1949

NEW ZEALAND

DEPARTMENT OF LANDS AND SURVEY

SURVEYS

(ANNUAL REPORT ON)

Presented to Both Houses of the General Assembly by Command of His Excellency

Wellington, 15th July, 1949.

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

SIR,—

I have the honour to present herewith my report on the survey operations of the Department for the year ending 31st March, 1949.

I have, &c.,

R. G. DICK,

Surveyor-General.

The Hon. Minister of Lands.

REPORT

THE returns for the year reveal that there has been a still greater output of work than in any previous year. It is encouraging to note that arrears in certain classes of work are gradually being overtaken while at the same time staff are being diverted to other urgent and essential tasks

Although there has been no numerical increase in the office staff, the Department is reaping the benefit of the training of ex-servicemen, who are in most cases now fully competent to undertake more responsible work. Reference will be made later in the report to the very successful system of staff training adopted by the Department which is equipping trainees to efficiently carry out the many specialized duties of a survey office.

There has also been an increase in the output of field survey work. A slight increase in the field survey staff, the wider experience of survey cadets in training, and the extended employment of contract surveyors has enabled the Department to undertake other vital and urgent survey works such as topographical mapping and precise levelling. The position in regard to field staff is, however, far from satisfactory. Many urgent survey requirements are still held in abeyance, to the future detriment of national development and production. Attention is drawn to a summary of these needs at the end of this report.

ROUTINE ACTIVITIES

The following schedule summarizes the field-work carried out by staff and contract surveyors for the year ended 31st March, 1949:—

SUMMARY OF FIELD-WORK

Class of Survey.	Area or Mileage, &c.	Average Cost.	Total Cost.
			£
Geodetic triangulation	(Longitude observations)		1,424
Second and third order triangulation			3,447
Topographical mapping (1 : 63360)	573 square miles	25s. per square mile	716
Topographical survey for settlement	196,698 acres	5·68d. per acre	4,656
Topographical survey for housing	28 acres	24·28s. per acre	34
Rural and settlement surveys	172,461 acres	2·45s. per acre	21,140
Village and suburban surveys	387 acres	104·39s. per acre	2,020
Town and housing section surveys	3,506 lots	£4·29 per lot	15,035
Maori land surveys	2,140 acres	14·09s. per acre	1,508
Road and railway surveys	83·8 miles	£65·23 per mile	5,466
Standard traverse surveys			
Precise levelling (first order)			2,537
Maintenance of survey marks			760
Inspection and investigation surveys			1,733
Location of boundaries and compass surveys			914
Police surveys and Court attendance			166
Town and extra-urban planning			786
Miscellaneous (reports, &c.)			4,203
Total cost			66,545

The three major items of expenditure with the relative output for the past three years are as follows:—

—	1947.	1948.	1949.
	Acres.	Acres.	Acres.
(i) Topographical survey for settlement	192,563	227,639	196,698
(ii) Rural and settlement survey	90,308	132,271	172,461
	Lots.	Lots.	Lots.
(iii) Town and housing section survey	1,614	2,149	3,506

Except for a slight decrease in the return of topographical surveys this year, these items show a steady increase in output. These surveys comprise 60 per cent. of the field operations carried out during the year.

The expenditure listed under the heading "Topographical mapping (1 : 63360)" comprises mapping completed during the war period, costs of which have been brought forward on the publication of the map sheets concerned.

The summary once again reveals the fact that vital and urgent survey works are still held in abeyance. Reference will be made later in the report to the triangulation, topographical mapping, and precise levelling operations.

