PROVINCE OF BRITISH COLUMBIA

ANNUAL REPORT

OF THE

LANDS AND SURVEYS BRANCHES

OF THE

DEPARTMENT OF LANDS

FOR THE

YEAR ENDED DECEMBER 31ST, 1941

HON. A. WELLS GRAY, MINISTER OF LANDS

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1942.

VICTORIA, B.C., October 5th, 1942.

To His Honour W. C. WOODWARD,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:-

Herewith I beg respectfully to submit the Annual Report of the Lands and Surveys Branches of the Department of Lands for the year ended December 31st, 1941.

A. WELLS GRAY,
Minister of Lands.

VICTORIA, B.C., October 5th, 1942.

The Honourable A. W. Gray,
Minister of Lands, Victoria, B.C.

SIR,—I have the honour to submit the Annual Report of the Lands and Surveys Branches of the Department of Lands for the twelve months ended December 31st, 1941.

I have the honour to be,
Sir,
Your obedient servant,

H. CATHCART,
Deputy Minister of Lands.

PART I.

DEPARTMENT OF LANDS.

TABLE OF CONTENTS.

	PAGE.
Report of Superintendent of Lands	7
Revenue	7
Sale of Town Lots	8
Pre-emption Records	9
Pre-emption and Homestead Exchanges	9
Land-sales	9
Land Inspections	10
Summary	11
Letters inward and outward	12
Coal Licences, Leases, etc.	12
Crown Grants issued	12
Total Acreage deeded	12
Home-site Leases	13

DEPARTMENT OF LANDS.

VICTORIA, B.C., October 2nd, 1942.

H. Cathcart, Esq.,
Deputy Minister of Lands, Victoria, B.C.

SIR,—I have the honour to submit herewith statements containing details of land administration by the Lands Branch of the Department of Lands during the year ended December 31st, 1941.

One of the outstanding features of the year's business is the continued trend in the method of land settlement noted in recent times, and indicated by the diminishing number of pre-emption entries and a corresponding increase in land sales and leases.

While the increased figure of leases issued is small in itself, it will be noted that the high mark established and reported last year is slightly raised.

There is also a perpetuation of conditions mentioned in former annual reports, particularly the larger volume of reverted-land sales compared to that of ordinary country-land sales.

Again we are in a position to report a gratifying increase in general revenue—a record for the immediate past decade.

In conclusion it may be mentioned that large areas, entailing considerable staff work, have during the year been placed at the disposal of Dominion authorities for war purposes, details of which cannot for obvious reasons be published.

I have the honour to be,
Sir,
Your obedient servant,

NEWMAN TAYLOR,
Superintendent of Lands.

STATEMENT OF REVENUE, YEAR ENDING DECEMBER 31ST, 1941.

LAND-SALES.

	Victoria.	Agencies.	Total.
Under "Coal and Petroleum Act"	.....	.....	.....
Under "Land Act"—			
Townsites	$392.15	$27,677.06	$28,069.21
Country lands	9,638.22	16,975.08	26,613.30
Reverted lands	23,568.70	61,755.66	85,324.36
Pre-empted lands	.....	444.91	444.91
Under special regulations	4,326.22	.....	4,326.22
Former Dominion Railway Belt lands	.....	8,473.81	8,473.81
Surface rights of mineral claims	.....	412.10	412.10
Totals	$37,925.29	$115,738.62	$153,663.91

SUNDRY REVENUE.

Under "Land Act"—			
Sundry lease rentals	$101,689.83	.....	$101,689.83
Grazing lease rentals	4,577.67	.....	4,577.67
Survey fees	546.07	$2,258.41	2,804.48
Sundry fees	13,266.98	1,069.14	14,336.12
Royalty	864.83	.....	864.83
Improvements	706.00	1,578.32	2,284.32
Rent of property	.....	185.00	185.00
Reverted mineral claims	.....	2,773.31	2,773.31
Former Dominion Railway Belt lands—			
Survey fees	.....	700.48	700.48
Totals	$121,651.38	$8,564.66	$130,216.04

SUNDRY REVENUE—*Continued.*

	Victoria.	Agencies.	Total.
Under " Coal and Petroleum Act "—			
Licences	$5,400.00		$5,400.00
Rentals and sundry fees	26,373.29		26,373.29
Lieu of work fees	650.00		650.00
Totals	$32,423.29		$32,423.29

SUNDRY RECEIPTS.

Maps, blue-prints, etc.	$8,635.91		$8,635.91
Miscellaneous	205.91		205.91
Southern Okanagan Project, interest	15,163.05		15,163.05
Former Dominion Railway Belt lands	13,590.31	$2,361.86	15,952.17
Totals	$37,595.18	$2,361.86	$39,957.04

SUMMARY OF REVENUE.

Land-sales	$37,925.29	$115,738.62	$153,663.91
Land revenue	121,651.38	8,564.66	130,216.04
" Coal and Petroleum Act "	32,423.29		32,423.29
Sundry receipts	37,595.18	2,361.86	39,957.04
Totals	$229,595.14	$126,665.14	$356,260.28

SUMMARY OF CASH RECEIVED.

Revenue	$229,595.14	$126,665.14	$356,260.28
" Soldiers' Land Act "—			
Southern Okanagan Project	50,536.19		50,797.46
Houses, South Vancouver	261.27		
" Better Housing Act "—			
Principal	87,350.00		110,022.63
Interest	22,672.63		
Land Settlement Board—			
Land-sales	24,835.81		92,465.68
Loans	67,629.87		
Refund of advances and to votes, etc.	3,263.96		3,263.96
Totals	$486,144.87	$126,665.14	$612,810.01

SALE OF TOWN LOTS, 1941.

Disposal of lots placed on the market after being offered at public auction:—

Vancouver City, 36 lots	$20,160.00
Oliver, 5 lots	1,100.00
Atlin, 10 lots	530.00
Quesnel and West Quesnel, 10 lots	965.00
And 38 lots in various townsites	2,108.00
	$24,863.00

Southern Okanagan Project sold 30 parcels, comprising 162.01 acres, the purchase price being $11,784.

In the University Hill subdivision of Lot 140, Group 1, New Westminster District (Endowment Lands), 25 lots were sold at the sale price of $21,347.50, and 1 parcel comprising 12.26 acres for $6,130.

PRE-EMPTION RECORDS, ETC., 1941.

Agency.	Pre-emption Records allowed.	Pre-emption Records cancelled.	Certificates of Purchase issued.	Certificates of Improvements issued.
Alberni	-----	2	39	-----
Atlin	-----	-----	-----	-----
Clinton	28	-----	64	20
Cranbrook	2	3	44	1
Fernie	-----	6	22	-----
Fort Fraser	23	18	82	9
Golden	3	3	27	3
Kamloops	12	45	149	7
Kaslo	-----	-----	30	1
Nanaimo	4	8	173	2
Nelson	3	1	163	-----
New Westminster	11	21	279	9
Penticton	7	19	90	1
Pouce Coupe	88	65	47	52
Prince George	30	47	103	26
Prince Rupert	-----	4	36	-----
Quesnel	37	59	49	18
Revelstoke	6	8	52	1
Smithers	2	8	33	8
Telegraph Creek	-----	-----	6	-----
Vancouver	2	7	125	2
Vernon	4	3	51	1
Victoria	2	3	1,482	1
Totals	264	330	3,146	162

PRE-EMPTION AND HOMESTEAD EXCHANGES.

UNDER 1934 AMENDMENT TO "LAND ACT."

Year.	No.
1935	41
1936	21
1937	37
1938	10
1939	3
1940	6
1941	7
Total	125

LAND-SALES, 1941.

"Land Act"—	Acres.
Surveyed (first class)	7,207.61
Surveyed (second class)	9,326.64
Surveyed (third class)	3,291.22
	19,825.47
Unsurveyed	520.00
Total	20,345.47

PRE-EMPTION RECORD INSPECTIONS, 1941.

Agency.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Alberni	3	.....	.....	.....	.....	.....	2	1	.....	3	.....	.....	9
Atlin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clinton	52	.....	.....	.....	.....	4	4	30	32	31	9	15	177
Cranbrook	6	.....	.....	.....	.....	.....	14	.....	2	1	.....	10	33
Fernie	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Fort Fraser	1	1	.....	2	24	4	16	5	39	2	3	9	106
Golden	12	.....	.....	.....	7	13	7	.....	2	9	9	.....	59
Kamloops	7	3	1	1	9	8	25	15	20	42	4	9	144
Kaslo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Nanaimo	3	.....	.....	1	.....	1	.....	1	11	14	3	8	42
Nelson	4	.....	.....	1	3	.....	.....	.....	.....	.....	.....	7	15
New Westminster	12	3	.....	1	2	14	17	5	22	.....	44	6	126
Penticton	.....	.....	1	.....	2	1	3	4	5	1	4	1	22
Pouce Coupe	1	32	1	12	24	99	43	137	46	34	.....	.....	429
Prince George	3	.....	.....	1	15	43	5	70	29	37	.....	1	204
Prince Rupert	2	.....	.....	.....	.....	.....	34	6	.....	.....	.....	5	47
Quesnel	18	.....	.....	.....	3	14	.....	61	64	18	1	7	186
Revelstoke	.....	.....	1	.....	1	.....	4	.....	.....	63	.....	.....	69
Smithers	1	1	.....	.....	2	.....	.....	3	10	2	.....	1	20
Telegraph Creek	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Vancouver	1	1	.....	.....	.....	.....	10	3	22	8	4	5	54
Vernon	1	.....	.....	.....	.....	8	1	1	24	11	1	1	48
Victoria	.....	.....	.....	1	.....	.....	.....	.....	1	.....	1	.....	3
Totals	127	41	4	20	92	209	186	342	330	276	84	85	1,796

SUMMARY.

	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Pre-emption records	969	607	664	559	447	413	451	524	934	2,441
Certificates of improvements	154	123	196	245	276	217	208	172	124	113
Certificates of purchase	1,735	1,739	1,452	1,379	1,850	1,831	1,731	1,448	1,432	1,444
Crown grants	1,295	1,074	1,020	1,192	1,316	1,414	1,407	1,636	1,213	1,027
Total acreage deeded	116,990	68,945	173,632	81,110	84,442	71,018	74,175	109,451	62,823	69,542
Coal-prospecting licences	236	95	98	102	118	142	104	160	235	203
Sundry leases	122	92	92	121	157	190	195	196	149	175
Coal leases	17	.....	.....	5	17	2	15	19	33	6
Revenue received	$394,454.43	$346,299.34	$322,440.16	$339,053.79	$404,534.49	$434,213.55	$352,165.35	$618,435.93	$367,115.72	$346,339.89
Letters received	22,857	19,381	15,591	16,901	17,739	19,213	19,140	18,751	21,834	26,304
Letters sent	16,517	14,688	10,936	12,378	15,475	15,537	17,806	14,839	16,581	19,153

	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.
Pre-emption records	1,202	485	478	343	347	416	456	405	329	264
Certificates of improvements	80	63	86	76	107	152	188	172	208	162
Certificates of purchase	1,254	1,211	1,903	1,490	1,701	1,939	1,817	1,828	2,129	3,146
Crown grants	795	758	1,123	1,211	1,028	1,226	1,063	1,108	1,155	1,102
Total acreage deeded	58,470	58,782	61,296.50	77,373.41	68,608.10	93,709.10	66,344.29	59,921.79	59,621.77	64,462.30
Coal-prospecting licences	137	33	83	41	54	47	21	33	43	54
Sundry leases	154	225	168	200	194	195	229	196	237	241
Coal leases	23	70	32	37	45	18	17	20	10	4
Revenue received	$218,814.68	$201,213.80	$238,286.77	$217,822.38	$275,415.45	$243,741.08	$242,076.00	$248,829.25	$294,505.23	$356,260.28
Letters received	26,620	25,106	26,699	22,573	21,572	21,691	22,263	24,605	21,301	20,117
Letters sent	34,402*	22,420*	22,217*	18,194	19,796	19,224	19,662	21,767	17,963	16,833

* Including circulars, statements, etc.

