded by the high growth of bracken and scrub covering the area under survey, and a wet season. An area of 154,272 acres is now completed. Further details of the work will be given in the "Records."

A fourth field-party was engaged in the Waimea and Motueka Survey District for part of the year under review. An area of 20,480 acres has been mapped, and work will be resumed when the pressure of settlement surveys ceases. The state of the topographical survey proper is shown on the index map appended hereto.

In addition to the above an area of 16,670 acres of sketched topography has been returned for the year in North Auckland, Auckland, and Hawke's Bay, and 52,000 acres in South Westland which was undertaken with a view of preparing a scheme of settlement of Crown land suitable for dairying.

INSPECTIONS.

Inspections of surveys under the Land Transfer Act have been made from time to time in several of the land districts. In most cases the work has been found to be satisfactory; several cases, however, show that sufficient care has not been taken to perform the ground-marking and to ensure the accuracy of measurement required by the Survey Regulations. The question of making more inspections is becoming more pressing each year, in order to ensure that an adequate check is being maintained on the field operations of surveyors in private practice or on contract surveys.

TIDAL SURVEY.

The work for the past year comprised a complete fresh analysis for each of the ports of Auckland, Dunedin, and Lyttelton, and portions of the analysis of New Plymouth and Wellington. The constants derived therefrom, combined with previous determined values, are contained in Table C below.

TABLE C.

Mean Values of the Harmonic Constants for Use in preparing the 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.		Wellington. A ₀ = 2.93 ft.		Westport. A ₀ = 4.77 ft.	
	H.	K.	H.	K.	H.	K.	H.	K.	H.	K.	H.	K.
<i>Short Period.</i>	Ft.	°	Ft.	°	Ft.	°	Ft.	°	Ft.	°	Ft.	°
S1	0.011	31.74	0.010	100.05	0.014	18.04	0.031	29.19	0.002	327.99	0.011	78.04
S2	0.580	268.31	0.502	49.79	0.248	129.20	0.172	142.28	0.101	330.48	0.959	332.22
S4	0.019	331.83	0.009	223.42	0.006	308.72	0.010	203.88	0.004	225.46	0.007	32.75
S6	0.003	41.77	0.006	170.17	0.002	112.14	0.015	342.08	0.004	307.40	0.006	331.21
M1	0.009	144.71	0.011	127.33	0.009	90.26	0.009	72.64	0.005	23.12	0.012	143.08
M2	3.818	206.37	2.858	35.68	2.466	122.25	2.884	124.74	1.608	139.02	3.747	304.43
M3	0.039	199.21	0.011	272.74	0.016	270.28	0.013	143.67	0.019	172.05	0.021	208.15
M4	0.106	124.54	0.088	226.45	0.263	177.33	0.015	82.38	0.041	250.90	0.057	53.90
M6	0.026	314.33	0.086	79.53	0.071	356.97	0.020	64.91	0.012	99.73	0.026	36.82
O1	0.053	145.25	0.113	72.91	0.089	72.09	0.087	62.94	0.103	36.51	0.093	45.98
K1	0.235	169.17	0.058	115.68	0.074	91.32	0.150	82.90	0.082	85.35	0.073	184.39
K2	0.139	256.95	0.134	46.77	0.096	118.44	0.059	106.97	0.046	7.69	0.276	328.04
P1	0.077	163.91	0.023	105.44	0.024	90.54	0.052	106.11	0.032	79.01	0.022	133.91
J1	0.017	185.22	0.006	198.96	0.004	87.62	0.007	145.97	0.009	173.01	0.013	219.25
Q1	0.009	67.58	0.031	47.70	0.029	72.89	0.021	48.20	0.037	20.69	0.037	33.03
L2	0.108	219.79	0.109	32.44	0.151	104.17	0.084	162.36	0.028	149.18	0.097	285.41
N2	0.793	179.27	0.654	16.50	0.532	104.05	0.669	94.81	0.402	104.71	0.770	289.02
V2	0.203	206.34	0.153	53.35	0.107	109.14	0.161	109.32	0.124	126.10	0.194	320.40
U2	0.102	178.49	0.065	7.93	0.029	46.15	0.097	59.03	0.065	89.62	0.134	283.83
T2	0.057	294.82	0.020	89.11	0.017	242.34	0.026	228.18	0.029	274.37	0.053	9.08
(MS) ⁴	0.173	195.31	0.081	2.78	0.108	140.60	0.102	120.36	0.035	134.93	0.105	294.78
(2SM) ²	0.066	303.10	0.045	121.63	0.043	9.00	0.060	24.94	0.032	355.14	0.076	199.89
R2	0.015	211.16	0.014	111.90	0.019	220.38	0.017	143.74	0.010	116.63	0.035	178.80
<i>Long Period.</i>												
Mm	0.045	195.02	0.043	1.94	0.053	156.15	0.045	127.51	0.030	197.55	0.051	199.18
Mf	0.050	206.01	0.067	235.36	0.068	216.83	0.055	167.35	0.029	187.39	0.055	7.87
MSf	0.035	209.57	0.063	326.77	0.072	151.90	0.112	145.93	0.042	98.83	0.069	98.39
Sa	0.186	30.61	0.089	16.98	0.130	281.13	0.117	272.08	0.092	343.71	0.113	81.51
Ssa	0.071	164.94	0.115	82.05	0.067	124.63	0.107	143.78	0.078	133.80	0.116	111.03