SURVEYS FOR LAND-SETTLEMENT FOR YEAR ENDED 31ST MARCH, 1949

District.	Chief Surveyor.	Preliminary Topographical Surveys.	Final Land Title Surveys.	Number of Units.
North Auckland and South Auckland	W. Traill.. ..	24,131	19,920	197
Gisborne	C. L. Cox ..	7,021	27,418	36
Hawkes Bay	A. J. Wattie ..	16,310	18,988	62
Taranaki	J. S. Strawbridge ..	1,986	2,894	16
Wellington	T. S. Roe ..	29,269	28,368	69
Marlborough	W. Watson ..	8,193	21,585	12
Nelson	J. W. McIntyre ..	152	62	3
Westland	E. M. Morilleau ..	..	..	..
Canterbury	T. S. McMillan ..	86,794	18,849	15
Otago	H. A. Adams ..	10,501	10,968	19
Southland	H. M. Smith ..	12,341	7,281	18
		196,698	156,333	447
Totals—				
1948	..	227,631	98,492	305
1947	..	141,312	61,209	219

This table sets out the areas dealt with in each district for solely land-settlement purposes. It represents the actual area of land surveyed for these purposes and does not include land units settled which have not required survey.

The increase in the area finally surveyed and the number of units show a large increase on the previous year. It is anticipated that an equal or greater rate of output will be maintained during the coming year. It is intended to utilize the services of contract surveyors on this work to a greater extent in the future, thus releasing staff surveyors for other urgent work.

COST OF SURVEY WORK APPORTIONED TO THE VARIOUS DISTRICTS

District.	By Staff Surveyors.	By Contract Surveyors.	Totals.	Percentage.	Number of Surveyors.	
					Staff.	Contract.
	£	£	£			
Head Office ..	3,966	..	3,966	6·0	2	..
North Auckland and South Auckland	10,421	7,939	18,360	27·5	10	34
Gisborne ..	2,604	..	2,604	3·9	2	..
Hawkes Bay ..	4,091	417	4,508	6·8	3	3
Taranaki ..	2,686	667	3,353	5·0	2	2
Wellington ..	6,367	8,280	14,647	22·0	5	17
Marlborough ..	2,516	394	2,910	4·4	1	2
Nelson	1,778	29	1,807	2·8	1	1
Westland ..	208	..	208	0·3	..	1
Canterbury ..	6,454	1,067	7,521	11·3	3	4
Otago	2,744	1,565	4,309	6·5	3	5
Southland ..	2,352	..	2,352	3·5	..	..
Totals ..	46,187 (44,065)	20,358 (13,002)	66,545 (57,067)	100·0	32 (26)	69 (71)

(Last year's figures are shown in parentheses.)

It is noted that the Wellington district has had more than 50 per cent of its survey work carried out under contract to private practising surveyors. In all, 200 contracts have been issued during the year, as against 87 in the previous year. Most of these contracts relate to housing and Maori land surveys, Wellington being the only district which has issued contracts for settlement surveys. The sum expended on contract surveys has increased from £13,002 to £20,358.

The expenditure by Head Office represents the cost of precise levelling (Rimutaka and Waikato River), geodetic triangulation (longitude observations) and second and third order triangulation in Southland and Rotorua districts.

FIELD-WORK IN HAND

The following is a summary of the major survey operations which are at present either in hand or under action. It does not include the estimated future survey requirements, many of great urgency, which cannot be undertaken until more field personnel are available:—

(1)	Geodetic triangulation	Longitude observations.
(2)	Second and third order triangulation (Rotorua and Taupo district)	2,000 square miles.
(3)	Standard traverses (Rotorua and Taupo district) ..	100 miles.
(4)	Precise levelling—	
	Bay of Plenty - Rotorua .. ..100 miles	
	Hutt Valley and Wanganui .. .. 60 miles	
	Canterbury .. .. 7 miles	
		167 miles.
(5)	Topographical mapping (1 : 25,000 + 1 : 63,360), (Rotorua-Taupo district)	2,000 square miles.
(6)	Topographical surveys for settlement	42,000 acres.
(7)	Title surveys for settlement	250,000 acres.
(8)	Town and housing sections	4,000 lots.
(9)	Maori land surveys	15,000 acres.
(10)	Road surveys	50 miles.

Most of the survey work of a routine nature under (8), (9), and (10) above as well as a proportion of the work under (7) will be carried out under contract.

A start was made on second and third order triangulation and topographical mapping in the Rotorua-Taupo district during the year, while 100 miles of precise levelling up the Waikato Valley for hydro-electric development was completed. This latter party will be transferred to the Bay of Plenty district during the year to establish datums for drainage and river control development.