STATEMENT OF LETTERS INWARD AND OUTWARD, 1941.

Lands Branch.

Letters inward	20,117
Letters outward	16,833

MINING LICENCES, LEASES, ETC., 1941.

	No.	Area (Acres).
Licences under the "Coal and Petroleum Act"—		
Original licences issued	31	16,825.00
Renewal licences issued	23	12,966.00
Totals	54	29,791.00
Leases under the "Coal and Petroleum Act"—		
New leases issued	2	380.00
Renewal leases issued	2	704.00
Totals	4	1,084.00
Sundry leases under the "Land Act"—		
Number of leases issued	241	24,078.89

CROWN GRANTS ISSUED, 1941.

Pre-emptions	160
"Pre-emptors' Free Grants Act, 1939"	6
Dominion homesteads	18
Purchases (other than town lots)	416
Town lots	352
Mineral claims	100
Reverted mineral claims	25
Supplementary timber grants	5
"Dyking Assessments Act"	5
"Public Schools Act"	4
"Coal and Petroleum Act"	5
Miscellaneous	6
Total	1,102
Applications for Crown grants	1,201
Certified copies	6
Clearances of applications for leases of reverted mineral claims given	109

Total Acreage deeded.

Pre-emptions	23,195.45
Dominion homesteads	2,622.80
Mineral claims (other than reverted)	3,736.23
Reverted mineral claims	813.83
Purchase of surveyed Crown lands (other than town lots)	26,434.34
Supplementary timber grants	305.65
"Coal and Petroleum Act"	7,354.00
Total	64,462.30

HOME-SITE LEASES (NOT EXCEEDING 20 ACRES).

	No.		Total Annual Revenue.	Fiscal Year ended.
Leases existing on April 1st, 1929		67		
Leases issued, April 1st, 1929, to March 31st, 1930	8		$522.55	March 31st, 1930.
Leases issued, April 1st, 1930, to March 31st, 1931	12		636.45	March 31st, 1931.
Leases issued, April 1st, 1931, to March 31st, 1932	11		759.95	March 31st, 1932.
Leases issued, April 1st, 1932, to March 31st, 1933	31		980.05	March 31st, 1933.
Leases issued, April 1st, 1933, to March 31st, 1934	23		1,246.65	March 31st, 1934.
Leases issued, April 1st, 1934, to March 31st, 1935	24		1,302.52	March 31st, 1935.
Leases issued, April 1st, 1935, to March 31st, 1936	18		1,391.72	March 31st, 1936.
Leases issued, April 1st, 1936, to March 31st, 1937	26		1,440.25	March 31st, 1937.
Leases issued, April 1st, 1937, to March 31st, 1938	15		1,468.90	March 31st, 1938.
Leases issued, April 1st, 1938, to March 31st, 1939	29		1,557.40	March 31st, 1939.
Leases issued, April 1st, 1939, to March 31st, 1940	21		1,591.80	March 31st, 1940.
Leases issued, April 1st, 1940, to March 31st, 1941	27		1,717.10	March 31st, 1941.
Leases issued, April 1st, 1941, to March 31st, 1942	27		1,846.85	March 31st, 1942.
	—	272		
		339		
Leases cancelled during this period	10			
Leases Crown-granted	1			
	—	11		
Leases at present existing		328		
Total revenue received from April 1st, 1929, to March 31st, 1942			$16,462.19	

PART II.

SURVEYS BRANCH.

TABLE OF CONTENTS.

	PAGE.
Report of the Surveyor-General, Surveys Branch	17
Report of Surveys Division	20
Table A—Summary of Office-work	20
Table B—List of Departmental Mineral Reference Maps	21
Table C—List of Departmental Reference Maps	22
Report of Aerial Photograph Librarian	25
Report of Geographic Division	25
Reports of Surveyors—	
Topographical Survey, Kechika River Valley (A. J. Campbell)	27
Topographical Survey, Liard and Dease Rivers (N. C. Stewart)	29
Triangulation Survey, Turnagain River to Dease Lake (H. Pattinson)	32
Topographical Survey, Great Central Lake (R. D. McCaw)	36
Topographical Survey, Toquart and Kennedy Rivers (G. J. Jackson)	37

REPORT OF THE SURVEYOR-GENERAL.

VICTORIA, B.C., January 2nd, 1942.

H. Cathcart, Esq.,
Deputy Minister of Lands, Victoria, B.C.

SIR,—I have the honour to submit the following report on the operations of the Surveys Branch for the year ended December 31st, 1941.

The Surveys Branch, now reduced by enlistments from its average staff of forty-nine, is organized into three divisions—Surveys, Geographic, and Topographic. The Surveys Division deals with field-notes of all surveys of Crown lands, whether made by Government or privately employed surveyors; checks these field-notes and plots therefrom; and keeps an up-to-date record of the standing of lands and surveys on some 270 large-scale reference maps drawn on tracing-linen. The division has a blue and ozalid printing department serving all branches of the Government, and meeting the needs of these, and of the general public, for copies of reference and other maps to the value of about $8,000 per annum.

The Topographic Division includes a staff of B.C. Land Surveyors specially trained in topographic mapping; these men spend their summers on field-work and their winters plotting contour maps based on that field-work; the field-work is permanent in character and, though adjusted to meet any immediate needs, fits without waste into a long-term plan for the progressive contour mapping of the entire Province.

The Geographic Division is responsible for keeping the published maps of the Province truly representative of the latest information available. That information comes from triangulation surveys and from the Surveys and Topographic Divisions, from the Forest and Water Branches, the Mines and Public Works Departments, from the Geodetic, Geological, Topographical, and Hydrographic services of the Dominion Government; as well as from prospectors and others having knowledge of out-of-the-way places. The division draws the maps, secures tenders from lithographers, and supervises publication; there is also in the division photostatic equipment with an experienced operator who makes photostats and enlargements and reductions to scale for all Government Departments, and to some extent for Navy, Army, Air Force, and general public.

Due to its general mountainous character, only a small percentage of the area of the Province requires subdivision into small agricultural holdings, but immense tracts of mountain terrain are rich in resources of mineral, timber, and water-power, and the prosperity of the lowlands depends largely on the successful development of the mountain resources. In a country of such high relief, contour maps are the best foundation for any appraisal of resources; and the need for such maps over vast areas, coupled with the limited expenditures possible with our small population, has kept constant our search for accurate yet economical methods. The method here developed uses aerial photographs taken at 15,000 feet altitude; but, as such photographs vary greatly in scale over the mountain country beneath, control over plan and elevation is secured by triangulation, with stations on the summits and by rounds of oriented ground photographs taken from commanding positions, using special cameras of fixed focal length; the method takes advantage of our mountains, and our contour-mapping costs seem to be as low as any in Canada, averaging, as they do, less than $25 per square mile, including everything from the aerial photography to plotting the contour map.

In the belief that good maps are a useful guard against costly errors in development, an attempt is made to foresee future trends, and an overland transportation route to Yukon and Alaska seems to be in the offing. There are three general routes through Northern British Columbia which have been urged from various quarters and which are governed by the three more or less parallel mountain systems of the Coast Range, the Cassiar Range, and the Rocky Mountains.

Route A lies east of the Coast Range, leaving the Canadian National Railway and the main highway at Vanderhoof, or possibly at Hazelton, passing over the divide at the head of the Skeena River to Stikine River waters, crossing the latter river above Telegraph Creek, thence via Atlin, Whitehorse, and Kluane Lake to the Alaska border and Fairbanks. This route is favoured in the report of the American section of the Alaska Highway Commission due to its proximity to the Alaska Panhandle; though not fully investigated this route through British Columbia calls for higher passes and heavier construction than Route B.

Route B is favoured by the Canadian section of the Alaska Highway Commission; it can leave the present highway at Summit Lake, 32 miles east of Prince George, and follow the Rocky Mountain Trench occupied by the valleys of the Parsnip, Finlay, Kechika, and Liard Rivers to the northerly boundary of the Province; and thence follow the Liard, Frances, Finlayson, Pelly, and Yukon to Dawson, whence connection to the Richardson highway in Alaska is feasible, or it can branch off from the Pelly, cross the Yukon at Five Finger Rapids and cross the Alaska boundary on Ladue River; thence to the Richardson highway and Fairbanks. This is the shortest possible route for traffic from the south; has a maximum altitude of 3,273 feet (Sifton Pass), and follows river valleys throughout; and with a short connection would place Peace River produce in a favoured position in the Far North market. On this route our survey information is complete and the grades are such that a railway along this route is perfectly feasible.

Route C, favoured by Alberta interests, would run from rail-head at Dawson Creek to Fort St. John; thence to Fort Nelson across a country poorly drained; thence down the Fort Nelson River and westerly through the Rocky Mountains via the difficult Liard Valley to Lower Post and Watson Lake. This route would serve the airports at Fort St. John and Fort Nelson, but is over 100 miles longer to Lower Post than is Route B, and offers far greater construction difficulties and worse alignment and grades.

Due to the limits of staff and available funds, the Survey Branch has so far been able to map only one of the suggested routes, this being the B or Rocky Mountain Trench route. This mapping was completed in 1941 after several years of activity, using aerial and ground photographs and a triangulation net extending from Prince George to the northerly boundary of the Province. This work disclosed a route following wide and flat but well-drained river valleys, unbelievably straight and almost without rock-work—far the easiest piece of construction of similar length in British Columbia.

It is proposed to continue investigations of other areas in Northern British Columbia so that nothing may be overlooked in planning for the future development of that country and its transportation routes.

In 1941 we had two topographical survey parties, under A. J. Campbell and N. C. Stewart respectively, completing the mapping of Route B as above, and one triangulation party under Hugh Pattinson connecting the Route B triangulation to the net on the Stikine River near Telegraph Creek. R. D. McCaw and G. J. Jackson were respectively in charge of topographical survey parties working north of Barkley Sound on areas of interest to the military authorities. There was little demand for land boundary surveys, but such as arose were fully met.