The tide-tables for the year 1926 of the six New Zealand ports (Auckland, Wellington, Lyttelton, Dunedin, Bluff, and Westport) for which tidal predictions are published were received in Wellington on the 8th July, 1924, from the Hydrographer to the Admiralty. The work of measuring the times and heights of high and low water was performed at the Tidal Institute, University of Liverpool.

The cost of preparing the tidal predictions by the Tidal Institute permits the inclusion of another New Zealand port, for which a tide-table can be prepared on the present annual vote. The port of New Plymouth was therefore recommended, and approved by the Marine Department, and tidal predictions for that port will be given in future for 1928 and onwards. Details of the tidal work will be given in the "Records."

MAGNETIC OBSERVATORY.

The work of the Magnetic Observatory at Christchurch and the substation at Amberley has been efficiently carried on during the year by the Director, Mr. H. F. Skey, B.Sc.

The magnetographs have continued in regular operation throughout the year, and the base values of the curves were determined by absolute observation of declination, dip, and horizontal force, usually taken once a month.

The mean annual values of the magnetic elements as far as they are available are given in Table D following:—

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 Report.
	° ' "	' "	C.G.S. Unit.	γ	C.G.S. Unit.	γ	° ' "	' "	
1902 ..	16 15.1	+3.2	0.22694	-25	0.55277	+9	67 40.80	+1.50	1912-13
1903 ..	16 18.3	+3.5	0.22669	-25	0.55286	+21	67 42.30	+1.80	1912-13
1904 ..	16 21.8	+3.6	0.22644	-16	0.55307	+41	67 44.10	+1.70	1912-13
1905 ..	16 25.4	+2.4	0.22628	-23	0.55348	+28	67 45.80	+1.80	1919-20
1906 ..	..	..	..	..	..	..	..	..	..
1907 ..	16 31.1	..	..	..	..	..	..	..	..
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	†1923-24
1924 ..	17 16.4	..	0.22188	..	0.55508	..	68 17.73	..	†1924-25

* Mean hourly values published in *New Zealand Journal of Science and Technology*.

† Special publication.

Owing to the pressure of the current work of the Observatory, it was not possible to measure the records of the curves of the magnetic elements for the years 1906-9, which are in arrears; a special effort will, however, be made to overtake all arrears during the next two years.

The annual report of the Director, containing a list of the earthquakes recorded at Christchurch, tables of hourly values of the declination and horizontal force for 1924, Vector diagrams for the seasons, monthly and annual curves of declination and horizontal force, will appear in Volume 2 of the "Records of the Survey."