The longitude observations required for the final control of the geodetic triangulation, which were held up by adverse weather conditions, will be completed early in the year.

Town Scheme Subdivisions

(Land Subdivision in Counties Act, 1946)

The following table summarizes the number of plans, saleable lots, areas set aside as Crown land and reserve, and cash received in lieu of land dealt with in accordance with the provisions of the above Act for the year ended 31st March, 1949:—

Town Scheme Subdivisions, 1948–49

District.	Number of Plans.	Number of Saleable Lots.	Cash Received in Lieu of Reserves.	Areas Set Aside.		Area: Roads.	Total Area.
				Crown Land.	Reserves.		
			£ s. d.	A. R. P.	A. R. P.	A. R. P.	A. R. P.
North Auckland and South Auckland	314	4,411	5,827 11 0	14 3 35	136 3 26	188 1 32	2,066 2 28
Gisborne	7	25	28 5 0	..	4 0 20	0 0 06	71 1 29
Hawkes Bay ..	18	64	31 8 0	..	..	0 1 31	45 1 13
Taranaki	19	121	513 2 7	..	1 2 08	3 1 33	74 2 26
Wellington	58	697	448 14 10	1 1 11	24 0 06	24 1 10	296 0 33
Marlborough ..	23	254	75 11 0	6 2 36	2 1 05	7 0 37	162 0 29
Nelson	59	257	469 16 6	0 0 32	3 3 20	7 1 25	136 0 19
Westland	9	147	98 12 6	..	7 3 25	4 3 28	52 1 06
Canterbury	123	997	3,875 1 11	5 0 20	9 3 12	24 2 33	479 2 11
Otago	44	527	109 4 1	0 1 25	40 2 13	36 3 10	300 3 37
Southland	16	101	64 19 3	1 0 35	..	3 2 18	41 0 18
Totals ..	690	7,601	11,542 6 8	29 3 34	231 0 15	301 1 23	3,726 2 09
	(538)	(5,815)	(7,095 14 5)	(8 3 33)	(211 0 24)	(218 0 08)	(2,693 3 04)

(Last year's figures are shown in parentheses.)

The further increase in the number of saleable lots dealt with is mainly due to the fact that during the year accumulated arrears in the Auckland districts were reduced to normal conditions.

It has been noticeable that many favourable comments have been received from local authorities in regard to the efficiency of the Act in providing a much-needed control of residential development. Local authorities continue to co-operate to the fullest extent with the Department in the administration of the requirements of the Act.

Steps were taken during the year to delegate power for the approval of subdivisions into six or less allotments to the Chief Surveyor of the district concerned. This has relieved congestion at both district and head offices, thus avoiding unnecessary delays in land transactions.

Approximately 1,000 applications for exemptions from the provision of the Act were received by district offices during the year. These exemptions comprise the subdivision of land into single allotments, generally in isolated localities, and involve the submission of each application to the local authority for approval before exemption can be granted. This creates unnecessary delays and

additional work that is not warranted. It is fully anticipated that local authorities would agree to an amendment to the Act whereby the granting of such exemption is subject only to the approval of the Chief Surveyor.

OFFICE-WORK (PLAN EXAMINATION)

The following table summarizes the number of land-survey plans approved and instruments of title prepared for the year ended 31st March, 1949:—

District.	Plans Placed on Instruments of Title.	Survey Plans Examined and Approved.				
		Crown.	Other Departments.	Maori.	Land Transfer.	Totals.
North Auckland and South Auckland	16,229	193	208	46	1,046	1,493
Gisborne	937	19	..	8	60	87
Hawkes Bay ..	1,883	34	24	10	187	255
Taranaki	1,212	24	46	9	130	209
Wellington	6,242	32	98	15	372	517
Marlborough ..	552	21	14	..	73	108
Nelson	1,676	35	32	..	171	238
Westland	840	13	3	..	21	37
Canterbury	4,796	73	56	3	469	601
Otago	3,151	48	36	..	202	286
Southland	1,171	45	14	..	95	154
Totals ..	38,689 (42,686)	537 (498)	531 (526)	91 (120)	2,826 (2,724)	3,985 (3,868)

(Last year's figures are shown in parentheses.)