My 1940 report listed the names of ten members of the Survey Branch staff who had enlisted in the Armed Forces and it is with very great regret that I have to report that R. F. Leighton, R.C.A.F., one of these, has been killed overseas.

Our Topographical Division has in the year lost R. D. McCaw, B.C.L.S., who became ill while on field-work and died a month later, and W. J. Moffatt, B.C.L.S., who died suddenly on field-work near Lower Post. These men are missed as much for their fine personal qualities as for their marked contributions to improved mapping technique.

Reports compiled by F. O. Morris and W. G. H. Firth for the Surveys and Geographic Divisions respectively, giving details of the work carried on under their supervision and of the maps published, as well as reports from the surveyors employed on field-work, are attached hereto. Owing to enlistments and the lesser skill of those

temporarily employed to fill the gaps, some of our basic reference maps lag, and the fact that fully half the time of our Geographic staff is devoted to special map requirements of the military authorities necessitates postponement of other map-work; however, the staff has risen to the occasion and the general public is well served.

I have the honour to be,
Sir,
Your obedient servant,

F. C. GREEN,
Surveyor-General.

APPENDIX TO REPORT OF SURVEYOR-GENERAL.

BY F. O. MORRIS, ASSISTANT SURVEYOR-GENERAL.

SURVEYS DIVISION.

This Division deals with the general correspondence, the supply of survey information to land surveyors and the general public, preparation of instructions for surveying, checking survey field-notes and plotting official plans therefrom, clearing all applications, and many minor activities.

A blue and ozalid printing plant is maintained, rendering service to the various governmental Departments.

Aerial Photograph Library.—A considerable portion of the Province has been photographed from the air and an effort is made in this office to have on record one copy of each of these aerial photographs. These are available for inspection and at present total 96,647 views, consisting of 75,603 taken by Department of National Defence, 14,712 by B.C. Forest Service, and 6,332 by Western Canadian Airways. Index maps showing the position of these aerial photographs are also on record and available for inspection.

Departmental Reference Maps.—In order to keep a proper graphic record of alienations and inquiries, reference maps, generally on the scale of 1 mile to 1 inch, and mineral reference maps on the scale of 1,500 feet to 1 inch, drawn on tracing-linen, are maintained by the Surveys Division. There are now 193 reference maps and 77 mineral reference maps, making a total of 270 maps. The work of keeping these up to date—(1) by adding new survey information as it becomes available, and (2) by renewing same when worn out with constant use and handling in the blue-print machines—forms a considerable portion of the work of the Division. During the year four new reference maps were made and ten were recompiled. Tables B and C, attached hereto, give a list of these reference maps.

Table A, which follows, summarizes the main items of work.

TABLE A.—SUMMARY OF OFFICE-WORK FOR THE YEAR 1941, SURVEYS DIVISION.

Number of field-books received	271
" lots surveyed	291
" lots plotted	276
" lots gazetted	294
" lots cancelled	44
" mineral-claim field-books prepared	146
" reference maps compiled	14
" applications for purchase cleared	208
" applications for pre-emption cleared	335
" applications for lease cleared	297
" coal licences cleared	70
" water licences cleared	122
" timber-sales cleared	2,046
" free-use permits cleared	375
" hand-loggers' licences cleared	11
" Crown-grant applications cleared	935
" reverted-land clearances	1,087
" cancellations made	649
" inquiries cleared	2,128
" placer-mining leases plotted on maps	286
" letters received	4,431
" letters sent out	3,113
" Crown-grant and lease tracings made	1,022
" miscellaneous tracings made	96
" Government Agents' tracings made	86
" blue-prints made	19,912
Revenue received from sale of blue-prints from other departments and public	$3,823.52
Value of blue-prints for Lands Department	$3,517.25
Number of documents consulted and filed in vault	30,952

TABLE B.—LIST OF DEPARTMENTAL MINERAL REFERENCE MAPS.

No.	Title of Reference Map.
10T215.	Stump Lake; Nicola Valley.
1T257.	Mt. Sicker.
2T257.	Cherry Creek, Iron Mask, and Peterson Creek, Kamloops.
3T269.	Portland Canal; Stewart; Marmot River to Bitter Creek.
4T269.	Premier Mine; Big Missouri; Rufus Argenta.
5T269.	Salmon and Dilworth Glaciers.
7T269.	Upper Kitsault River; Dolly Varden Mine.
8T269.	Lower Kitsault River and Alice Arm.
9T269.	Grand Forks and Granby River.
10T269.	Greenwood; Ingram Creek to Eholt.
11T269.	McRae Creek; Coryell and Paulson to Porcupine.
12T269.	Franklin and Burrell Creeks.
13T269.	Princeton and Copper Mountain.
14T269.	Headwaters of Boundary and Pass Creeks.
15T269.	Wallace Mountain, Beaverdell, and Carmi.
16T269.	Hedley Camp.
17T269.	Northerly Portion of Texada Island.
18T269.	Camp McKinney; Rock Creek.
19T269.	Owen Lake.
20T269.	Topley-Richfield Mine.
21T269.	Bridge River; Pioneer, Bralorne, and Minto Mines.
22T269.	Anyox; Hastings Arm to Portland Canal.
23T269.	Windfall (Lost) Creek to Kettle River.
24T269.	McGillivray Creek and Headwaters of Cadwallader Creek.
25T269.	Gun and Tyaughton Creeks.
1T280.	South Okanagan and Fairview Camp.
2T280.	Ymir and Porcupine Creeks.
3T280.	Rossland; Big Sheep Creek to Columbia River.
5T280.	Phillips Arm; Fanny Bay; Thurlow and Sonora Islands.
6T280.	Trail; Part of Rossland; Murphy Creek.
7T280.	Sheep Creek and Salmo.
8T280.	Taku Arm of Tagish Lake; Engineer Mine.
9T280.	Fort Steele and Wild Horse Creek.
10T280.	Castlegar and East to Erie Creek.
12T280.	Moyie Lake.
13T280.	Osoyoos and Vicinity.
1T286.	Lardeau River, Poplar to Gerrard.
2T286.	Sullivan Mine and Kimberley Area.
3T286.	Trout Lake and Lardeau Creek.
4T286.	Lardeau River, Poplar to Bosworth.
5T286.	Ferguson to Westfall River.
6T286.	Beaver Creek; Erie to Fruitvale.
7T286.	Camborne, Incomappleux River, and Poole Creek.
8T286.	Duncan River to Headwaters of Healy Creek.
10T286.	Summit Creek, Headwaters of Sheep Creek, and John Bull Mountain.
11T286.	Smithers; Hudson Bay Mountain; Duthie Mine.
12T286.	Britannia Mine, westerly portion; Howe Sound.
1T294.	Britannia Mine, easterly portion.
2T294.	Atlin and Pine Creek.
3T294.	Christina Lake to Big Sheep Creek.
4T294.	Coast Copper Mine; Elk River and Kathleen Lake.
5T294.	Keremeos; Olalla; Hedley Lake.
8T294.	Upper Bear Valley; George Copper Mine to Meziadin Lake.
9T294.	Williams Creek; vicinity of Barkerville.
1T300.	Nelson and South to Hall Creek.
2T300.	Ainsworth, Kokanee Park, and Slocan. (40 chains=1 inch.)
3T300.	Kaslo, Sandon, and Silverton. (40 chains=1 inch.)
4T300.	Horseshoe Mountain; Canyon Creek; Kettle River.
5T300.	Kootenay Lake, Midge Creek, and Headwaters of Ymir Creek.
6T300.	Kootenay River; Beasley to Thrums.
7T300.	South Fork of Salmo River and Priest River.
8T300.	Kootenay Landing and Cultus Creek.
9T300.	Reeves-McDonald Mine; Pend d'Oreille River.
10T300.	Poupore Creek, Castlegar, and West to Shields.
11T300.	Headwaters of Big Sheep Creek.
1T332.	Monashee Creek; Cherry Creek (contoured).
2T332.	Lightning Peak and Headwaters of Granby River (contoured).
3T332.	Lightning Creek, Cottonwood and Swift Rivers.
4T332.	Upper Antler Creek, Cunningham Creek, and Swamp River (contoured).
5T332.	Caribou Mountain, Swift River, and Little Swift River (contoured).
6T332.	Swift River and Fountain Creek (contoured).
7T332.	Rock Creek, Westbridge, and Kettle River.
8T332.	Bridge River; Tyaughton Creek to Rexmount.
10T332.	Zeballos and Tahsis Rivers.
1T348.	Perry Creek and Marysville.
3T348.	Amberty and Sutter Creeks (Summit Camp), tributaries of Tulameen River.
4T348.	Moyie River and Upper Perry Creek.

NOTE.—These mineral reference maps show surveyed mineral claims. They are compiled from all available data and are constantly being amended, and their accuracy is therefore not guaranteed. They were prepared originally for departmental use, and, having proved of value to the public, prints of same are now on sale.

The above maps are on the scale of 1,500 feet to 1 inch, except where otherwise noted. BLUE prints and OZALID prints can be obtained for $1 each. (OZALID prints have deep brown lines on a white background.)

Orders, or inquiries, should quote the map number, and be addressed to:—

SURVEYS DIVISION, LANDS DEPARTMENT, VICTORIA, B.C.

Victoria, B.C., January 2nd, 1942.

Table C.—List of Departmental Reference Maps.

