PROVINCE OF BRITISH COLUMBIA

ANNUAL REPORT

OF THE

LANDS AND SURVEY BRANCHES

OF THE

DEPARTMENT OF LANDS

FOR THE

YEAR ENDED DECEMBER 31ST, 1936

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.
1937.

VICTORIA, B.C., April 5th, 1937.

To His Honour E. W. HAMBER,
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 Survey Branches of the Department of Lands for the year ended December 31st, 1936.

A. W. GRAY,
Minister of Lands.

VICTORIA, B.C., April 5th, 1937.

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 Survey Branches of the Department of Lands for the twelve months ended December 31st, 1936.

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	5
Revenue	5
Sale of Town Lots	6
Pre-emption Records	7
Pre-emption and Homestead Exchanges	7
Land-sales	7
Sale of Reverted Lands	8
Process Summary	8
Land Inspections	9
Summary	10
Letters inward and outward	11
Coal Licences, Leases, etc.	11
Crown Grants issued	11
Total Acreage deeded	11
B.C. Government Relief Land Settlement Plan	12

DEPARTMENT OF LANDS.

VICTORIA, B.C., February 1st, 1937.

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, 1936.

It is gratifying to note a substantial increase, over 26 per cent., in general revenue, notwithstanding the reduction in interest rates as from June 1st and an extensive acreage disposed of under the reverted land deferred-payment plan. As this plan has occasioned widespread attention not confined to our Province, more particularly among officials concerned with the problem of unemployment and relief, the within progress summary may be of special interest.

It will be of interest to note that Peace River District is the only part of the Province where settlers have taken advantage of the statutory provision of 1934 for exchange to more suitable locations.

I have the honour to be,

Sir,

Your obedient servant,

NEWMAN TAYLOR,
Superintendent of Lands.

STATEMENT OF REVENUE, YEAR ENDING DECEMBER 31ST, 1936.

LAND-SALES.

		Victoria.	Agencies.	Total.
Under "Coal and Petroleum Act"		.....	.....	.....
Under "Taxation Act"—				
General	$33,425.26			
Special Regulations	4,108.23			
		$37,533.49	.....	$37,533.49
Under "Land Act"—				
Townsites		411.21	$9,044.21	9,455.42
Country lands		25,801.13	13,163.64	38,964.77
Pre-empted lands		.....	515.10	515.10
Former Dominion Railway Belt lands		.....	6,770.56	6,770.56
Surface rights of mineral claims		544.35	1,261.35	1,805.70
Totals		$64,290.18	$30,754.86	$95,045.04

SUNDRY REVENUE.

Under "Land Act"—				
Sundry lease rentals		$85,410.49	.....	$85,410.49
Grazing rentals		5,288.82	.....	5,288.82
Survey fees—				
Under "Land Act"	$6,153.28			
Former Dominion Railway Belt lands	277.73			
		5,666.92	$764.09	6,431.01
Sundry fees		14,617.00	862.00	15,479.00
Royalty		500.85	.....	500.85
Improvements		3,499.14	1,066.62	4,565.76
Rent of property		416.50	180.00	596.50
Under "Taxation Act"—				
Mineral claims		56.82	4,706.08	4,762.90
Totals		$115,456.54	$7,578.79	$123,035.33

Revenue under "Coal and Petroleum Act."

	Victoria.	Agencies.	Total.
Coal licences	$5,400.00	.....	$5,400.00
Coal-lease rentals	13,982.20	.....	13,982.20
Sundry fees	5,620	.....	5,620.00
Lieu of work	450.00	.....	450.00
Totals	$25,452.20	.....	$25,452.20

Sundry Receipts.

Maps, blue-prints, etc.	$8,956.50	.....	$8,956.50
Miscellaneous	207.08	.....	207.08
Interest, Southern Okanagan Project	6,756.42	.....	6,756.42
Revenue from lands transferred from the Dominion	14,221.57	$1,741.31	15,962.88
Totals	$30,141.57	$1,741.31	$31,882.88

Summary of Revenue.

Land-sales	$64,290.18	$30,754.86	$95,045.04
Land revenue	115,456.54	7,578.79	123,035.33
"Coal and Petroleum Act"	25,452.20	.....	25,452.20
Sundry receipts	30,141.57	1,741.31	31,882.88
Totals	$235,340.49	$40,074.96	$275,415.45

Summary of Cash received.