There is a slight increase in these returns over the previous year. Arrears have been reduced from 837 to 550, all of which are now confined to the Auckland district. It is hoped to completely eliminate all arrears this coming year when the modified form of plan examination instituted towards the end of the year will become more effective.

OTHER OFFICE-WORK

Except for the most essential routine work, there has been no opportunity during the year of dealing with the huge arrears of record and cadastral map production. This work is fully ten years in arrear, many cadastral maps having to be reprinted without revision.

Now that land-holding maps, illustrating rural land ownerships, have been completed in most districts, it will be possible to undertake more of this work during the ensuing year.

Although it is not possible to summarize the many and various works carried out by the draughting staff, the following summary sets out some of the main classes undertaken (last year's figures in parentheses):—

(1) Record maps revised or redrawn ..	209	(123)
(2) Cadastral maps revised or redrawn ..	55	(41)
(3) Tracings supplied	7,446	(7,000)
(4) Photostats and prints supplied ..	57,504	(54,581)

A new photostat machine has been installed in the Dunedin office, which now means that the four main districts of Auckland, Wellington, Christchurch, and Dunedin are equipped with an efficient means of copying map and plan records for various departmental and public purposes. This facility should be extended to other districts in order to reduce the amount of hand copying-work.

Warrants

During the year 210 (147) warrants for certificates of title comprising 789 (561) items and 15 (8) proclamations of road-lines under the Maori Land Act, 1931, were dealt with (last year's figures are shown in parentheses).

Map Sales

Map sales during the year have not shown any marked improvement. The facilities available—namely, map sales counters in various survey offices—are entirely unsuited and inadequate for the public advertisement and disposal of maps. However, until the map-printing facilities are increased to cope with departmental demands it would be impossible to guarantee sufficient map-supplies to cope with demands that would be made by map sales agencies if established. In addition, it will be some years before the arrears in the drawing of new maps and revisions of existing maps can be brought up to date. The drawings of new map series are in hand, but cannot be expedited because of the demands of routine work.

The following table summarizes map sales for the year ended 31st March, 1949:—

Class of Map.	Sold for Cash or Credit.	Free Issue and Office Use.	Totals.
	£	£	£
Survey districts and counties	970	629	1,599
Towns	564	102	666
Territorial	680	222	902
Topographical	2,435	476	2,911
Miscellaneous	121	63	184
Totals	4,770 (4,202)	1,492 (2,842)	6,262 (7,044)

(Last year's figures are shown in parentheses.)

Summarized Expenditure

The following schedule sets out the salary expenditure of both field and office staff for the year ended 31st March, 1949, apportioned to various classes of field and office works. Relative figures for the previous year are also given:—

	1948–49.	1947–48.
	£	£
General (Crown surveys, records, tracings, investigations, diagrams, and general office-work)	80,755	67,774
Triangulation	6,034	1,958
Topographical mapping	4,209	9,850
Standard traverse	165	91
Survey maintenance	804	627
Precise levelling	2,785	330
Inspection and investigation surveys	1,886	1,215
Town scheme plans	5,647	4,450
Land-settlement (topographical and schemes)	13,854	12,825
Tidal calculations	48	..
Work for—		
Maori Affairs Department	2,499	3,275
Lands and Deeds Department	24,038	23,799
Ministry of Works	5,355	4,636
Housing Division (Works)	3,043	3,445
Other Departments	8,728	7,549
	159,850	141,824

The above expenditure apportioned among the various Chief Surveyors and Head Office is as follows:—

District.	Expenditure.	Percentage.
	£	
Head Office	17,788	11·1
North Auckland and South Auckland ..	45,783	28·6
Gisborne	5,762	3·6
Hawkes Bay	10,554	6·6
Taranaki	8,009	5·0
Wellington	19,756	12·4
Marlborough	5,292	3·3
Nelson	6,062	3·8
Westland	2,303	1·4
Canterbury	19,713	12·4
Otago	12,047	7·5
Southland	6,787	4·3
Totals	159,850	100·0

Specialized Activities

The following sets out brief reports on survey work of specialized nature carried out during the year:—

Geodetic Triangulation

Observations for La Place longitudes at six stations in the North Island and two stations in the South Island were completed during the year. It is anticipated that the observations at the remaining three stations in the South Island will be completed during 1949. This work will finalize all observations for the geodetic triangulation of the Dominion which was commenced in 1911.