No.	Title of Reference Map.
1.	West Coast, V.I. (Barkley Sound, Southerly).
1A.	West Coast, V.I. (Toquart Harbour and Great Central Lake).
1B.	West Coast, V.I. (Kennedy Lake and Clayoquot Sound).
2.	West Coast, V.I. (Nootka District).
3.	Belize and Seymour Inlets and Smith Sound.
3A.	Quatsino and West Portion of Rupert District.
3B.	Gilford, Cracroft, and Broughton Islands.
3C.	Nimpkish River Valley and Lake.
3D.	West Coast, V.I. (Quatsino Sound and Kyuquot).
4.	Knight and Loughborough Inlets.
4A.	Sayward District, Thurlow and Quadra Islands.
4B.	Bute Inlet.
5.	Texada Island and West Portion, New Westminster District.
5A.	Lower Fraser River; New Westminster City to Fort Langley, Pitt Lake, and Indian Arm.
5B.	Sechelt Inlet and Howe Sound.
5C.	Harrison Lake, Pitt River, and Lillooet River Valley.
5D.	Sumas, Alouette, and Stave Lakes.
6.	Redonda Islands, Powell Lake, and Toba Inlet.
6A.	Nicola Valley.
6B.	Aspen Grove and Tulameen.
6C.	Princeton, Ashnola, and South Similkameen River Valleys.
7.	North Okanagan and Vernon.
7A.	Penticton, Kelowna, and Okanagan Lake.
7B.	Oliver and South Okanagan.
8.	Greenwood, Rock Creek, and Beaverdell.
9.	Mission Creek and Kettle River Headwaters.
10.	Mabel Lake, Lumby, and Sugar Lake.
11.	Upper Horsefly River and Clearwater Lake.
11A.	Bonaparte River, North Thompson River Valley (Railway Belt to Mt. Olie).
12.	Dean and Burke Channels and Bella Coola Valley.
12A.	Dean (Salmon) River Valley.
12B.	Kimsquit and West Side of Dean Channel.
13.	Rivers Inlet and Fitzhugh Sound.
14.	Banks and McCauley and Porcher Islands.
14A.	Graham Reach, Gardner Canal, and Kitimat Arm.
14B.	Kitlobe River and West End of Eutsuk and Whitesail Lakes.
14C.	Grenville, Squally, and Douglas Channels.
15.	Moresby Island, Northern Portion.
15A.	Moresby Island, Southern Portion.
16.	Graham Island, North-east Portion.
16A.	Graham Island, South Portion.
16B.	Graham Island, North-west Portion.
17.	Portland Canal and Observatory Inlet.
17A.	Upper Skeena and Babine River Valleys.
17B.	Nass and Kitwancool River Valleys.
18.	Upper Fraser and Morkill River Valleys.
18A.	Upper Fraser River Valley and Robson Park.
18B.	Tête Jaune, Swift Creek, and Albreda.
19.	Skeena and Zymoetz River Valleys.
19A.	Skeena and Kitimat River Valleys.
19B.	Prince Rupert, Mouth of Skeena River.
20.	Skeena and Bulkley Valleys, vicinity of Hazelton.
21.	Barkerville, Willow and Bowron River Headwaters.
21A.	Fraser Lake, Endako River, and South End of Stuart Lake.
21B.	Endako River and South End of Babine Lake.
22.	Bowron and Upper Fraser River Valley (vicinity of Hutton).
22A.	Fraser River, Fort George, South.
22B.	Portion of Nechako, Stuart, and Salmon River Valleys.
22C.	Blackwater and Chilako River Valleys.
22D.	Fraser and Cottonwood River Valleys.
22E.	McBride, Goat, and Upper Fraser River Valleys.
23.	Quesnel Lake (North and East Arm) and Headwaters of North Thompson River.
23A.	Quesnel Forks and Swamp River.
23B.	Fraser River, Quesnel, South.
23C.	Nazko River Valley.
24.	150-Mile House and Harpers Camp.
24A.	Bridge River, Anderson and Seton Lakes, Lillooet District.
24B.	Lillooet District (Clinton and Green Lakes).
25.	Mainland Coast, Princess Royal and adjacent Islands.
25A.	Bella Bella and Milbanke Sound.
26.	Dundas and adjacent Islands.
27.	Fraser River Valley (Williams Lake and Soda Creek).
27A.	Lac la Hache and Lone Butte.
27B.	Fraser River Valley, Gang Ranch, North.
27C.	Fraser River, vicinity of Big Bar Creek.
28.	North Part of Babine and Takla Lakes.
28A.	Stuart, Pinchi, and Trembleur Lakes and Middle River.
28B.	Nation River and Lakes.
29.	Chilcotin and Chilanko Rivers, West of 124th Meridian.
29A.	Charlotte Lake and Bella Coola River Headwaters.
29B.	Chilcotin River Valley, vicinity of Alexis Creek.
29C.	Hanceville, Big Creek, and Taseko River.
30.	Canim Lake and North Thompson River, vicinity of Vavenby.
31.	Bulkley Valley.
31A.	Central Part, Babine Lake.
32.	Crooked River, McLeod Lake, and Upper Parsnip River.
32A.	Tatla, Tatlayoko, and North End of Chilko Lakes.

No.	Title of Reference Map.
32B.	Homathko and Klinaklini River Valleys.
33.	Fraser River Valley, Fort George, North.
34.	Lot 4593, Kootenay District, Flathead River.
35.	North Saltspring, Ladysmith, and adjacent Islands. (2 in. = 1 mile.)
36.	Upper Fraser River (vicinity of Hansard and McGregor River Valley).
36A.	Headwaters of Wapiti and Herrick Rivers.
37.	Nechako River, Cluculz and Bednesti Lakes.
38.	Murtle Lake, North Thompson River and Blue River.
38A.	Finlay River Valley. (½ in.=1 mile.)
38B.	Groundhog Coal Area and Upper Stikine River Valley. (½ in.= 1 mile.)
38C.	Groundhog Coal Area and Upper Skeena and Nass Rivers. (½ in. =1 mile.)
39.	West End of Ootsa Lake.
39A.	Eutsuk Lake.
40.	Tetachuck and Natalkuz Lakes.
41.	Upper Nechako River and Tachick Lake.
42.	Columbia and Goldstream Rivers, Kinbasket Lake.
42A.	Avola, North Thompson River Valley, and Upper Adams River.
42B.	Columbia River (Big Bend) and Canoe and Wood Rivers.
42C.	Columbia River Valley (vicinity of Bush River).
43.	Pouce Coupé, Rolla, Dawson Creek, and Arras.
43A.	Blueberry River and Rose Prairie.
43B.	Peace River, Hudson Hope, and Fort St. John.
43C.	Moberly Lake, Pine River, and Cowie Creek.
44.	Kiskatinaw, Murray, and Sukunka Rivers.
44A.	Wapiti, Murray, and Head of Parsnip Rivers.
45.	Alberni District and Baynes Sound.
46.	Sooke, Malahat, and Metchosin Districts. (2 in.=1 mile.)
47.	Peace River, West of Dominion Block.
48.	Parsnip and Nation Rivers.
49.	Misinchinka River and Pine River Pass.
50.	Halfway, Peace, and Graham River Valleys.
51.	Fort Grahame and Finlay River.
52.	Atlin Lake and vicinity. (½ in.=1 mile.)
53.	Telegraph Creek and Stikine River Valley. (½ in.=1 mile.)
54.	Upper Nass River Valley and Meziadin Lake.
55.	Salmon River Headwaters and McLeod River.
56.	Driftwood River and North End of Tatla Lake.
57.	Headwaters of Omineca River.
58.	Finlay Forks and Parsnip River.
59.	Ingenika and Mesilinka Rivers. (½ in.=1 mile.)
60.	Taseko Lake and Head of Bridge River.
61.	South Fork of Bridge River and Head of Lillooet River.
62.	Head of Jervis Inlet and Squamish River.
63.	Lillooet Lake and Green River.
64.	Shawnigan and Sooke Lakes, and parts of Malahat, Shawnigan, and Helmcken Districts. (2 in.=1 mile.)
65.	Fraser River Mouth, Burrard Inlet, and Southern Part of Howe Sound.
66.	Fortress Lake and Bush River, East Kootenay.
67.	Dean River and Anahim Lake.
68.	Baezaeko and Chilcotin River Headwaters.
69.	Comox, Buttle Lake, and Strathcona Park.
70.	Cowichan Lake, Port Renfrew, and Jordan River.
71.	Klinaklini River Headwaters.
72.	Head of Knight Inlet.
73.	Dease Lake. (½ in.=1 mile.)
74.	Taku River, Cassiar District. (½ in.=1 mile.)
75.	Iskut River and Lower Stikine River. (½ in.=1 mile.)
76.	Klehini River and Rainy Hollow. (½ in.=1 mile.)
77.	Houston and Morice River.
78.	Teslin Lake. (½ in.=1 mile.)
79.	Dease River and McDame Creek. (½ in.=1 mile.)
80.	Burns Lake and West End of Francois Lake.
81.	Seymour Inlet and Wakeman River.
82.	Head of Rivers Inlet and Owikeno Lake.
83.	Bella Coola Valley.
84.	Work Channel and Nass Bay.
85.	Francois Lake and East End of Ootsa Lake.
86.	Lower Fraser Valley, Chilliwack to Hope.
87.	Yale to North Bend.
88.	Lytton, Spences Bridge.
89.	Ashcroft and Thompson River Valley.
90.	Kamloops and North Thompson River.
91.	South Thompson River, Salmon Arm, and Shuswap Lake.
92.	Sicamous, Shuswap Lake, and Mabel Lake.
93.	Adams Lake, Seymour Arm, and Shuswap Lake.
94.	Seymour River and Columbia River Valley North of Revelstoke.
95.	Illecillewaet River, Glacier Park, and Donald.
96.	Golden, Columbia River, and Kicking Horse River.
97.	Muskwa, Prophet, and Sikanni Chief Rivers. (½ in.=1 mile.)
98.	Nig Creek, Sikanni Chief, and Beatton Rivers. (½ in.=1 mile.)
99.	Headwaters of Moberly River and parts of Peace and Pine Rivers.
100.	Skeena and Kitsumgallum River Valleys.
101.	Skeena River Valley, Vanarsdol, and Dorreen.
102.	Manson Creek and Omineca River.
103.	Victoria and vicinity. (2 in.=1 mile.)
104.	Saanich Peninsula and adjacent Islands. (2 in.=1 mile.)
105.	Galiano and Saturna Islands. (2 in.=1 mile.)

TABLE C.—LIST OF DEPARTMENTAL REFERENCE MAPS—*Continued.*

No.	Title of Reference Map.
106.	Nanaimo, Gabriola Island, Roberts Creek, and Trail Bay.
107.	Headwaters of Elk and Palliser Rivers, East Kootenay.
108.	Nanaimo River, Nanoose and Qualicum Beach.
109.	Euchiniko and Batnuni Lakes.
110.	Kechika and Turnagain Rivers.
15–0.	Upper Elk and White River Valleys.
15–9N.	Fernie and Crowsnest vicinity.
15–9S.	Elko and vicinity.
16–9N.	Kootenay River Valley and Cranbrook.
16–9S.	Moyie River Valley.
17–0N.	Duncan River and Gerrard.
17–0S.	Duncan Lake and North End of Kootenay Lake.
17–9N.	Kootenay Lake, vicinity of Kaslo.
17–9S.	Nelson, Salmon River Valley, and South End of Kootenay Lake.
18–9N.	Edgewood and Slocan River Valley.
18–9S.	Rossland and South End of Lower Arrow Lake.
18–20.	Nakusp and Upper Arrow Lake.
21–23.	Columbia and Windermere Lakes.
27–29.	Columbia River Valley, Wilmer and Spillimacheen.
30–32.	Columbia River and Upper Arrow Lake.

NOTE.—These reference maps show lands alienated and applied for, "Timber Limits," "Coal Licences," etc., surveyed and unsurveyed. They are compiled from all available data and are constantly being amended, and their accuracy is therefore not guaranteed. They were prepared originally for departmental use, and, having proved of value to the public, prints of same are now on sale.

The above maps are on the scale of 1 mile to 1 inch, except where otherwise noted. BLUE prints and OZALID prints can be obtained for the sum of $1 each. (OZALID prints have deep brown lines on a white background.)