Revenue	$235,340.49	$40,074.96	$275,415.45
"Soldiers' Land Act"—			
Southern Okanagan Project	36,565.03	.....	36,565.03
Houses, South Vancouver	303.08	.....	303.08
"Better Housing Act"—			
Principal	59,250.00	.....	59,250.00
Interest	28,784.40	.....	28,784.40
Land Settlement Board—			
Land-sales	18,002.78	.....	18,002.78
Loans	54,336.57	.....	54,336.57
Refund of advances and refund to votes, etc.	1,106.60	.....	1,106.60
Totals	$433,688.95	$40,074.96	$473,763.91

SALE OF TOWN LOTS DURING 1936.

Disposal of lots placed on the market at previous auction sales:—

1 lot at Vancouver	$15,000
12 lots at Creston	3,719
11 lots at Oliver	2,635
13 lots at Osoyoos	2,215
13 lots at Quesnel	2,470
7 lots at Erickson	945
13 lots at Castlegar	595
7 lots at Kimberley	555
And 30 lots in various townsites	1,403
Total	$29,537

During the year an auction was held at Trail, disposing of 17 lots for $3,645.

Southern Okanagan Project sold 70 parcels, comprising 479.91 acres, the purchase price being $36,935.83.

In the University Hill Subdivision in Lot 140, New Westminster District (Endowment Lands), no new sales or leases during the year, but collections on existing agreements show a considerable improvement.

PRE-EMPTION RECORDS, ETC., 1936.

Agency.	Pre-emption Records allowed.	Pre-emption Records cancelled.	Certificates of Purchase issued.	Certificates of Improvements issued.
Alberni	----	----	3	----
Atlin	----	----	2	----
Clinton	22	19	27	15
Cranbrook	1	10	28	2
Fernie	1	1	3	----
Fort Fraser	24	29	1	7
Fort George	33	64	13	18
Golden	7	1	1	----
Kamloops	14	20	23	2
Kaslo	----	----	3	----
Nanaimo	2	3	----	----
Nelson	----	----	113	3
New Westminster	30	14	171	7
Penticton	10	8	18	4
Pouce Coupe	125	231	32	26
Prince Rupert	3	6	15	----
Quesnel	43	73	48	11
Revelstoke	9	10	1	----
Smithers	4	1	5	3
Telegraph Creek	----	----	----	----
Vancouver	12	16	42	6
Vernon	4	8	20	3
Victoria	3	----	1,132	----
Totals	347	514	1,701	107

PRE-EMPTION AND HOMESTEAD EXCHANGES.

Under 1934 Amendment to "Land Act."

	No.
1934	21
1935	41
1936	21
Total	83

All of the exchanges apply to lands within the Peace River District.

LAND-SALES, 1936.

"Land Act"—	Acres.
Surveyed (first class)	60
Surveyed (second class)	3,817
	3,877
Unsurveyed	811
Total	4,688

"Taxation Act"—	
Cash and conditional sales	8,956.75
Deferred-payment settlement plan	7,512.20

1936 SALE OF REVERTED LANDS UNDER DEFERRED-PURCHASE REGULATIONS (1933).

	No.	Acreage.	Appraised Value.
Applications allowed	92	7,512.20	$28,365.00
Less abandonments	45	4,519.84	17,908.00
Totals	47	2,992.36	$10,457.00

Payments, 1936 (principal, interest, and existing improvements at date of sale) $3,595.14

PROCESS SUMMARY.

	No.	Acreage.	Appraised Value.
Total allowances since inception	697	58,489.20	$232,371.00
Less total abandonments	74	6,573.57	29,416.00
Totals	623	51,915.63	$202,955.00

	No.	
Total deposits due	399	$13,255.76
Total deposits paid and partly paid	126	4,825.36
Instalments in arrear		$8,430.40

	Per Cent.
Contracts paid in full and lands Crown-granted (approx.)	1.0
Contracts subsisting	88.4
Contracts abandoned	10.6

1936.—Reverted land applications statused and cleared for timber-sale under the "Forest Act," 414.

LAND INSPECTIONS, 1936.