Second and Third Order Triangulation

During the year a start has been made in establishing second and third order triangulation in the Rotorua – Taupo – King-country area for the purpose of controlling the topographical mapping of this area, which is required for national development purposes.

Precise Levelling

(*a*) *Rimutaka Tunnel.*—This traverse is required for the purpose of fixing the portals of the proposed Rimutaka Tunnel, and sixteen miles of the twenty-two miles were completed at the end of the year. It is anticipated that the traverse will be completed by June, 1949. This traverse is a portion of the Wellington–Wairarapa geodetic level net, and if staff can be made available this work will be continued during this year.

(*b*) *Waikato River.*—A traverse along the Waikato River from Arapuni to Taupo was started during the year for the control of the hydro-electric works on this river and approximately sixty miles of levelling between Arapuni and Ohakura was completed at the end of the year.

Standard Traverse

With the exception of a few miles in the Gisborne district, no standard-traverse surveys were made during the year. There are many miles of both city and rural standard traverses required in all districts, but, although the work is becoming increasingly urgent, the shortage of staff will not permit this work to be put in hand during 1949.

Topographical Mapping

In the Rotorua–Taupo region a start has been made in mapping the areas required for national development projects. Although it is hoped that urgent requirements will be covered, shortage of staff will delay progress during 1949.

Maps published during the year include some sheets on which work was completed in the previous year. The summary of maps published to date is as follows:—

1 : 25,000 SERIES

—	Area (Square Miles).	Number of Sheets.
Maps published at 31st March, 1948	1,070	35
Maps published during year	58	2
Mapping in hand	1,130	29
	2,258	66

1 : 63,360 SERIES

—	North Island.		South Island.		Total.	
	Area (Square Miles).	Number of Sheets.	Area (Square Miles).	Number of Sheets.	Area (Square Miles).	Number of Sheets.
Published at 31st March, 1948	18,908	73	27,598	87	46,506	160
Published during year ..	300	2	436	1	736	3
Drawings completed ..	500	2	..	..	500	2
Mapping in hand	3,800	15	1,800	5	5,600	20
	23,508	92	29,834	93	53,342	185

Aerial Photography

The services of N.Z. Aerial Mapping, Ltd., Hastings, have been fully employed during the year on the production of aerial photographs for all State Departments. This company still maintains a high standard of production and is now engaged in filling in photographic coverage of more difficult terrain where suitable weather conditions are limited.

During the year the company photographed an area of 7,237 square miles, mostly on a basic scale of 4 in. to 1 mile. Since the company commenced operations under contract in 1939, an area of 52,700 square miles has been covered with vertical aerial photographs.

Mosaic Maps

To make fuller use of existing photography, a start has been made on the production of mosaic maps (N.Z.M.S. 3, 1 : 15,840 and N.Z.M.S. 4, 1 : 25,000). These maps, particularly in areas not covered by topographical maps, will greatly assist in the study of lands for development purposes. During the year 24 sheets have been published, and it is anticipated that 100 sheets will be published in the year 1949–50. These maps are being produced by N.Z. Aerial Mapping, Ltd., under contract to this Department.

New Zealand American Fiordland Expedition, 1949

Inspired by the efforts of Colonel J. K. Howard, representing the Museum of Comparative Zoology, of Harvard University, Boston, United States of America, a combined New Zealand – American scientific expedition entered the area of fiordland in the George Sound and Caswell Sound area. Simultaneous with the initial planning of the above expedition, a request was made to the Lands and Survey Department by the State Hydro-electric Department for accurate topographical information of a large portion of the identical area with which the scientific parties were concerned, and it was decided that a survey party accompany the expedition to map the area. In addition to the primary object of supplying a topographic map to the State Hydro-electric Department, this map will also serve as the best possible reference to supplement the reports of the scientific parties.