Orders, or inquiries, should quote the map number, and be addressed to:—

SURVEYS DIVISION, LANDS DEPARTMENT, VICTORIA, B.C.

Victoria, B.C., January 2nd, 1942.

REPORT OF AERIAL PHOTOGRAPH LIBRARY.

BY W. J. H. HOLMES.

Number of aerial views on file December 31st, 1941—

Royal Canadian Air Force (A)	73,983
Royal Canadian Air Force (BA)	1,620
Western Canada Airways (WCA)	6,238
British Columbia Forest Service (BC)	14,712
Canadian Airways, Ltd. (Alaska Highway obliques)	94
Total	96,647

During 1941 the number of aerial views received and taken on file were 2,487. These were mostly British Columbia flights by the British Columbia Forest Branch. There remain a considerable number of British Columbia views taken during 1938, 1939, and 1940 that have not yet been received for filing.

During 1941, 10,975 views were issued on loan and 10,166 views were returned.

There are at present (December 31st, 1941) 9,006 aerial views out on loan.

Views were issued on loan to the British Columbia Forest Service; the Topographic Branch, the Geographic Branch, and the Survey Branch of the Surveyor-General's Department; the Department of Public Works, the Department of Mines, the Water Rights Branch, and the Department of Railways; to the Royal Canadian Air Force and other branches of the military services; and, to a limited extent, to surveyors and others of the general public.

Topographic Survey Ground Views.—There are on file the ground views taken by the Topographic Survey Branch from 1914 to 1941, and estimated to number approximately 35,000; also the corresponding photographic plates.

Reference Maps.—Aerial view index maps now number 97 and topographic ground view index maps 66.

GEOGRAPHIC DIVISION.

BY W. G. H. FIRTH, ACTING CHIEF GEOGRAPHER.

MAPS.

Published.

Name.	No. of Copies.	Date of Issue.	Dept. Map No.	Scale.	Area in Sq. Miles.
Revelstoke-Golden	4,000	June, 1941	5D	4 mi. to 1 in.	15,000
North Thompson	4,000	Jan., 1942	3J	3 mi. to 1 in.	9,350
British Columbia	1,000	June, 1941	1CX	50 mi. to 1 in.	366,255
British Columbia	250	Aug., 1941	1JF	27 mi. to 1 in.	366,255
Highway and Travel (revised to date)	1,800	Dec., 1941	P.W.D.	20 mi. to 1 in.	.....

In Course of Preparation.

Nechako Pre-emptors' Map	.....	.....	3B	3 mi. to 1 in.	9,350
Fort George Pre-emptors' Map	.....	.....	3A	3 mi. to 1 in.	9,350
Nelson Degree Sheet (Revision)	.....	.....	4B	2 mi. to 1 in.	3,050

GEOGRAPHIC BOARD OF CANADA, NAMING AND RECORDING.

Number of map-sheets' names reviewed	14
New names recorded	549

GEOGRAPHICAL WORK FOR OTHER DEPARTMENTS, NATIONAL DEFENCE AND PUBLIC.

Ninety items, receipts and value of work $1,708.00

Map Stock and Distribution.

Maps issued to Departments and public	12,401
Maps received into stock	9,237
Total value of printed maps issued	$4,450.75
Revenue from printed maps	$4,139.49

Photostat.

Total number of photostats made	2,562
Revenue from Departments and public	$675.00
Value of photostats for Lands Department, etc.	$1,387.15

Letters.

Letters received and attended to	1,370

Standard Base Map.

Nechako Pre-emptors' Sheets, compiled complete	8
Standard Base Map, skeleton sheets compiled	6
School districts plotted from description	35
Control nets supplied	33

Triangulation.

Main and Coast, by least square adjustment, triangles adjusted	241
Secondary, by rectangular co-ordinates, stations	746
Index-cards, records	649
Triangulation index maps	3

Résumé.

Sergeant-Pilot R. F. Leighton, R.C.A.F., a popular member of the staff in military service, was killed on active service on November 1st, 1941—reported to be the first Civil Servant killed on active service.

Sapper L. Roach, R.C.E., on leave for military service, resigned on May 9th, 1941.

Sean Howard was appointed as apprentice draughtsman (war replacement) on March 24th, 1941.

The section of the Division primarily concerned with the compilation of maps and making the final drawings for reproduction purposes has been taxed to the limit to meet the normal demands and the requests made by the Pacific Military and Western Air Commands, also the British Columbia Police, for special types of maps required for national defence.

The Division has been in daily contact with these services and has met all requests, sometimes of an exacting nature, satisfactorily. This work included the preparation and drawing of large-scale operational maps and charts, the delimitation and legal description of defence areas, etc.; work requiring close co-operation with the authorities concerned and for which the members of the Division by experience and training are particularly fitted.

At the request of the Surveyor-General for the Dominion, complete data were assembled and forwarded to Ottawa for the production of seventeen maps of various types covering the coastal and other vulnerable areas of the Province and urgently required by the Pacific Military and Western Air Commands. These maps are submitted to this Division for final revision before publication. Appreciative comments for the co-operation and help given in this large volume of work have been received.

The valuable record of geographical names built up over a period of thirty years has been maintained. There are now over 25,000 record-cards properly indexed and, where available, a concise historical note on the name, and whether confirmed by the Geographical Board of Canada, appears on the reverse side of the card.

A special descriptive brochure on Hamber Park was compiled and designed for presentation to the Honourable Eric W. Hamber and twenty-five copies were later produced for private distribution and publicity purposes.

It is noted a considerable increase is shown in the number of maps issued; also the revenue from the sale of printed maps was practically doubled. The stocks of Maps 1A, Wall Map of British Columbia; 1J, British Columbia; and 1H, Northern British Columbia, have been greatly depleted owing to military demands, particularly those made by the Chief Engineer, U.S. Army, Washington, D.C. These maps were evidently the best available for aeronautical and other purposes.

The production of maps and distribution and dissemination of geographical data are of prime importance at the present time and this Division, sometimes under adverse circumstances, has been and is playing an important rôle in the interests of national defence.

It would be unfair for the writer to mention any particular member, as he can state without reserve that the whole staff have applied themselves diligently to the extra work imposed on them and with a most commendable spirit.

TOPOGRAPHICAL SURVEYS, KECHIKA RIVER VALLEY.

BY A. J. CAMPBELL, B.C.L.S.

F. C. Green, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to submit the following report on the topographical surveys carried out under your instructions of June 3rd, 1941.

In these instructions the area assigned to us covered that part of the Kechika River Valley lying below the area mapped by Mr. N. C. Stewart, B.C.L.S., in 1940, and extending north-westerly a distance of approximately 65 miles to the Earle River. A party under Mr. Stewart was carrying on the mapping field-work from the Earle River to the north boundary of the Province.

The valley had been covered with vertical aerial photographs in 1940, and the purpose of the survey was to obtain sufficient data to prepare a topographical map on the scale of 1 mile to 1 inch and a contour interval of 100 feet. The immediate purpose of the map is to show information that would be of value to engineers studying the relative advantages of different possible routes for a highway to Alaska. This field-work was completed and data obtained to cover an area between 600 and 700 square miles.

The field party consisted of R. D. Fraser and A. H. Ralfs, both of the permanent staff, as assistants; three survey helpers; a cook, a packer, and a river-boatman. Only one of these men, the packer, was on the ground. Two of them came across country from Fort Ware and the remainder were taken in from the outside by way of Wrangell, Alaska, Telegraph Creek to Dease Lake. From there to Scoop Lake, a small lake in the Kechika Valley and very close to the centre of our area, men, outfit, and supplies were taken in by plane. This saved considerable time, which was important, due to the rather short season, in that country, suitable for our work. At Scoop Lake the two men from Fort Ware, "Skook" Davidson and a packer, were anxiously awaiting us. They had expected us some days earlier and were completely out of supplies and living on the country. Davidson had twenty-two head of horses, all in fine condition after spending their second winter in the valley, a few miles above Scoop Lake. From the almost luxuriant growth of good grass that was later noted throughout the valley, and the reported light winter snowfall, there seems to be no reason why horses or even cattle should not be able to winter range.

The majority of these horses went on to join Mr. Stewart's party at Lower Post, on the Liard River, leaving a few to assist in our transportation problems away from the river. This portion of the Kechika River is readily navigated by small river-boats, and we had our choice of the two boats built in 1940, of whip-sawn lumber, near the head of the Kechika, for the use of Mr. Stewart's and Mr. Pattinson's parties. These

boats had been left with Mr. Davidson for the winter and were in surprisingly good condition, considering they had been built of green lumber with a minimum of tools.

The work was completed to the Earle River on September 12th and we moved by pack-train to Lower Post, where some work was done to assist Mr. Stewart's party. The party was then disbanded and the outfit brought up the Dease River to Dease Lake and thence to Victoria, which was reached on October 9th.

PHYSICAL FEATURES.

The Kechika is a well-defined valley down to its junction with the Turnagain River and is similar to the Finlay River Valley at Fort Grahame. The valley-floor is around 4 or 5 miles in width with large areas of bench land, 100 to 200 feet above the river, rising gradually back to the main slopes of the hills and mountains on either side, with, in places, many channels and back waters and, every so often, contacting and cutting into the benches along the river; a striking feature is the absence of solid rock as only in very few places where the river has cut into the higher benches is rock to be seen. For the most part it runs between earth banks and gravel-bars. The range of mountains bounding the valley on the west runs nearly straight on a bearing of N. 32° W., parallel to and 3 or 4 miles back from the river. This range carried on beyond the Turnagain, holding the same bearing, but with lower altitudes to the Earle River and beyond.

Below the Turnagain the valley opens out and the river swings to the right, passing between timbered hills around 3,500 feet altitude. Below the Earle River it turns farther to the east and passes through this range of low hills to the valley of the Liard. At the Turnagain, the river is about 4 miles from the mountains and at the Earle around 15 miles. This leaves a large area of plateau and rolling country with one hill, reaching to an altitude of 3,500 feet.

On the east side of the valley, and near the southerly end of our work, lies Terminus Mountain, the most northerly mountain of the main Rocky Mountains. The altitude of this mountain is 6,267 feet above sea-level. Down the valley the altitudes of the hills decrease until the timbered hills beyond the Turnagain are reached.

Besides the Turnagain and Earle Rivers several much smaller streams enter the valley. A few of these reach the river. The others, quite respectable streams when they leave the hills, sink into the ground and disappear in the flat bench land. Several small lakes, of which Scoop Lake, 2 miles long, is the largest, are found in the first few miles above the Turnagain, while on the plateau between the Turnagain and Earle Rivers four larger and a number of small lakes are located.

FOREST-COVER.

Above the Turnagain River spruce of 12 inches diameter is the predominating species. Poplar is found along the edge and the partially open slopes of the benches above the river and several large poplar-covered flats with widely spaced trees to 10 inches diameter were noted, and, on the west side, some park-like pine-covered stretches were found. Marshy meadows and several dry meadows with exceedingly good growth of grass were seen on the valley-floor, and good grass was general on the poplar flats and on the open side-hills. A few birch of small size are to be found scattered over the area.