Agency.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Alberni	.....	.....	.....	.....	1	.....	.....	.....	3	17	4	.....	25
Atlin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clinton	49	1	.....	5	1	9	11	8	12	36	38	64	234
Cranbrook	.....	.....	.....	.....	.....	5	9	1	10	4	1	5	35
Fernie	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Fraser	2	.....	2	1	.....	.....	62	44	49	20	3	6	189
Fort George	.....	1	.....	.....	9	23	149	87	45	58	16	.....	388
Golden	.....	.....	.....	.....	.....	.....	6	.....	1	2	35	.....	44
Kamloops	34	.....	6	6	7	19	26	36	58	30	42	16	280
Kaslo	.....	.....	.....	.....	.....	.....	.....	.....	4	1	.....	.....	5
Nanaimo	.....	.....	.....	.....	.....	2	2	2	3	.....	7	.....	16
Nelson	6	.....	.....	.....	6	3	.....	1	4	1	1	2	24
New Westminster	10	2	12	5	10	48	12	10	13	4	30	9	165
Penticton	.....	.....	1	.....	1	18	6	.....	9	3	.....	2	40
Pouce Coupe	158	65	1	1	64	42	44	141	84	249	92	42	983
Prince Rupert	9	.....	.....	.....	.....	.....	.....	6	4	1	2	1	23
Quesnel	1	.....	.....	7	1	16	15	32	97	109	38	1	317
Revelstoke	.....	.....	1	.....	1	17	42	1	21	1	6	1	91
Smithers	.....	.....	2	.....	1	.....	6	3	5	2	3	.....	22
Telegraph Creek	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Vancouver	13	1	.....	6	6	5	17	17	29	9	7	11	121
Vernon	1	1	.....	.....	5	38	11	.....	1	.....	1	.....	58
Victoria	2	.....	.....	.....	.....	.....	1	.....	.....	2	.....	1	6
Totals	285	71	26	31	113	245	419	389	452	549	326	161	3,067

SUMMARY.

	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.
Pre-emption records	824	823	1,752	1,624	1,495	969	607	664	559	447
Certificates of improvements	541	379	326	328	217	154	123	196	245	276
Certificates of purchase	778	592	747	1,067	1,152	1,735	1,739	1,452	1,379	1,850
Crown grants	1,167	1,512	1,806	1,827	1,699	1,295	1,074	1,020	1,192	1,316
Total acreage deeded	187,111	260,321	512,844	215,364	163,161	116,990	68,945	173,632	81,110	84,442
Coal-prospecting licences	71	72	112	275	160	236	95	98	102	118
Sundry leases	73	83	51	113	104	122	92	92	121	157
Coal leases	7	3	1	12	6	17	----------	----------	5	17
Revenue received	$194,435.17	$369,392.51	$251,471.25*	$428,431.64	$381,860.60	$394,454.43	$346,299.34	$322,440.16	$339,053.79	$404,534.49
Letters received	15,780	22,500	53,835†	32,180	28,951	22,857	19,381	15,591	16,901	17,739
Letters sent	12,632	12,500	18,063	19,912	22,372	16,517	14,688	10,936	12,378	15,475

	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.
Pre-emption records	413	451	524	934	2,441	1,202	485	478	343	347
Certificates of improvements	217	208	172	124	113	80	63	86	76	107
Certificates of purchase	1,831	1,731	1,448	1,432	1,444	1,254	1,211	1,903	1,490	1,701
Crown grants	1,414	1,407	1,636	1,213	1,027	795	758	1,123	1,211	1,028
Total acreage deeded	71,018	74,175	109,451	62,823	69,542	58,470	58,782	61,296.50	77,373.41	68,608.10
Coal-prospecting licences	142	104	160	235	203	137	33	83	41	54
Sundry leases	190	195	196	149	175	154	225	168	200	194
Coal leases	2	15	19	33	6	23	70	32	37	45
Revenue received	$434,213.55	$352,165.35	$618,435.93	$367,115.72	$346,339.89	$218,814.68	$201,213.80	$238,286.77	$217,822.38	$275,415.45
Letters received	19,213	19,140	18,751	21,834	26,304	26,620	25,106	26,699	22,573	21,572
Letters sent	15,537	17,806	14,839	16,581	19,153	34,402‡	22,420‡	22,217‡	18,194	19,796

* Cash received at Victoria only. † This included letters received by entire Department. ‡ Including circulars, statements, etc.

STATEMENT OF LETTERS INWARD AND OUTWARD, 1936.

Letters inward	21,572
Letters outward	19,796

Included in the above total of letters inward are general inquiry letters as follows:—

January	260	July	143
February	186	August	125
March	263	September	152
April	137	October	152
May	141	November	128
June	177	December	128

MINING LICENCES, LEASES, ETC., 1936.