A special report on survey operations of this party will be published later.

HEAD OFFICE

As the Department is now the Service and civil mapping agency in New Zealand, the cartographic branches at Head Office have been reorganized to carry out the preparation and distribution of topographical maps, aeronautical charts, index and Service maps, in addition to civil map requirements. This programme has necessitated an increase in staff and the provision of extra accommodation. Arrangements are being made to recruit staff in the United Kingdom, and it is expected that some draughtsmen will arrive during 1949.

Draughting Branch

During the year it has not been possible to meet in full all the demands made upon the draughting staff, but every endeavour has been made to fulfil the most urgent requirements. A start has been made in revising many of our basic drawings, and this work will be accelerated as further staff becomes available and the many calls from other Departments for special drawings are reduced.

(*a*) *Aeronautical Charts*

1. *Approach and Landing Charts.*—Thirteen approach and landing charts showing instrument let-down procedures were published during the year and an additional thirty-five charts are in various stages of preparation.

2. *Radio Facility and Services Charts.*—A start has been made in preparing radio facility and Service charts and seventeen charts are in various stages of preparation.

3. *Aeronautical Charts, I.C.A.O. 1 : 500,000.*—The present published aviation strip map of the Dominion (8 miles to 1 in.) will in the near future be superseded by a new series designed to conform to I.C.A.O. specifications and published on a scale of 1 : 500,000. There will be seven sheets in the series and four sheets are in course of preparation. It is hoped to publish the complete series by the end of 1950.

4. *Aeronautical Plotting Charts, I.C.A.O. 1 : 3,000,000.*—A series of five outline plotting charts for air navigation use in the New Zealand – Australia – Pacific area was started during the year. Two charts have been published and a third chart is in preparation.

(*b*) *Topographical Maps*

1. *1 : 25,000.*—The drawings for six sheets of this series were completed during the year.

2. *1 : 63,360.*—The drawings for two sheets of this series were completed during the year.

3. *1 : 250,000.*—It has been considered desirable to replace the present 4 miles to 1 in. map of New Zealand with a new topographic series at scale 1 : 250,000. There are thirty-one sheets in the series and three sheets are in various stages of preparation.

(*c*) *Other Work*

1. *Maori Social and Advancement Act, 1945.*—A number of descriptions and plans were prepared of tribal districts, but further information is required before the work can be completed.

2. *Hydrological Maps for Soil Conservation Council.*—The basic map for this series has been completed and as soon as the hydrological data is made available the necessary overlay drawings will be prepared.

3. *Miscellaneous Maps.*—A large number of special maps and drawings have been prepared during the year for Service Departments, the Agriculture Department, and the Tourist and Health Resorts Department.

(*d*) *Map Publications*

The table below is a summary of maps published during the year, together with cost of map and chart printing:—

Class of Map.	Number of Sheets Published.	Printing-costs.
		£
Topographic—		
1 : 25,000	2	291
1 : 63,360	3	463
Cadastral—		
Survey districts	47	450
Counties	7	306
Towns	5	316
Aeronautical—		
Approach and landing charts	13	343
Plotting charts	2	
General	15	600
Miscellaneous and index maps	6	273
Totals	100	3,042
Mosaic maps—		
1 : 15,840 (20 chains to an inch)	24	..
1 : 25,000 (32 chains (approximately) to an inch)	24	..
"Fotomaps" (20 chains to an inch)	66	..
Totals	114	..

The mosaic maps are produced under contract by N.Z. Aerial Mapping, Ltd., Hastings. The 1 : 15,840 (20 chains to an inch) is employed for civil requirements, while the 1 : 25,000 series is essentially a scale suitable for Army purposes.

Photogrammetric Branch

The main work of this Branch has been the plotting and contouring of 1 : 25,000 topographical maps. A number of special topographical mapping jobs were also undertaken for other Departments.