Below the Turnagain more pine was noted, as were stretches of old burnt areas grown up in poplar, and many windfalls. Some tamarack of small size was also found, generally in marshy places. Willow and alder and small brush are prevalent, but not thick enough to interfere seriously with bush travelling.

A considerable variety of berries are to be found throughout the area, but nowhere were they seen in any profusion. Some strawberries, gooseberries, a few blueberries and raspberries; cranberries were somewhat more plentiful. The berries were of good size and flavour, but it could not be classed as a good berry country.

GAME.

The whole valley is taken up with registered trap-lines held by Indians, and is reported to be good fur country. Beaver, marten, fisher, otter, mink, and muskrat are

said to be common. The east side of the valley is supposed to be a good place for grizzly bear. Only one was seen, but we came across much evidence of their work. Some mountain sheep and goat on the higher mountains were encountered, and from the well-travelled game trails on the higher ridges it is evident that, at times, these animals must be common. It is the same with the moose. Their tracks, generally old, are to be found all over, but only a very few were seen. It was reported that timber-wolves are numerous, and some were seen. This probably explains the scarcity of the moose and other animals. Willow grouse and fool-hens are plentiful and many geese and some ducks were seen along the river and on the lakes. The Kechika River is known locally as the Big Muddy and the name fits, but the Turnagain is a clear-water stream and some fish, Dolly Varden and grayling, were taken from it. It is believed that in some of the larger lakes these fish are plentiful.

CLIMATE.

Very little snow was to be seen, even on the higher mountains, when we arrived in the Kechika Valley the middle of June and we were told it had been gone for some time. From Dease Lake considerable snow could be seen on the mountains visible from there, which indicates an earlier spring for the valley. From the middle of June to the end of August there was not much rain and generally warm, sunny weather. On August 29th snow covered the mountains and a heavy frost occurred. This snow disappeared and we had clear cold weather for a couple of weeks, which enabled us to finish our work and move to Lower Post.

ACCESSIBILITY.

The Moody Trail to the Yukon came over Sifton Pass and down the Kechika River to Terminus Mountain. Opposite this mountain it turned off the valley, crossed a low pass and proceeded down another valley on its way to McDame Creek and the Yukon. Where this trail leaves the valley evidences could be seen where several cabins had once stood. The trail from Fort Ware to Lower Post, a distance of 230 miles, follows the same route to Terminus Mountain, which is about half way between the posts. It keeps to the east side of the river and 40 miles below joins a trail from Fort Nelson and on to " The Crossing " of the Kechika, 66 miles from Lower Post. The trail finally leaves the river at the crossing, and at 47 miles from the post, and 8 miles up from the Kechika crosses the Earle River. A trail, which starts up the Turnagain Valley, goes through to Dease Lake. A branch of this trail reaches McDame Creek on the Dease River.

The work carried out by our parties this season completed the mapping of the Rocky Mountain Trench route of the Alaska Highway through British Columbia. Along this section there would be no difficulty encountered in constructing a road. Practically no rock-work, easy grades and plenty of road-building material. The only large bridge required would be that crossing the Turnagain and good bridge-sites are available.

TOPOGRAPHICAL SURVEY, LOWER POST.

By N. C. Stewart, B.C.L.S.

F. C. Green, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I have the honour to submit the following report on the topographical survey carried out under your instructions during the field season of 1941.

The surveys, which were in the vicinity of Lower Post, on the Liard River, controlled a strip of country averaging 12 miles in width and extending in a south-easterly direction from the north boundary of the Province some 50 miles to the Earl River, where connection was made with the surveys carried out this season by A. J. Campbell, B.C.L.S. In addition, the work was extended up the Dease River to the mouth of Blue River and down the Liard to Twenty-mile Creek. These surveys complete the mapping

of the " Trench Route " of the proposed Alaska Highway. Owing to the comparatively flat terrain, control for air photos was obtained by various methods; photo-topography, triangulation, traverses, and by the use of aneroids. A map is being prepared at a scale of one-half mile to 1 inch with a contour interval of 100 feet. The areas controlled total approximately 750 square miles.

The field party consisted of W. J. Moffatt, B.C.L.S.; A. G. Slocomb, B.C.L.S.; G. C. Emerson, instrument-man; two river-boatmen, a cook, a horse-packer, and three helpers. The area was reached via Wrangell, Telegraph Creek, and Dease Lake, where two 40-foot river-boats were built. We set out in these boats down Dease River on June 13th, arriving at the mouth of Blue River two days later. After setting a few signals we continued down-river to Lower Post, near the junction of the Dease and Liard Rivers. As much of the work was at a considerable distance back from the river pack-horses were required, and these were supplied by that veteran packer, " Skook" Davidson. During the last two weeks of the field season, Mr. A. J. Campbell and his party helped to finish the control in my area.

PHYSICAL FEATURES.

The Rocky Mountain Trench is very well defined from Finlay Forks to the confluence of the Turnagain and Kechika Rivers, near which point the mountains defining the trench get smaller and 35 miles north-west of that junction there are no more mountains, but a broad expanse of plateau country extending to the north boundary of the Province, and beyond into Yukon Territory and also both east and west along the Liard and Dease Rivers. The Earl River, which was chosen as the dividing line between the surveys of Mr. Campbell and myself, rises in Deadwood Lake and flows easterly, joining the Kechika River some 30 miles below the mouth of Turnagain. A few miles north of the Earl River remnants of glacial action running north-easterly across the trench are indicated by gravelly ridges rising from 200 to 300 feet above the average floor. Again north of these ridges for about 15 miles there is a wide wooded valley with a pleasant aspect, flanked on the westerly side by more or less regular hills, culminating in Mount Monk, but on the easterly side the hills are less conspicuous and much lower. From Mount Monk we had a grand view of the plateau country. It has the appearance of a gently rolling wooded plain, but is in fact cut up by the valleys of the Liard and Dease Rivers and numerous tributary streams and, in addition, by ancient glacial action, the moraines extending in a more or less easterly direction. An average altitude for this plateau country is 2,400 feet above sea-level.

The Liard River at Lower Post (altitude 1,900 feet) is about 800 feet wide (current, 4 to 5 miles per hour). The water is usually quite clear. The Liard rises in Yukon Territory, entering the Province some 6 miles north of its confluence with the Dease, the Provincial boundary crossing it about one-half mile above the foot of Liard Canyon. The Dease River is the principal tributary of the Liard in this section. From the mouth of the Blue River (a stream 50 feet wide) to the Liard the Dease is a swift, shallow stream 300 to 500 feet wide. At points 2 and 4 miles above the mouth of the Dease are rapids difficult to navigate. Another tributary of the Liard is the Hyland, which joins it 15 miles below the Dease. The Hyland also rises in Yukon Territory. It is a swift stream, about 150 feet wide at its mouth, and can be navigated for 50 miles. Scattered throughout the area surveyed are numerous small lakes and meadows connected by meandering creeks.

FORESTS.

The tops of the ridges and hills are wooded with pine up to 10 inches diameter and in the depressions are pine and spruce, with poplar and some birch. Poplar predominates on all southerly exposures. The birch is found mostly on side-hills flanking the Liard and Dease Rivers. Larch or tamarack was seen in swampy places. Small stands of commercial spruce, sufficient for local needs, were found along the larger rivers and in certain areas inland where forest fires had not penetrated. The plateau country has considerable underbrush, mostly alder, willow, and soapalalie, making cross-country travelling difficult, and debris from forest fires have added to this diffi-

culty. However, in areas where poplar is predominant, the going is better, and under these trees there is usually a good growth of grass, much like the bunch-grass in appearance. Wild flowers are plentiful on open ridges and in the meadows.

Wild berries, mostly strawberries, cranberries, and a few blueberries and raspberries were seen, but this is not considered a good berry country. Numerous meadows provide plenty of horse-feed. Considerable hay could be cut in the vicinity of the Davy trail, between the 19-Mile Post and the Earl River.

MINERALS.

We saw no indications of minerals; if any exist, they are deeply buried by river and glacial action. Gold can be panned in the Liard and Dease Rivers, but not in paying quantities. Some years ago the country south of Lower Post was staked for oil, but I have been unable to find out if *bona-fide* indications were ever found there.

GAME.

The area surveyed is ideal for the raising of fur-bearing animals, especially beaver. The whole of this north country is covered by registered trap-lines, many of these are carefully managed and are producing large quantities of fur. Fur-bearing animals caught here include beaver, fox, fisher, marten, otter, mink, muskrats, weasels, and squirrels. Moose and bear were seen, but are not plentiful. Wolves are numerous, possibly accounting for the lack of other game. I saw deer-tracks on the gravel-bars at the mouth of the Hyland River. Rabbits are increasing in numbers. Occasional porcupines were seen. Fool-hens and willow grouse are quite plentiful and also ducks, geese, and loons. In the fall thousands of cranes paid one-night visits on their way south. In certain lakes there were trout, an especially good lake was found near the 36-Mile Post on the Davy Trail. In the larger rivers there are grayling and trout.

CLIMATE.

We had showery weather between June 13th and July 14th, then warm, summer days until the end of August, when a heavy frost occurred and snow came on the mountain-tops south of our area. The first ten days of September were very suitable for our work, but from then on to the end of the field season, October 3rd, the weather was not good, being wet and cold with numerous snow-storms. In the opinion of local residents the climate is quite suitable for their way of life, having warm summers tempered by numerous showers, a fairly cold, steady winter with a snowfall not exceeding 2 feet in depth. The beginning of navigation depends on the ice going out on Dease Lake (for the rivers clear sooner); usually this occurs some time in May. Navigation on the Dease ends when some small lakes between Dease Lake and McDame freeze over; this may happen any time after the middle of October. During the past two winters our pack-horses wintered in the Kechika Valley, coming through in very good condition without loss. In this plateau country the flies were not as troublesome as we expected.

ACCESSIBILITY, ETC.

From the time the Hudson's Bay Company's men explored the Liard and Dease Rivers in the 1830's, these rivers have provided the chief means of access to Lower Post, which has been, for many years, the centre to which the trappers and Indians have gathered to sell their furs and buy their meagre supplies. From Lower Post the Dease River is navigated to Dease Lake, some 180 river miles; the Upper Liard is navigated some 100 miles into Yukon Territory, and the Liard down-stream for about 50 miles with safety. The Hyland River is run by power-boats 50 miles into Yukon Territory.

Also from Lower Post trails radiate. The Davy trail goes south-easterly (66 miles), crossing the Kechika River 5 miles below the mouth of the Turnagain; here it connects with trails leading southerly to Ware on the Finlay River and easterly with the trail to Rabbit River, and ultimately with trails that lead to Fort Nelson, east of the Rocky Mountains. From Lower Post trails go north-easterly into the Hyland River

country, northerly up the Liard into the Yukon Territory, and south-westerly following the left bank of the Dease River to McDame Creek. With the exception of the Davy trail, these trails were designed for packing by dog-team. During the season we cleared out about 20 miles of the Davy trail for our horses.