Licences under the "Coal and Petroleum Act."

Original licences issued	32;	area, 17,274.00 acres.
Renewal licences issued	22;	area, 13,212.00 acres.
Totals	54;	area, 30,486.00 acres.

Leases under the "Coal and Petroleum Act."

New leases issued	5;	area, 4,795.00 acres.
Renewal leases issued	40;	area, 22,721.00 acres.
Totals	45;	area, 27,516.00 acres.

Sundry Leases under the "Land Act."

Number of leases issued	194;	area, 17,294.04 acres.

CROWN GRANTS ISSUED, 1936.

Pre-emptions	108
Dominion homesteads	159
Purchases (other than town lots)	116
Mineral claims	277
Town lots	53
Reverted lands (other than town lots)	99
Reverted town lots	75
Reverted mineral claims	122
Supplementary timber grants	2
"Dyking Assessment Act"	9
"Public Schools Act"	1
Miscellaneous	7
Total	1,028
Applications for Crown grants	1,165
Certified copies	3
Clearances of applications for leases of reverted mineral claims given	216

Total Acreage deeded.

Pre-emptions	15,399.60
Dominion homesteads	23,330.56
Mineral claims (other than reverted)	10,591.46
Reverted mineral claims	4,520.20
Purchase of surveyed Crown lands (other than town lots)	11,283.31
Purchase of reverted lands (other than town lots)	3,304.01
Supplementary timber grants	178.96
Total	68,608.10

B.C. GOVERNMENT RELIEF LAND SETTLEMENT PLAN, 1932.

VICTORIA, B.C., January 7th, 1937.

To the Deputy Minister of Lands,
Parliament Buildings, Victoria, B.C.

SIR,—I have the honour to submit herewith my report on the operation of above plan for the year 1936.

The tri-party agreement between the Dominion, the Province, and the municipalities for the purpose of carrying out the Relief Land Settlement Plan, 1932, expired in March, 1936, and was not renewed or extended; consequently, as each relief settler reached the third anniversary of his "settlement date," he automatically passed out from under the scheme, which in due course came to an end. The three-year period for the last settler was reached on October 19th, 1936.

The situation as at October 19th, 1936, with regard to the fifty families placed on the land in 1933 is as follows:—

Families sent out from Vancouver	37
Families sent out from New Westminster	13
Total	50
Farms abandoned in 1933	4
Farms abandoned in 1934	5
Farms abandoned in 1935	6
Farms abandoned in 1936	2
(From Vancouver, 15; from New Westminster, 2.)	
Total	17
Still remaining on farms and making progress—	
Vancouver	22
New Westminster	11
Total	33

Not all of those who have abandoned their farms can be classed as failures. The reasons for abandonment have been reported as follows:—

Obtained work elsewhere at more congenial occupation	3
Ill-health or death in the family	3
Definitely failed or found to be unsuitable for farm-life	11
Total	17

The allowance of $700 per family to cover a three-year period was found to be inadequate, and in the majority of cases it was found necessary to supplement this allowance from direct relief.

I have the honour to be,

Sir,

Your obedient servant,

W. S. LATTA,
Secretary B.C. Government Relief Land Settlement Committee.

PART II.

SURVEY BRANCH.

TABLE OF CONTENTS.

	PAGE.
Report of the Surveyor-General	15
General Review of Field-work	16
Office-work	17
Survey Branch	18
Table A—Summary of Office-work	18
Table B—List of Departmental Mineral Reference Maps	19
Table C—List of Departmental Reference Maps	20
Geographic Division	23
Table D—List of Lithographed Maps	25
Reports of Surveyors—	
Topographical Surveys, Cariboo District	26
Topographical Surveys, Cariboo District	28
Topographical Surveys, Vancouver Island	30
Topographical Surveys, Vancouver Island	32
Triangulation Survey in the Big Bend of the Columbia River and Canoe River Valley	34

REPORT OF THE SURVEYOR-GENERAL.

VICTORIA, B.C., February 11th, 1937.

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 Survey Branch for the year ended December 31st, 1936:—

The field-work of the Survey Branch may be divided into three main classes: (1) Triangulation, this being the best and cheapest means of determining the true position of main features and of placing a rigid foundation under all other surveys; (2) topographical surveys, now mostly carried on with the aid of aerial photography, with ground control supplied by minor triangulation and the surveying camera; (3) cadastral surveys, in preparation for settlement. Theoretically, surveys should be made in the above order, but with appropriations dependent on annual revenues, surveys for settlement must often be put first.