GEOGRAPHIC BOARD.

A Geographic Board was appointed provisionally to deal with the questions of the correct spelling of Maori and geographical names, the changing of alien names appearing on the official maps to British or Native ones, and the investigation of the priority of the discovery of any geographical feature. The members of the Board (Ven. Archdeacon Williams, Gisborne; Hon. Sir Frederick Chapman, Messrs. Elsdon Best, Crompton Smith, J. C. Andersen, and the Surveyor-General, Wellington) are well-known authorities in such matters. A preliminary meeting was held in the Government Buildings last September. Rules of nomenclature were submitted, and resolutions were unanimously passed recommending that the small lake on Pigeon Island be christened the "Arethusa Pool"; the peak that dominates it be named "Tyrwhitt Peak," and that Pigeon Island be renamed "Harwich Island," in honour of Rear-Admiral Sir Reginald Tyrwhitt, who commanded the Harwich Force during the late war, and whose first flagship in that force was the "Arethusa."

The members of the Board present at the above meeting were Sir Frederick Chapman (presiding), Messrs. J. C. Andersen, M. Crompton Smith, and the Surveyor-General.

The constitution, functions, and personnel of the Board are defined in the Survey Bill which it is anticipated will be ready for next session of Parliament. Further particulars of the first meeting will appear in the "Records."

OFFICE-WORK.

Brief reports of the work carried out during the year under review in the district offices administered by the Chief Surveyors are summarized in Table 5 appended hereto, and the state of the map-publication and the work performed at the Head Office is contained in Appendix I, Report by H. E. Walshe, Chief Draughtsman.

PROPOSED OPERATIONS FOR THE YEAR 1925-26.

Geodetic Triangulation.—This work is being executed by Mr. H. M. Ross, who will continue observing the stations of the scheme on which signals have been erected in the northern portion of the Gisborne Land District.

Standard Surveys.—The proposed work for the year comprised the surveys of Whangarei, New Plymouth, Blenheim, and Invercargill by Messrs. Kensington, Haase, Clapperton, and Otway

respectively. Rural standard traverses will be resumed in the vicinity of Christchurch and in the Clutha district during periods of slackness in the settlement surveys, and in addition there is likely to be a certain amount of reinstatement requiring attention.

Settlement Surveys.—The proposed work in each land district is shown in Table 4 appended hereto, and may be summarized as follows: 50 square miles of minor triangulation; 7 square miles of topographical survey for selection; 198,453 acres rural survey; 261,951 acres Native land survey; 92 miles road survey; and 208 acres town survey.

Topographical Survey.—One field-party will continue the survey of the area in Nelson District over which the officers of the Cawthron Institute are conducting a detail soil survey, during periods of slackness in the settlement work, and three parties will be continuously engaged in prosecuting the survey of the thermal-springs region in the vicinity of Rotorua, and the settled pumice land adjoining which will be the subject of a soil survey by the Agricultural Department.

Miscellaneous.—In addition to the above-mentioned works, there is the customary examination and recording of plans, the inspection of surveys, the compilation and drawing of maps for publication, the work of computing the harmonic constants for the tidal predictions, the computation of the primary triangulation, and the preparation of various tables.

The preparation of models, maps, and pamphlets illustrating the works carried out by the Department will be undertaken for exhibit in the Dunedin and South Seas Exhibition. Various instruments, survey marks, and trig. signals as used on the survey will also be exhibited.

GENERAL.

Map-publication.—There was an improvement in the output of maps received from the Printing Department, due to a draughtsman being transferred from this Department to assist in the drawing on the lithographic stones at the Printing Department. The demands of the public and the State Departments are, however, not yet fully met, and it will be necessary to arrange for the printing of several of the survey district maps by private firms.