During the year one Zeiss Multiplex unit was obtained from Norway and put into operation. A Wild A. 6 plotter was received from Switzerland. This also has been erected and adjusted and has been in use on special mapping projects. The Department has on order for delivery during 1949 two Zeiss Multiplex units from the United States of America and one A. 6 plotter from Switzerland. For some years this Branch has been restricted in its work due to lack of suitable plotting equipment, but the bringing into operation of the above machines should increase output.

(*a*) *Topographical Mapping*

A total of twenty-eight 1 : 25,000 sheets are in hand covering an area of 1,044 square miles. Three sheets were completed during the year.

(*b*) *Special Projects*

1. *State Hydro-electric Department.*—Contour maps of the Manapouri–Doubtful Sound area (17 square miles) and of storage basins on the Waikato River (17 square miles) were compiled during the year.

2. *State Forest Service.*—Timber-type boundaries and planimetry of three 1 : 25,000 sheets totalling 145 square miles were completed.

3. *Lands and Survey Department.*—A special contour map of the Rangitaiki River area was made for flood-control-investigation purposes (13 square miles).

(*c*) *Photo-Library Section*

1. The area covered by new photography was 7,237 square miles at a cost of £19,974, of which £1,392 was for other Departments.

2. A total of 34,798 prints of aerial photographs, of which 11,348 prints were an increase in the Library holding, 302 enlargements, and 232 copies of special mosaics were handled by this Section during the year. The return from sales to other Departments and to the public was £16,349, of which £10,604 was available for credit towards the initial cost of photography. Transactions incomplete at 31st March, 1949, will, on finality, result in further credits in reduction of initial cost of photography.

(*d*) *Photographic Section*

During the year 3,404 contact prints, 645 enlargements, 649 negatives, 74 Gestefilms, 178 diapositives, and 119 pin-up mosaics were made by this Section.

Computing Branch

(*a*) *Geodetic Triangulation*

The first adjustment of the main North Island figure in the first-order triangulation was completed, and that of the other three main figures (one in the North Island, two in the South) was very near completion. The computations of astronomical latitudes were completed for the North Island stations, and a commencement was made with the South Island stations. Observations

for latitude, longitude, and azimuth made at nine La Place stations were received, and work in connection with them was to commence early in the financial year.

The computations in connection with the base-line measurements were completed, and final values for the lengths of the base lines determined.

(*b*) *Tidal Analysis*

Analyses for the port of Bluff for the years 1940 and 1943 were completed and the hourly heights for 1946 measured and tabulated in readiness for analysis. Lack of staff has once more restricted the tidal work, but the position is improving and it is expected that some of the arrears will be overtaken in the coming year.

(*c*) *Photogrammetric Control*

The co-ordinates of the centres of 208 photographs, in 15 runs, were computed from measurements made in the stereocomparator by the Photogrammetric Branch.

(*d*) *Mapping Control*

Charts for the conversion of meridional circuit co-ordinates (in links) to national grid yard co-ordinates were drawn in connection with the mosaic-map programme (N.Z.M.S. 3 and 4). Drawn on scales of 80, 100, or 200 chains to an inch, they covered an area of approximately 16,500 square miles in the North Island and 2,200 square miles in the South Island.

The co-ordinates of sheet corners, latitude and longitude intersections, convergences, and magnetic declinations and variations were supplied for all topographical maps published, and the computation of transverse mercator and conical orthomorphic graticules for aeronautical and small-scale maps was another of the Branch's regular activities.

DRAUGHTING EXAMINATIONS

This year saw the introduction of the new Public Service Draughting Examination. Ninety candidates entered for this examination, while 41 sat for the old Draughting and Computing Examinations.

Passes were obtained as follows:—

Public Service Draughting Examination, November–December, 1948: 16 completed; 28 passed Stage I.

Draughting and Computing Examinations, November, 1948: 7 passed 1st Grade Draughting; 6 passed 2nd Grade Draughting; 9 passed 2nd Grade Computing.

STAFF TRAINING

An organized scheme of staff training for cadets and junior draughtsmen was established in all offices in 1948. The cadet trainees were tested at two points during the year and the results have shown that the instruction given has enabled the juniors to reach a higher standard of workmanship in a shorter time than previously.

The pursuance of this scheme of training will assist materially in overcoming some of the problems created at present by the shortage of senior experienced staff.