The appropriation made for surveys, though about one-quarter of the average of the past twenty years, took care of all urgent needs in connection with settlement, permitted a full season for the staff on the very important aero-phototopographical work, and enabled us to close a gap in our triangulation net around the Big Bend of the Columbia River, where Mr. Hallam's survey party met disaster six years ago.

Some gaps remain in the main triangulation system that should be closed as soon as funds can be provided, for until this is done the full benefit of large past expenditures cannot be reaped. Aerial photography has revolutionized topographical surveying, and our survey staff is keeping well abreast of the times in developing new methods to increase performance and to reduce costs in our rugged country. The results being secured are interesting and well worthy of study by those interested in the development of the Province on economically sound lines.

Altitude and slopes place definite limits to our agricultural areas; geological formations govern the occurrence of the various minerals; watershed areas and the drop therefrom limit power; while the potentialities of our forests are closely bound up with latitude, altitude, slopes, and drainage. Altitude and slope have a far more important bearing on economic development here than in any other Province of Canada; hence the necessity for contour-lines. With contour maps and a soil examination it can with full confidence be determined whether an area should be reserved for forest, grazing, or other purposes, or whether there is a sufficient area of suitable land to make a successful community possible, and to warrant the consequent provision of roads, schools, etc. The new maps make the best possible foundation for an inventory of resources in the areas covered, and it is my belief that the doubling of the appropriations for this topographical phase of our work would be justified by results.

So that there may be no duplication of effort, the closest co-operative contact is maintained with the various Dominion Government survey organizations operating in this Province. These include the Topographical and Air Surveys Bureau, Geological Survey, Geodetic Survey, Department of National Defence, and the Hydrographic Survey. In the belief that accurate mapping, no matter by which Government carried out, is wholly beneficial, we give all possible assistance in the way of information, land-ties, etc., to all, and in turn we have had much help from the photographic units of the Royal Canadian Air Force and from the other Ottawa departments. Under the co-operative scheme we have supplied Ottawa with full survey details and manuscript maps covering sixteen standard contoured map-sheets, and delivery of the published maps to us has commenced with the Nimpkish sheet, and other sheets are expected daily.

By Order in Council effective November 1st, 1936, effect was given to a revision of Provincial administrative boundaries which has occupied every spare hour of the time of the Surveys Branch of the Department of Lands for several years past. The effect will be a large direct yearly saving in the costs of administration, and in addition it will result in a simplification of Provincial maps and in greater convenience to the public dealing with Government offices. The boundaries affected by these changes are those of mining divisions, land recording districts, assessment and collection districts, land registration districts, and Sheriffs' jurisdictions. County boundaries in accord with the scheme were dealt with at the last session of the Legislature. Work is now proceeding on other boundaries, such as those of land districts, and these will be dealt with on completion.

In over sixty years of Provincial history, administrative districts have been established and their boundaries defined as the development of the Province demanded. Numerous changes have from time to time been made in these boundaries as the population changed and as surveys progressed and geographical knowledge increased, but these efforts were not fully co-ordinated and in recent years many discrepancies and ambiguities have been found, all of this resulting in overlapping, considerable uncertainty, some costly errors, and much waste of time. Boundaries of different systems in places where they should obviously coincide have been found to be a few miles apart, and in some instances so vaguely described that different interpretations could be put on them. This is easily understood when it is recalled that the period under review has seen millions of dollars expended on surveys, our whole system of railways and highways built up, new cities such as Vancouver, Prince George, and Prince Rupert started, and hundreds of lakes, rivers, and mountains discovered and named. The only wonder is that the confusion has not been worse and that costly mistakes have been so rare.

In the work now completed and in progress, close touch has been kept with the Dominion census authorities and much help given them, with the result that Dominion and Provincial statistics can now be combined over any area with a minimum of clerical work. A close study has been made of transportation systems, drainage areas, and convenience of access by sections of the public affected to Government offices, and an attempt has been made to look a little into the future.