For some years airplanes have been landing on the river at Lower Post. The Yukon Southern Air Transport, operating in this district, found these landings hazardous, so established an airport at Watson Lake, situated in Yukon Territory, about 25 miles north-west of Lower Post. During the past season this airport has been enlarged to accommodate any kind of airplane. To get materials for this work, a road was built from Lower Post. The construction company using two bulldozers built this 26 miles of road in fourteen days.

As already stated, Lower Post is the nerve centre of the district. Here the Hudson Bay Company has a post and the Taku Trading Company a store. There are a few Indian houses, and the religious needs of the community are served by two Roman Catholic priests. Trappers, both white and Indian, within 100 miles or more, visit the post each summer, the Indians bringing their entire families, so that often there is quite a population at the post. During last summer considerable additional activity was provided by the building of the airport at Watson Lake, for Lower Post was the end of the 400-mile haul from Wrangell for all the equipment and supplies required on that work. Although quite familiar with airplanes and outboard motors, the Lower Post Indians saw for the first time an automobile and, still more amazing, a giant bulldozer in action.

The future development of this district will probably follow along the same lines as in the past. Fur-farming could be intensified. A certain amount of agriculture might be started, for very good potatoes and root vegetables are now grown in certain sheltered spots. In places on the Davy trail where there are numerous meadows, horses and cattle might be raised.

This season's field surveys completed the mapping in British Columbia of the Rocky Mountain Trench route of the proposed Alaska Highway. In this most northerly section, as in other sections which I mapped, there will be little difficulty in building a road—grades are negligible, alignment more or less straight, little or no rock-work, gravel at hand everywhere, and good sites for bridges.

TRIANGULATION CONTROL SURVEY, TURNAGAIN AND TANZILLA RIVER VALLEYS.

By Hugh Pattinson, B.C.L.S.

F. C. Green, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I have the honour to submit the following report on the above survey carried out by me under your instructions of May 22nd.

The primary object of the survey as defined in your instructions was to extend the triangulation network south-westerly from stations already established on the Turnagain River so as to make a solid connection with existing Provincial triangulation in the vicinity of Dease Lake.

Upon completion of the above, my instructions were to further extend the triangulation making a connection to two stations of Mr. Fred Nash's 1930 triangulation on the Stikine River.

The party, consisting of George A. Dickson, assistant, and five men, was organized at Telegraph Creek. Horses, twelve in number, were used for transportation purposes and these were obtained with all necessary packing equipment from the Diamond B ranch on the Stikine River.

The party left Telegraph Creek on June 3rd and the interval between that date and June 25th was utilized in the resignalling and occupation of some of Mr. John Davidson's stations along the Tanzilla River and in establishing several new ones in

such positions that they could be occupied to advantage later in the season when making connections to the Stikine River triangulation.

The original intention had been to commence operations on the Turnagain River, but snow in the passes and very wet trails made it advisable to spend the first few weeks of the season at the southern end of the work in order to give the trails a chance to dry out before taking a pack-train over them.

On June 25th the party left Dease Lake for the Turnagain River where the most northerly stations were occupied, and the work was carried on continuously in a south-westerly direction until September 25th when we returned to Telegraph Creek. Connections were made to Mr. Nash's stations, Birch and Meehaus, on the Stikine network, thus closing an extensive circuit. Altogether twenty main stations were occupied. Four geological survey stations were tied in by rays from main stations but were not occupied. Five geological stations were established as permanent parts of the main network and were given serial numbers and monumented in a similar manner to other Provincial triangulation stations. No permanent markings were found at any of the geological stations, but approximate bearings and other available information made it possible to identify stations MUD, Ear, East, and Hat. In each case a cairn about 5 feet in height had been erected and in all cases when these stations were occupied and included in our main scheme of triangulation we rebuilt and enlarged the cairns to a height of approximately 8 feet.

A connection was made by triangulation to Lot 13540 (Dalvene No. 5 Mineral Claim), one of a group in the vicinity of Thenatlodi Mountain. Lot 5470 (Tatcho Creek Indian Reserve) was also tied in by triangulation and traverse.

PHYSICAL CHARACTERISTICS OF THE UPPER TURNAGAIN AND TANZILLA RIVER VALLEYS.

Between the mouth of Tent Creek and the canyon the valley of the Turnagain River is narrow, with the mountains sloping down to within a few hundred feet of the river. From the canyon south-westerly the valley widens to some extent and there are flat areas at least a mile in width. The main tributary emptying into the Upper Turnagain is Snowdrift Creek, which heads in the Hotailuh Mountains. Three Forks Creek, Two Fish Creek, Kutcho Creek, Hard Creek, and Wheaton Creek are lesser tributaries, but these are all short mountain streams having a large spring run-off but an insignificant flow during the remainder of the year. The balance of the region covered by the season's operations is drained by the Tanzilla and Tuya Rivers and their tributaries. Neither of these rivers are of great length nor do they drain very extensive areas. Both of them flow through canyons at intervals and after leaving the mountains each drains a considerable area of plateau-like country. Their beds are rough in character with many large boulders. We had no difficulty fording either of these rivers on foot during low water periods, but it is difficult to cross them even on horseback when in flood as the current is swift and footing uncertain. Both the Tanzilla and Tuya Rivers empty into the Stikine River from the north and their points of entry are only about 12 miles apart.

The largest lakes noticed in the area covered were Hluey Lakes, situated about 4 miles north-easterly from △ Hluey, and Thenatlodi Lake, situated at the foot of Thenatlodi Mountain. The former consists of a group of several lakes, the largest being about 3 miles in length. The latter is a narrow lake, being about the same length as the largest of the Hluey Lakes. The region extending south-westerly from △ Turn and △ Thenatlodi contained between the Tanzilla and Stikine Rivers consists largely of high plateau country broken by scattered mountains of moderate height and generally rounded on top. A few small creeks drain the area and most of these were dry in September.

FOREST-COVER.

Due to the northern latitude and high average elevation of the terrain the timber is generally small and of little or no commercial value at the present time. Frequent fires have caused the destruction of large areas of jack-pine and spruce forests.

There are very few deciduous trees, although a few patches of poplar and cottonwood of limited extent were noticed. The coniferous varieties predominate with spruce and jack-pine on the lower levels and alpine balsam on the upper slopes of the mountains extending to timber-line, which in this latitude is approximately 5,000 feet above sea-level. Some very extensive fires have occurred in the area between Dease Lake and Thenatlodi Mountains and also in the vicinity of Tanzilla Butte. There are thousands of acres covered with standing fire-killed timber, mostly spruce. There appears to be little or no second growth as yet and after a few years the country will be extremely difficult to travel through owing to windfalls. Apparently the fire-killed spruce is still fairly sound at the roots and at present it is possible to pick a way through with horses without encountering much down timber. A few patches of good quality jack-pine were noticed on some of the benches along the Turnagain River. Although the average diameter would not exceed 8 inches the trees were tall and straight with few limbs.

VEGETATION.

There was an abundance of good grass for horse-feed in the vicinity of every camp and most of the area covered during the season's operations supported a fair growth of vegetation and wild grasses. A wide variety of wild berries are found in certain areas. Among those encountered were blueberries, black currants, red currants, gooseberries, raspberries, strawberries, cranberries, and saskatoons. The open hillsides produce a species of bunch-grass which affords excellent feed for horses. Tufts of deadwood were noticed on many of the hillsides having a southern exposure. This plant, which is usually found in dry localities, was particularly prevalent along the banks of the Tuya River. Most of the area may be classed as good summer range land and there are meadows large and small scattered throughout the southern part of the region covered, from which a fair amount of wild hay could be cut.

GAME AND FUR-BEARING ANIMALS.

Moose and caribou are plentiful and large numbers of each were seen during the season. The caribou were generally to be found high up in the mountains during the summer, and small herds were often encountered above timber-line, grazing near patches of snow.

Mountain-sheep of the species known as Stone's are quite numerous in the high pastures of the mountains flanking the Turnagain River.

Goat also were seen on numerous occasions. Being almost snow white they are easily discernible for a considerable distance and almost any day herds could be seen grazing on the higher slopes of the mountains.

Among the fur-bearing animals trapped are beaver, lynx, marten, fox, mink, wolverine, and muskrat. During the past trapping season beavers were the main catch of the majority of the trappers. Both black and grizzly bear were noticed on several occasions.

Of the game birds willow grouse and ptarmigan were the most numerous. Large flocks of the latter were seen almost daily above the 5,000-foot contour. Some blue grouse were noticed but they were by no means plentiful. There are fish in most of the creeks and lakes. Rainbow, Dolly Varden, and Arctic trout are found in the Turnagain River and tributaries.

CLIMATE.

Frequent showers occur even during the summer months along the Turnagain River, but they are not heavy and are usually of short duration. The average precipitation throughout the area would probably not exceed 18 or 20 inches. As one travels south-westerly towards Telegraph Creek the climate becomes drier. The weather generally is very unpredictable and severe electric storms occur with little or no warning. On three different occasions the party was forced to descend from the summit due to sudden lightning storms, accompanied by heavy downpours of hail and sleet, and in each case the weather was calm and clear when the party commenced the climb from camp. The snowfall is moderate, becoming lighter to the south-west from Dease Lake.

Probably the heaviest snowfall occurs in the Upper Turnagain Valley. Strong winds drift the snow in the open areas, particularly along the trail adjacent to Snowdrift Creek, where the country has a very bleak appearance and the wide timberless valley affords a long sweep for the winds.

ACCESSIBILITY.

Access to the region may be gained by way of either of two main routes, each of which follows the main waterways of the country to a large extent. The most convenient route is by way of Wrangell, Alaska, and up the Stikine River 187 miles to Telegraph Creek, which is the head of navigation on that river. From Telegraph Creek a road leads 72 miles to Dease Lake, from which point trails give access to various parts of the region. The principal one follows the Turnagain River to Chee House at the confluence of that river with the Kechika River; thence up the last-named river to its head at Sifton Pass, which is also the head of the Fox River. The trail then follows the Fox and Finlay Rivers to Ware, a Hudson's Bay Post situated on the banks of the Finlay River 44 miles from Sifton Pass. The other main route is from Prince George to Summit Lake, at the head of the Little Crooked River, then down that river and down the Pack and Parsnip to Finlay Forks and up the Finlay River to Ware, a total distance by river of about 350 miles. From Ware the above-mentioned trail is used.

In addition to the two principal routes mentioned above, access may be obtained by trail to Telegraph Creek from Hazelton and Atlin, but the trails from these places are in poor shape as they have not been used very much in recent years. A pack-train, however, managed to get through from Hazelton to Telegraph Creek last summer, but they reported considerable difficulties encountered due to washouts, windfalls, and other obstacles.