NEW ZEALAND GEOGRAPHIC BOARD

The annual meeting of the New Zealand Geographic Board was held on the 9th and 10th September, 1948.

The Board considered 176 place-names submitted from various sources, of which 143 were approved, 18 rejected, and 15 deferred for further consideration.

During the year Mr. J. W. Heenan retired from the Board as representative of the Department of Internal Affairs, and Mr. A. G. Harper was appointed, on the recommendation of the Hon. the Minister of Lands, to fill the vacancy caused thereby. In order to bring the membership of the Board to full strength as provided by the Act, the Minister also recommended the appointment of Mr. A. H. Bogle. The present members of the Board are: Mr. R. G. Dick (Surveyor-General), Chairman; Sir Apirana T. Ngata, Kt., M.A., LL.B.; Messrs. Johannes C. Andersen, M.B.E., K.D., F.R.S.N.Z.; A. P. Harper, B.A.; Pei te H. Jones; A. H. Bogle; and A. G. Harper. Mr. C. S. Wood is official secretary.

NEW ZEALAND SURVEY BOARD

The Survey Board conducted two examinations for the qualification of land surveyors during the year, the results being:—

	September, 1948.	March, 1949.	Totals.
Number of candidates	84	77	161
Passed full examination	7	7	14
Obtained credits in subjects	63	60	123

The number of pupils registered during the year was:—

Lands and Survey Department	13
Private surveyors	32
Total	45

Most of the survey cadets whose training was delayed by war service have practically completed their examinations. There has been an increase in the number of pupils registered during the year. Some benefit is now being derived from the newly qualified surveyors, who are taking up survey work for various agencies throughout the Dominion.

Preparations are being made by the Board for the holding of two conferences in Wellington in November, 1950; the first of the Australian and New Zealand Survey Boards, and the other of British Commonwealth and United States of America survey authorities to discuss reciprocity in the training, examination, and qualification of surveyors.

GENERAL

Although the returns of work for the year show that the available staff has been able to deal with normal routine land-title work, very little has been done on such essential works as cadastral records, standard traverses, topographical mapping, and precise levelling.

All Departments of State and the general public have become map conscious, the topographical map being an essential tool in the hands of the engineer, the scientist, the farmer, the industrialist, and the planner. The existing 1 in. provisional topographical series covering over 50,000 square miles (half of the

Dominion) were developed under war conditions when staff was conscripted from various sources. These maps, which admittedly are not up to normal mapping standards, have, however, proved to be invaluable for many governmental purposes.

The demand for more detailed maps on large scales and the extension of mapping into territory of which little is known is of utmost importance to production in this country. Our potential resources can only be assessed on the basis of accurate and detailed maps, the cost of which is small in comparison with the benefits derived.

At present there is only one small mapping party operating in the Rotorua–Taupo district, where topographical maps are required urgently as a preliminary to the development of unproductive lands in that district. Every effort has been made to increase staff to be diverted to this class of work, with very little success. Newly qualified surveyors who at one time would have been attracted by a career as a surveyor in the Department are able to obtain better prospects and conditions outside the Service. Departmental field staff have also resigned to take up more attractive jobs outside the Service.

In addition to topographical mapping, which also includes the necessary triangulation control, standard survey and precise levelling traverses are required for more adequate survey and engineering control. Huge expenditures on river-control works are entirely dependent on accurate levels co-ordinated with a common datum. The urgent need for these traverses can be substantiated by a number of Departments of State.

The extension of air transport, with the consequent increase in navigational aids and operational procedure, calls for a more detailed knowledge of flying hazards. The accuracy of aeronautical maps and charts are dependent on the extension of topographical surveys, particularly in the environs of airports and airfields.

I mention these matters in order to point out the deficiencies of staff and the programme of survey works that are vitally related to the development of resources in the Dominion. Every endeavour will be made in the coming year to overcome the problems, and, if possible, put in hand some of these urgent survey requirements.

THANKS

I wish to extend my thanks to all my controlling officers and field and office staff for their constant devotion to their duties.

R. G. DICK, Surveyor-General.

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