On account of the rugged character of the Province, administration problems in British Columbia are more difficult and differ from those in other parts of Canada. Ten miles across a snowy mountain range may, in practice, offer greater obstacles to travel than 100 miles along a valley. On this account the principle already successfully used in the case of mining division boundaries is now being more extensively applied to other boundaries, and the divide between watersheds has largely supplanted unsurveyed meridians and parallels of latitude, with the result that any one noting which way the water flows can generally tell in what division he is.

Another object largely accomplished is to have the larger administrative units coincide in boundaries with groups of the smaller units. For example, the County of Yale will embrace exactly the Mining Divisions of Kamloops, Nicola, Vernon, Similkameen, Osoyoos, Greenwood, and Grand Forks, while Similkameen Land Recording District will embrace exactly Similkameen, Osoyoos, Greenwood, and Grand Forks Mining Divisions. Only administrative officials can appreciate the thousands of letters and public inconvenience such co-ordination will save.

Although the changes made involve the transfer of many records, this transfer has been kept as low as possible. A district active in a mining sense is seldom active in a land sense, so in active mining districts preference has been given to old mining division boundaries over former land recording district boundaries, and vice versa. It is expected that after a short period of readjustment the changes will be welcomed by those dealing with Government offices, and from comments received in the past three months it is evident that this expectation is justified.

A series of maps showing the new boundaries is now in course of preparation for publication and should be ready for distribution about March 31st. These maps, in addition to boundaries, will be up to date in all other respects and will supplant the older one-sheet maps of the Province now largely out of print. Complete descriptions of the new boundaries were published in a special issue of The British Columbia Gazette of October 19th, 1936, and large-scale maps have been supplied the Government offices mainly affected.

GENERAL REVIEW OF FIELD-WORK.

Four survey parties were engaged on aero-phototopographical control-work, two of these parties mapping in the Cariboo District east and south-east of Horsefly Lake, one in Strathcona Park, and the fourth north of Quatsino Sound. For the Vancouver Island work we had the advantage of aerial photographs taken without cost to us by the Royal Canadian Air Force.

In addition to closing the triangulation gap at the Big Bend of the Columbia River, above referred to, certain ties to the land-survey system along the Bulkley and Nechako Rivers, necessary for mapping purposes, were made.

A resurvey of the entire Hedley Townsite was made under the "Special Surveys Act," the object being to straighten out difficulties which had arisen over encroachments and the practical disappearance of the original lot stakes.

A few additional minor items were attended to, but, speaking generally, land surveys are well in advance of demand by settlers.

OFFICE-WORK.

The office staff is divided into two main sections—namely, the Survey Division and the Geographic Division. Reports compiled by F. O. Morris and by G. G. Aitken, who are respectively in charge of these Divisions, follow.

The tables show a very marked increase in office-work over the deep depression years. Improvement in the mining industry has been mainly responsible for this. About 90 per cent. of the land surveyors of the Province are in private practice, and these surveyors are responsible for the surveys of mineral claims and other classes of Crown lands. The field notes and plans of such surveys are filed in this office, and a considerable proportion of the staff is engaged in checking and replotting these surveys.

The final edition of the Quesnel pre-emptors' sheet will be available for distribution by February 15th, 1937. This map is an advance on any previous maps of this series, as we were able to incorporate in it a mass of contour information made available by our standard topographical surveys. A small-scale map for distribution by the Department of Mines and showing the new boundaries of the mining divisions will be ready in April. A revised edition of the Bulkley pre-emptors' sheet will be ready for publication about June 1st, a revision of the Southerly Vancouver Island sheet is under way, and it is hoped that a new degree sheet covering the Hope-Princeton area can be put in hand in 1937.

I have the honour to be,

Sir,

Your obedient servant,

F. C. GREEN,
Surveyor-General.

APPENDIX TO REPORT OF SURVEYOR-GENERAL.

SURVEY BRANCH.

This Branch 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. In the average day's work it is found necessary to secure and consult 100 documents from the vault. An efficient blue and ozalid printing plant is maintained.

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 Survey Branch. There are now 188 reference maps and 70 mineral reference maps, making a total of 258 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 Branch. During the year six new reference maps and five new mineral reference maps were prepared. 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 1936, SURVEY BRANCH.