GENERAL.

The region has few permanent residents and most of those encountered were interested either in trapping or mining, or both.

There are two general stores at Dease Lake, which supply the needs of the limited population, and a radio station was recently constructed in that vicinity by Pan-American Airways.

The road connecting Dease Lake with Telegraph Creek was greatly improved by gravelling and widening same during the summer, and now trucks can make a trip between the two places in about six hours where formerly they took anywhere up to two days when the road was wet.

Due principally to the average high elevation of the region very few areas were noticed which would be suitable for mixed farming. Vegetables, including potatoes, are successfully grown on the Ira Day ranch near the mouth of the Tuya River. No cattle or sheep are raised in the country at present, the inhabitants depending almost entirely on moose and other wild meat. Most of the area covered during the season is good summer range and would support a large number of stock. It would probably be necessary to put up sufficient winter feed to last about five and one-half months. If a closer market were available there should be an opportunity for stock-raising on a moderate scale.

When one observes the large amount of imported edibles, such as meat, milk, eggs, vegetables, etc., which come up the Stikine River each boat-day it would seem that there should be a chance for a few farmers on well located homesteads to make a fair living. Locally grown potatoes bring at least $4 per 100 lb. With increased population a more substantial local market will be assured and considerably more interest will be taken in the farming possibilities. A limited number of horses are raised in the country, mainly for use on the pack-trail.

Placer-mining has been carried on at Wheaton Creek for several years and was continued during the past spring and summer. At the present time there are no lode mines in operation, although there are a number of recorded mineral claims in the district. A fair number of prospectors were out during the summer, but no important new discoveries have been reported.

A small sawmill in the vicinity of Telegraph Creek provides sufficient lumber for local requirements.

There are few large lakes within the limits of the season's operations. Hluey and Thenatlodi Lakes should be suitable for pontoon equipped planes to alight on if necessary. The former is surrounded by swamp.

TOPOGRAPHICAL SURVEY, GREAT CENTRAL LAKE.

By L. A. Austen-Leigh, B.C.L.S.

F. C. Green, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I herewith beg to report on the topographical surveys carried out under your instructions to the late Mr. McCaw, during the 1941 season.

The area included in those instructions, which was completed, consists of that corner of Map-sheet 92 F/7 which lies to the south-west of the Stamp River and, to the west, the unsurveyed remainder of Map-sheet 92 F/6, which includes the drainage area of Great Central Lake, the Taylor River, and the headwaters of the Kennedy River, its northern boundary being Mr. Stewart's map of Strathcona Park and the southern Mr. McCaw's work in 1940 and Mr. Jackson's in 1941.

There were available aerial photographs by the R.C.A.F. and British Columbia Forest Surveys, the triangulation of the Survey of Canada, and a number of ground photographs taken by Mr. Stewart in 1938 looking south into this area.

The work was carried out in the usual way by stations, to obtain photographic control, barometer readings and ties, the whole being bound together by triangulation.

Mr. McCaw started at Great Central Lake on June 17th, with Mr. McRae as his assistant. While the work was proceeding up Great Central Lake Mr. McCaw was taken ill and, on July 20th, he was obliged to return home.

The work was continued by Mr. McRae under the directions left by Mr. McCaw. It was hoped that Mr. McCaw would be able to return by September, but later his illness took an unexpected and deeply regretted turn for the worse. He died on August 22nd.

Under your directions I went out to the party, and on August 29th I found Mr. McRae about 4 miles up the Taylor River from the head of Sproat Lake. The work had been carried on in a satisfactory way. All but one of the necessary camera stations had been occupied and it remained to occupy some triangulation stations and to tie in some loose ends in the Stamp River section.

At this time the fine weather seemed to have broken up. The stations were high and could only be dealt with on fine days. Smoke, of which there was always a supply from the various mills in the neighbourhood, was bound to be reinforced in September by brush-burning.

In point of fact there were two days that were fine and clear till the end of the season, and these were spent on the triangulation stations of Klitsa and Cokely.

On September 27th the party was paid off.

At the foot of Great Central Lake there is a large lumber mill, and, except for recreational facilities, the only source of activity in the region is the timber. A great deal has been taken and a great deal remains. A small logging camp at the mouth of Lowry Creek, and a large one at the head of Great Central, are now at work.

The Taylor River section has not been touched, but there is a quantity of commercial timber which is, I understand, about to be logged.

Quite a few deer were seen and there are said to be fish in the lakes.

The highways of the area are the two big lakes and there is a good trail up the Taylor and over the pass to the Kennedy River.

The usual work on the maps is proceeding.

TOPOGRAPHICAL SURVEY, TOQUART AND KENNEDY RIVERS.

BY G. J. JACKSON, B.C.L.S.

F. C. Green, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to submit herewith my report on the topographical survey made by me, under your instructions, during the past summer.

The area completed is on Vancouver Island, to the north and west of Barkley Sound, consisting of the watershed of the Effingham-Toquart and Kennedy Rivers. This completes Map-sheet 92 F/3.

The area has all been covered by vertical views of the R.C.A.F. and by the British Columbia Forest Service. The triangulation was controlled by stations of the Geodetic Survey of Canada, supplemented by some British Columbia Coast triangulation stations.

The party was organized at Victoria and started work at the head of Effingham Inlet on June 13th. A pack-trail was cut up the west side of Effingham River to the forks, a distance of about 6 miles. Then it was continued up the East Fork to the head, another 6 miles. Stations were occupied on each side of the valley.

On July 13th, having finished the Effingham Valley, we moved to Toquart, where we put up several signals for future use and occupied one mountain, about 4 miles up the river.

On July 27th we moved to the head of Kennedy Lake by way of Tofino. We occupied stations on each side of Kennedy River for about 8 miles up the river, also several stations around the lake to the head of Clayoquot Arm.

On September 19th we moved back to Toquart, where Lucky triangulation station and a couple of other stations were occupied. On September 25th we broke camp and moved back to Victoria by way of Alberni.

During the season there was a great deal of fog, and this often necessitated a wait of several days at stations before there was a day sufficiently clear for our work.

The area is very mountainous. The rivers are in very narrow valleys, lying in a general north and south direction. The hills rise steeply from the rivers up to very jagged, bare rock peaks, reaching an elevation of from 4,000 to 5,000 feet. There are a number of small lakes scattered throughout the area. Then there is Kennedy Lake, which is large for an island lake. It is U-shaped and nearly 20 miles long from tip to tip of the "U." This lake is only about 15 feet in elevation above sea-level.

There are no operating mines in the area at present. Development-work is being done spasmodically on the Toquart group, a gold prospect, about 2½ miles up Lucky Creek, near Toquart, but this was not working when we were there.

On Kennedy River there are three gold mines, with considerable development-work done on them, and several other groups of claims have been staked. The Leora group, on the east side of Kennedy River, about 1 mile from the mouth and about one-quarter of a mile back from the river, is the only one where work was being done this year. This group was first staked in 1902 and has been worked intermittently since then and between 400 and 500 tons of ore shipped from it. The present owners were busy pumping out the old workings this summer and hoped to be able to start mining soon.

About 2 miles up the river from the Leora, on the east side, is another old mine, the Rose Marie. This was worked in the late nineties, and a four-stamp mill was operated for a couple of seasons. No work has been done on this recently.

About 1½ miles farther up the river, on the east side, is the Tommy K. group. This was staked in 1933 by the Kennedy Lake Gold Mines. Here quite a camp was built, consisting of a cook-house, bunk-houses, office, and work-shop, and considerable prospect-work has been done. No work was being done on this property this season. During the time they were here they built a good truck-road up the east side of the river to the mine. Unfortunately, a number of bridges across creeks have been washed out and it will require considerable work to make the road passable again. Very encouraging values in gold and silver were found here, but in narrow veins.

The area is heavily timbered and has a dense growth of typical west coast under-brush—salal, huckleberry, and rhododendron. The timber consists of hemlock, balsam,

spruce, red and yellow cedar, with scattered black and white pine. Along the north boundary of the area fir was in evidence and this increases in both abundance and quality to the north.

No logging has been done here and the timber is of commercial value at present in only a small part of this area. Fair timber extends for a couple of miles up Effingham Valley, but in a very narrow strip. In the Toquart Valley timber extends to the lake, about 3 miles up. Here there is a big percentage of cedar, of which a lot has fallen down. This should make a good shingle-bolt proposition, as the bolts could easily be floated down the river. There is fair timber up the Kennedy River for a short distance on each side, and between Kennedy Lake and Toquart Bay there is an area of well-timbered rolling hills.

The climate is very temperate, but the precipitation is heavy, being about 100 inches a year along the coast and sometimes over 300 inches back in the valleys. There is little snow on the coast, but it is heavy on the mountains. There is a great deal of fog in the summer, and it is the exception to have the mountain-tops clear of it.

The chief industry is fishing and all settlement depends on it. A large number of trollers, purse-seiners, and gill-netters operate along the coast. Canneries, salteries, and reduction plants operate at convenient points to take care of the fish. The chief catch is salmon, pilchard, and herring.

Little agriculture has been attempted, but the climate is very suitable for it, and any small fruits and garden produce do very well.

Wild blueberries were plentiful on the mountains this year, both the high and low bush varieties. Wild flowers were very plentiful, at and above timber-line there were very fine patches of Pentstemon and of yellow Erythronium and other mountain plants. Below timber-line there were many tiger-lilies, chocolate lilies, pink Erythronium and Trilliums, bog violets, peacocks, and many others.

Ducks and geese are said to be plentiful during the fall and winter in the inlets, but the local game is very scarce. Deer have practically disappeared and only the odd bear and grouse is seen. There are some fur-bearing animals, the chief catch being marten, mink, and coon, but these are not at all plentiful.

Roads and trails are scarce and most of the travelling along the coast is done by water. Ucluelet and Tofino are connected by a road. There is now a rough pack-trail up Effingham Inlet, which we cut this summer, but none of any account up the Toquart. Kennedy Lake is reached by boat from Tofino; just above salt water there are rapids, about one-quarter mile long, which necessitate the boat being pulled up by rope from the shore. A trail around the rapids is now in very bad shape, as slides have come over it. From the rapids to the lake, a distance of about 4 miles, there is little current. Kennedy River is reached by a 10-mile run along the lake. From the head of convenient navigation on the river, about a mile up from the lake, a road has been built up the east side of the river for about 4 miles. From there a rough pack-trail continues up the river and across to and down Taylor River to Sproat Lake.

Tofino and Ucluelet are the nearest towns to the district, and at both these places there are stores, a hotel, post-office, school, etc.

A telephone-line runs along the coast from Alberni to these towns. Mail service to them from Alberni is bi-weekly. The C.P.R. boat from Victoria runs every ten days in the winter and every five days during the summer months. Canada Airways run planes from Vancouver three times a week.

The work on the map is now in progress and the usual plans are being prepared.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1942.

1,125-1042-9811