Proclamation of Roads, &c.—During the past year nineteen applications for the proclamation of road-lines laid off by the Native Land Court under sections 48, 49, 50, and 52 of the Native Land Amendment Act, 1913, were dealt with. The statutory notices were duly served on the local authorities of the districts concerned in terms of section 15 of the Native Land Amendment Act, 1914, and in the large majority of cases no objections were raised to the proclamation of the road-lines as public highways. The machinery provided by these Acts is proving very useful in providing ways and means for the laying-off and legalizing of roads to give access to Native and other lands hitherto without road facilities.

Under the Land for Settlements Act, 1908 (section 80), six Proclamations were issued closing old unformed and unused road-lines intersecting estates 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 241 warrants for the issue of certificates of title were examined and certified to in terms of section 13 of the Act. An application to bring land under this Act affecting a property in the Nelson District for which no Crown grant had been issued was examined and approved in terms of section 19 of the Act. To establish evidence of rightful ownership a search was required of the records of the New Zealand Land Company, and this was successfully carried out with the help and co-operation of the Internal Affairs Department.

International Geodetic and Geophysical Union.—A meeting of Congress was held at Madrid on the 1st October last. The New Zealand Government received an invitation to send a delegate representing the Dominion to take part in the Congress. Circumstances, however, prevented attendance from New Zealand at the meeting.

An important decision was arrived at by the Executive Committee in adopting an international ellipsoid of reference. The Hayford ellipsoid, of which the measures are—Compression, 1/297; semi-major axis, 6378388 metres; semi-minor axis, 6356909 metres—was adopted, and will now be used for the purposes of the geodetic survey within the Dominion. I may remark that the compression of 1/297 has been used by this Department in the computation of geodetic tables since 1920.

Records of the Survey of New Zealand.—The first volume of this publication has been issued, and Volume 2, containing supplementary information to this report, is in course of preparation.

Town Subdivisional Schemes.—The number of town schemes received during the year has been maintained; 315 plans of subdivisions and resubdivision have been dealt with and approved. The greater part of the area subdivided is in the vicinity of Auckland City.

Orakei Garden Suburb.—A subdivisional scheme of this block, which contains about 680 acres, was prepared in 1920 by Mr. J. Dawson, C.E., of Auckland. The survey, however, was not gone on with, partly on account of certain Native interests in the block not having been acquired by the Crown, and partly on account of the natural situation of the area, which is such as to warrant calling for competitive designs for a layout on modern town-planning lines. Towards the end of the year the Government invited designs from residents of the Dominion for the laying-out of Orakei Block as a garden suburb, and offered three premiums of £250, £125, and £75 for the designs placed first, second, and third respectively in accordance with the conditions of competition. Information for the guidance of intending competitors was prepared and issued, comprising historical notes, conditions of competition, requirements, statistics relating to meteorology and climatology, and description of the boundary, two contour maps on a scale of 5 chains to an inch, and a map of part of the City of Auckland on a scale of 20 chains to an inch. A Board consisting of the Engineer-in-Chief, Government Architect, Chief Surveyor (North Auckland), City Engineer of Auckland, and the Surveyor-General was appointed to judge the designs. The closing date of the competition is the 30th May, 1925.

Desiderata.—As in former reports, the question of a suitable site to compare tapes and to house and erect the comparator and standard bar is reiterated. A repeat survey of the magnetic elements should be undertaken, particularly at the more important seaports.

STAFF.

Retirements.—Mr. W. Laing, Land Transfer Draughtsman, New Plymouth, retired on superannuation on the 31st March last, after completing twenty-eight and a half years service. Mr. Laing conducted a number of surveys in Taranaki for the Crown, particularly in the Tongaporotu, Whangamomona, and Waitotara valleys. He explored and graded a number of roads through bush areas in these localities, and has left a permanent record of his work in the Department as a pioneer surveyor in connection with this subdivision and roading. On the 6th October, 1909, Mr. Laing was appointed a District Surveyor. He joined the office staff as a computer in 1914, and was promoted to the position of Land Transfer Draughtsman in October, 1921. His retirement from the service is a loss to the Department, and he proved himself a capable and efficient computer and draughtsman.