Number of field-books received	350
" lots surveyed	377
" lots plotted	464
" lots gazetted	449
" lots cancelled	27
" mineral-claim field-books prepared	360
" reference maps compiled	10
" miles of right-of-way plans dealt with	10
" applications for purchase cleared	118
" applications for pre-emption cleared	448
" applications for lease cleared	410
" coal licences cleared	67
" water licences cleared	181
" timber-sales cleared	1,739
" free-use permits cleared	328
" hand-loggers' licences cleared	38
" Crown-grant applications cleared	993
" reverted-land clearances	1,178
" cancellations made	1,420
" inquiries cleared	1,661
" placer-mining leases plotted on maps	728
" letters received	5,868
" letters sent out	4,698
" Crown-grant and lease tracings made in duplicate	1,259
" miscellaneous tracings made	112
" Government Agents' tracings made	449
" blue-prints made	34,225
Revenue received from sale of blue-prints from other departments and public	$5,212.37
Value of blue-prints for Lands Department	$3,884.60
Number of documents consulted and filed in vault	29,027

TABLE B.—LIST OF DEPARTMENTAL MINERAL REFERENCE MAPS.

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

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:—

SURVEYOR-GENERAL, LANDS DEPARTMENT, VICTORIA, B.C.

Victoria, B.C., January 2nd, 1937.

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, Alberni Canal, and Great Central Lake).
1B.	West Coast, V.I. (Barkley Sound, Northerly, and Clayoquot Sound).
2.	West Coast, V.I. (Nootka District).
3.	Belize and Seymour Inlets and Smith Sound.
3A.	Quatsino Sound and West Portion of Rupert District.
3B.	Gilford, Cracroft, and Broughton Islands.
3C.	Nimpkish River Valley and Lake.
3D.	Central Portion of Rupert District.
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.	Clearwater and Murtle River Valleys.
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.

No.	Title of Reference Map.
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.
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.
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.	Euchiniko and Tetachuck Lakes.
41.	Upper Nechako River and Tachick Lake.
42.	Big Bend, Kootenay District.
42A.	Adams Lake and River.
42B.	Canoe and North Thompson River Valleys (Blue River).
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.	Nanaimo, Alberni, and adjacent Districts.
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.	Boundary Bay, Fraser River Mouth, and Point Grey. (2 in.=1 mile.)
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 Moberley 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.

No.	Title of Reference Map.
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.)
106.	Ladysmith, Nanaimo, and adjacent Islands. (2 in.=1 mile.)
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.	Trout and Upper Arrow Lakes.

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:—

SURVEYOR-GENERAL, LANDS DEPARTMENT, VICTORIA, B.C.

Victoria, B.C., January 2nd, 1937.

GEOGRAPHIC DIVISION.

MAPS.

Published.

Name.	No. of Copies.	Date of Issue.	Dept. Map No.	Scale.	Area in Sq. Miles.
Cranbrook Degree Sheet	3,600	Aug. 1936	4C	2 mi. to 1 in.	3,100
Quesnel Pre-emptors' Map, with descriptive and economic detail, second printing of "advance" edition	1,050	May, 1936	3G	3 mi. to 1 in.	9,500
Peace River Block Pre-emptors' Map	3,200	Mar., 1936	3Q	4 mi. to 1 in.	9,600

In Course of Printing.

Quesnel Pre-emptors' Map, with standard contouring, final edition	6,700	Feb., 1937	3G	3 mi. to 1 in.	9,500
Southerly Vancouver, Island temporary edition	1,200	Mar., 1937	2A	4 mi. to 1 in.	16,000
British Columbia—Commercial—					(B.C.)
Land Recording Districts	7,000	April, 1937	1JC	27 mi. to 1 in.	366,255 (B.C.)
Mining Divisions	6,000	,, 1937	1JD	27 mi. to 1 in.	366,255 (B.C.)
Assessment and Collection Districts	650	,, 1937	1JE	27 mi. to 1 in.	366,255 (B.C.)
Counties	1,050	,, 1937	1JGC	27 mi. to 1 in.	366,255 (B.C.)
Land Registration Districts	750	,, 1937	1JGL	27 mi. to 1 in.	366,255

In Course of Preparation.

Bulkley Pre-emptors' Map	.....	.....	3D	3 mi. to 1 in.	11,000
Southerly Vancouver Island, Standard edition	.....	.....	2A	4 mi. to 1 in.	16,000

The Map-mounting unit of the Department of Lands was discontinued after April 30th, 1936. On that date Mr. Edmund Sturgeon, Map-mounter, was retired from service, after completing 21½ years of service. Mr. Sturgeon came into the Provincial Service, October 14th, 1914.