Mr. William Arnsby Styche, Draughtsman and Computer, Nelson, retired on superannuation in October last after forty-seven years' service, twenty-two years of which were spent in the Christchurch Office and twenty-five years in Nelson. Mr. Styche was one of the old school of expert lithographic draughtsmen whose work placed the mapping of the Department on a high level of excellence. He was recognized as a conscientious officer of the utmost integrity of character.

Mr. Thomas Carroll joined the Department as a surveyor in November, 1899. He was appointed Assistant Road Surveyor in April, 1901, and was transferred to the Lands Department in September, 1909. At the date of his voluntary retirement he was stationed in the Auckland District, with headquarters at Te Kuiti.

Appointments, Transfers, &c.—Twenty-four draughting cadets have been appointed during the year under report; nine have been transferred from the clerical staff and three from other Departments, as against three transferred to other Departments and one to the Clerical staff. One draughtsman has been appointed to the permanent staff, and one transferred to the printing Department. Seven field cadets were appointed surveyors on passing the Survey Examination, and will be employed in the office until their services are required in the field.

Mr. H. E. Walshe, Senior Draughtsman, Head Office, was promoted to the position of Chief Draughtsman; Mr. C. G. S. Ellis, Draughtsman, Wellington, to Computer at the Head Office; and Mr. W. M. Atkinson was promoted from Gisborne to be Land Transfer Draughtsman at New Plymouth.

The following surveyors were transferred to cope with the demand for surveys: Messrs. H. A. Adams, Auckland to Christchurch; T. G. Phillips, Wellington to Dunedin; T. R. Burt, Auckland to Gisborne; and Survey cadet T. S. Little, Auckland to Invercargill.

Obituary.—Mr. S. T. Burton served as an articled pupil with the late Mr. G. M. Barr, C.E., of Dunedin, and afterwards had further experience on the late District Surveyor Langmuir's party at Otakau Native Reserve, and with Mr. Neill on settlements surveys in the Oamaru district. He joined the Department as a licensed surveyor in June, 1904, and was first stationed in the Westland District. He was transferred to Otago in 1908, and was there engaged principally on settlement and subdivisional surveys. He was an officer with an excellent record and a promising future, and his sudden death was a shock to all his departmental friends.

Mr. A. H. Saunders joined the Department as a draughting cadet in Dunedin in September, 1895. For health reasons he was transferred to the Standard Survey Branch in Auckland, in April, 1909, and rendered excellent service there. Although suffering from physical disabilities and not enjoying good health, it was apparent early in his career that he would make an excellent draughtsman. He was always a willing, conscientious, and reliable officer with a thorough knowledge of his work.

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.

Table 1.—RETURN OF FIELD-WORK EXECUTED BY HEAD OFFICE STAFF FROM 1ST APRIL, 1924, TO 31ST MARCH, 1925.

Land District.	Standard Surveys.				Geodetic Triangulation.				Other Work Cost.
	Completed.		In Progress.		Completed.		In Progress.		
	Miles.	Cost.	Miles.	Cost.	Square Miles.	Cost.	Square Miles.	Cost.	
North Auckland ..	24	£ s. d. 1,179 4 6	..	£ s. d. 105 6 0	..	..	..	..	£ s. d. 718 10 11
Auckland
Gisborne	7,200	3,775 8 0	..
Taranaki	1,545 5 2	..	..	..	..	..
Southland	1,792 16 7	..	..	..	..	..

Table 2.—RETURN OF FIELD-WORK EXECUTED BY THE STAFF AND CONTRACT SURVEYORS ON LANDS ADMINISTERED BY LANDS AND SURVEY DEPARTMENT, FROM 1ST APRIL, 1924, TO 31ST MARCH, 1925.

Land District.	Minor Triangulations.			Topographical Survey.			Rural.			Village and Suburban.			Town Section Survey.			Roads, Railways, and Water-races.			Other Work.		Total Cost of Completed Work.		
	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost of Sections.	Total Cost.	Miles.	Cost per Mile.	Total Cost.	Cost.	Cost.			
																						£ s. d.	£ s. d.
N. Auckland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Auckland	9,660	0.96	38 12 2	6,200	4.94	127 14 0	10,936	3.17	1,732 10 11	530	32	13.62	361 2 2	31.4	90	1.68	151 4 0	21.4	36.93	753 9 6	1,289 13 7	4,415 14 2	
Gisborne	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hawke's Bay	55,000	0.87	200 0 0	1,470	15.00	91 18 0	11,187	2.89	171 14 3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Taranaki	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wellington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Marlborough	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nelson	3,000	2.72	34 0 0	20,480	7.90	674 11 5	2,284	1.88	215 11 7	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Westland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Canterbury	3,200	4.35	58 0 0	52,800	4.11	904 5 8	5,158	1.07	276 2 8	34	3	120.00	18 0 0	..	..	..	..	..	..	..	..	..	..
Otago	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Southland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	70,860	1.12	330 12 2	89,950	4.90	1,838 9 1	90,778	2.46	11,175 6 11	2,035	141	13.64	1,388 2 4	202.1	631	2.63	1,659 3 9	132.1	32.91	4,348 1 9	4,748 3 2	27,300 4 2	

Table 3.—RETURN OF FIELD-WORK EXECUTED BY THE STAFF AND CONTRACT SURVEYORS OF LANDS ADMINISTERED BY OTHER DEPARTMENTS, FROM 1ST APRIL, 1924, TO 31ST MARCH, 1925.

Land District.	Rural.			Town Section Survey.			Native Land Survey.			Roads, Railways, and Water-races.			Other Work.	
	Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	No of Secs. or Divs.	Cost per Acre.	Total Cost.	Miles.	Cost per Mile.	Total Cost.	Cost.	Cost.
North Auckland
Auckland	59	3.05	9 0 0	0.2	1	9.0	107	2.61	785 19 10	1.5	18.67	28 0 0	5 17 0	
Gisborne	286	2.85	12,145 2 7	..	..	..	..
Hawke's Bay	105	2.67	1,168 3 2	..	..	..	7 0 0	
Taranaki	97	1.95	4,192 0 0	..	..	..	..
Wellington	99	1.82	1,072 5 5	..	..	..	67 9 7	
Marlborough	165	1.59	2,953 17 7	..	..	..	..
Nelson	7	7.79	57 10 0	..	..	..	72 8 4	
Canterbury	2	9.40	34 6 6	..	..	..	..
Otago	25	4.62	199 17 0	..	..	..	..
Southland	19	11.01	220 4 8	..	..	..	..
Totals	59	3.05	9 0 0	0.3	3	7.20	916	2.16	22,909 14 2	1.5	18.67	28 0 0	152 14 11	

Table 4.—RETURN SHOWING SURVEYORS EMPLOYED AND WORK ON HAND ON 1ST APRIL, 1925

Chief Surveyors.	Surveyors employed.		District.	Work on Hand.						
	Staff.	Contract.		Trig.	Topo.	Settlement.	Native Blocks, &c.	Roads, &c.	Towns.	Standard Traverse.
H. J. Lowe ..	4	..	N. Auckland	Sq. Miles.	Sq. Miles.	Acres.	Acres.	Miles.	Acres.	Miles.
W. F. Marsh ..	8	13	Auckland ..	..	1,100	19,625	137,778	9.4	35.5	..
V. I. Blake ..	2	..	Gisborne ..	..	..	14,400	102,000	9.0	..	..
J. D. Thomson ..	..	2	Hawke's Bay	..	..	..	2,090	..	..	..
J. Cook ..	2	2	Taranaki ..	..	..	12,290	775	1.0	..	..
T. Brook ..	1	12	Wellington	..	..	885	19,000	..	..	..
J. Stevenson ..	1	..	Marlborough	..	..	..	..	..	25.0	16
N. C. Kensington	1	..	Nelson ..	..	..	12,928	..	8.0	..	..
W. T. Morpeth ..	2	..	Westland ..	..	7	1,880	..	9.0	20.0	..
G. H. Bullard ..	..	7	Canterbury	..	..	..	113	..	..	..
R. S. Galbraith	3	..	Otago ..	50	..	79,500	67	2.8	13.0	..
K. M. Graham	3	1	Southland ..	..	..	20,900	128	..	..	10
Head Office ..	3	..		7,200	..	..	..	..	..	40
Totals ..	30	37	..	7,250	1,107	198,453	261,951	91.7	208.5	66

Table 5.—PRINCIPAL CLASSES OF OFFICE-WORK DONE FROM 1ST APRIL, 1924, TO 31ST MARCH, 1925.

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 Transfer.		Crown.	Native.	Land Transfer.	Other Departments.	Standard Publications.	Sale Plans.	
	Leases, &c.	Free-hold.										
North Auckland ..	479	491	264	10,317	5,754	76	40	673	112	2	109	£ 139 4 11
Auckland ..	804	308	1,408			800	201	156	964	..	7	16	131 16 11
Gisborne ..	40	..	657	744	12	59	56	21	1	9	25 7 5	
Hawke's Bay ..	35	112	209	1,198	827	12	33	118	31	2	18	40 19 3
Taranaki ..	355	108	100	1,095	1,714	12	74	149	68	..	9	50 4 0
Wellington ..	252	394	554	5,689	5,122	15	88	457	102	..	24	67 4 0
Marlborough ..	82	16	10	232	£ 66	31	8	28	22	..	6	38 12 3
Nelson ..	301	71	4	231	756	31	2	87	13	8	35	34 4 0
Westland ..	188	19	..	204	£ 20	32	..	28	18	..	3	14 11 9
Canterbury ..	214	148	70	4,548	3,017	20	13	442	22	..	1	97 6 5
Otago ..	458	158	26	1,692	428	53	6	87	33	15	15	82 3 0
Southland ..	206	86	8	1,013	..	2	2	111	7	1	11	87 18 11
Head Office ..	..	..	..	..	..	..	..	..	..	27	..	331 1 5
Totals ..	3,414	1,911	3,310	26,963	18,504	497	481	3,200	449	63	256	1,140 14 3

APPENDIX I.

HEAD OFFICE, DRAUGHTING BRANCH.

REPORT BY H. E. WALSHE, CHIEF DRAUGHTSMAN.

Map-publication.—During the year a total of 133 maps were printed at a cost of £1,732. The large increase in the cost is almost entirely due to a new system of accounting in the Printing Office, and which has had the effect of increasing the printing-costs at least 25 per cent. The maps printed are comprised of fourteen large-scale town maps, thirteen ½-mile-to-1-in. maps, eighty-eight 1-mile-to-1-in. maps, five 4-miles-to-1-inch territorial sheet series maps, and thirteen miscellaneous maps. The number of standard maps printed this year shows an increase of about 50 per cent. on those printed last year, but it is still below the number required to keep all the standard maps in stock and reasonably up-to-date.

The cash sales of maps amounted to £990, an increase of £120 on the previous year. Other Government Departments were supplied with maps valued at £467—about the average for a normal year.

Among the miscellaneous maps were three issued in connection with the Orakei town-planning competition, giving the data necessary for the competitors to design their schemes, and a general map of New Zealand on 25 miles to 1 inch, showing the altitudes in layer tints.

The new series of 4-miles territorial maps are now in hand, four having been printed during the year and two more partly drawn.

Town Plans.—The number of schemes submitted for approval shows a slight increase this year, 315 having been approved. Of these the greater part represent subdivisions in the North Auckland Land District, 64 per cent. being received from there, while Wellington, Auckland, and Canterbury Land Districts returned 13 per cent., 10 per cent., and 4 per cent. respectively.

Draughtsmen's Examination.—As a number of candidates for this examination had to complete in one subject only (plans), a special examination was held for this purpose only. The candidates—Messrs. C. T. Brown and C. G. D. Maher—completed the first grade, and seven—Miss N. Earle, Messrs. J. Pegram, W. G. Neal, G. T. Stewart, H. M. Smith, E. W. Pickford, and W. Conway—completed second-grade passes. No candidates presented themselves for examination as computers.

Standard of Length.—The comparison of surveyors' bands, both field and standard, is regularly carried out, though under difficulties. The standard comparator-bar obtained in 1913 is still unhoused, and consequently cannot be used. The level wooden curb which has been in use for running out the standard band and that to be tested is now out of use owing to alterations to the buildings. In consequence of this a considerable amount of extra trouble is entailed in preparing a surface each time a band has to be tested.

APPENDIX II.

SURVEYORS BOARD.

THE personnel of the Board, 1924 - 25, remained unchanged at the end of the Board's year (31st November, 1924), and is as follows: The Surveyor-General, Mr. W. T. Neill (*ex officio*, Chairman); Messrs. Thomas Brook and G. H. Bullard, Chief Surveyors (Government nominees); and Messrs. S. T. Seddon and A. H. Bogle (Institute nominees).

The Board held the usual examinations in September, 1924, and March, 1925, the papers for the former being set by Tasmania and for the latter by Victoria.

For the September examination forty-seven candidates sat, being the largest number yet sitting at once. Seventeen of these passed. For the March examination a new rule of the Board's was in force to the effect that only those candidates partially failing at a previous examination would be allowed to sit in March, no new candidates being accepted for that examination. Twenty-one candidates sat under these conditions, of whom four passed. The new rule was intended to reduce the expenses of examination, and had that effect, the cost being less than half the usual full examination. The names of those passing these two examinations were as follows:—

September, 1924—

Beattie, Stanley James, of Auckland.
 Borlase, William, of Dunedin.
 Buckhurst, Wilfrid Henry Blyth, of Christ-
 church.
 Burrell, Vincent George Braithwaite, of
 Auckland.
 Crooks, Robert George Bell, of Auckland.
 Greig, David Masson, of Waikiwi.
 Horner, Robert Brian, of Carterton.
 Hosking, James Dargaville, of Dargaville.

Lawn, Charles Arnold, of Christchurch.
 Lambourne, James Ernest Kerr, of Dunedin.
 Mynott, William Lambert, of Auckland.
 Nelson, William George, of Wellington.
 Paxton, Marmaduke St. John, of Auckland.
 Runciman, Thomas McKinlay, of Waikato.
 Stewart, Ernest Victor, of Takaka.
 Wattie, Angus John, of Auckland.
 Watkin, Alan Keith, of Auckland.

March, 1925—

Adams, Alfgar Vivian, of Hokitika.
 Batty, Cyril Howard, of Auckland.

Murphy, Vernon Alan, of Hamilton.
 Wilson, Raymond, of Auckland.

Licenses have been issued to all these gentlemen. Forty-three pupils lodged indentures for registration during the year, which were approved; and four existing registered indentures were cancelled. Four transfers were approved.

During the year the Board considered the amendments to the Survey Regulations asked for by the Institute of Surveyors, and a considerable amount of time was spent upon them. A final decision was arrived at, and the amendments were approved, and have since been gazetted.

The work of redrafting the examination regulations to embody various amendments made from time to time, and also to embody the results of the Melbourne Conference, is in hand, but is not completed.

The request made by the Board to the University Senate for the inclusion of a paper in the Matriculation Examination suitable to the Board's requirements for a preliminary mathematical pass has not yet been decided. The matter of a degree in surveying has also been laid by the Board before the University.

The work of the Board has shown a steady growth, chiefly, no doubt, owing to the increasing number of students, and also largely due to the large general questions which have required consideration as indicated above.

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

Approximate Cost of Paper.—Preparation, not given; printing (775 copies), £15.