Addition to Staff.—On August 1st, 1936, Mr. Thomas Hinton commenced employment as an apprentice.

GEOGRAPHIC BOARD OF CANADA, NAMING AND RECORDING.

Map-sheets, namings reviewed	13
Recommendations to Geographic Board	1,442
New names recorded	221

GEOGRAPHICAL WORK FOR OTHER DEPARTMENTS.

34 items, receipts and value of work	$3,147.26

MAP-MOUNTING.

(To April 30th, 1936.)

Work done, items	235
Revenue from departments and public	$137.95
Value of map-mounting for Lands Department, etc.	$150.75

MAP STOCK AND DISTRIBUTION.

Maps and Gazetteers issued to departments and public	12,474
Maps received into Geographic stock	9,795
Total value of printed maps and Gazetteers issued	$4,455.35
Revenue from printed maps and Gazetteers	$2,948.58

Photostat.

Total number of photostats made	2,089
Revenue from departments and public	$775.05
Value of photostats for Lands Department, etc.	$1,718.25

Letters.

Letters received and attended to	2,035

Standard Base Map.

Standard Base Map sheets (skeleton) produced	2
Plan of Cadastral Surveys, vicinity Forbidden Plateau, sheets	2
Department of the Interior sheets, Fraser Valley, compiled	9
School districts, plotted from description	32
Control nets supplied	39

Triangulation.

Main, by least-square adjustment, triangles adjusted	77
Secondary, by rectangular co-ordinates, stations	686
Index cards, records	860
Triangulation index maps	3

TABLE D.—LIST OF LITHOGRAPHED MAPS.

Map No.	Year of Issue.	Title of Map.	Scale, Miles, etc.	Per Copy.	Per Dozen.
		GEOGRAPHIC SERIES—			
1A	1933	Wall Map of British Columbia. In four sheets. Roads, trails, railways, etc.	1 : 1,000,000 15.78 m. to 1 in.	$1.50	$14.00
1A	1933	Wall Map of British Columbia. In four sheets. Roads, trails, railways, etc. Special edition showing Electoral Districts, Redistribution 1932, with 1934 Amendment	1 : 1,000,000 15.78 m. to 1 in.	2.00	20.00
†1CX	1937	British Columbia. In one sheet. Showing Land Recording Divisions	50 m. to 1 in.	Free	1.50
1EM	1930	Kootenay, Osoyoos, and Similkameen	7.89 m. to 1 in.	.50	4.00
1G	1916	Cariboo and adjacent Districts	7.89 m. to 1 in.	.50	4.00
1H	1933	Northern British Columbia, Special Mineralogical Data	1 : 1,000,000 15.78 m. to 1 in.	.50	4.00
1JCA	1923	British Columbia. In one sheet. Showing rivers, railways, main roads, trails, parks, distance charts, etc., and precipitation	31.53 m. to 1 in.	.50	4.00
†1JC	1937	Ditto ditto and Land Recording Divisions	27 m. to 1 in.	.50	4.00
†1JD	1937	Ditto ditto and Mining Divisions	27 m. to 1 in.	.50	4.00
†1JE	1937	Ditto ditto and Assessment and Collection Districts	27 m. to 1 in.	.75	6.00
†1JGL	1937	Ditto ditto and Land Registration Districts	27 m. to 1 in.	.75	6.00
†1JGC	1937	Ditto ditto and Counties	27 m. to 1 in.	.75	6.00
1K	1925	South Western Districts of B.C., Commercial and Visitors. (Economic Tables, etc., 1929.)	7.89 m. to 1 in.	.50	4.00
1L	1929	Central Districts of B.C., Commercial and Visitors	15.78 m. to 1 in.	.50	4.00
		LAND SERIES—			
†2A	1937	Southerly Vancouver Island	4 m. to 1 in.	.50	4.00
2B	1914	New Westminster and Yale Districts	4 m. to 1 in.	.50	4.00
2C	1929	Northerly Vancouver Island	4 m. to 1 in.	.50	4.00
2D	1923	Powell Lake	4 m. to 1 in.	.50	4.00
2E	1924	Bella Coola (preliminary)	4 m. to 1 in.	.50	4.00
2F	1927	Queen Charlotte Islands, Economic Geography (preliminary)	4 m. to 1 in.	.50	4.00
		PRE-EMPTORS' SERIES—			
3A	1930	Fort George	3 m. to 1 in.	One single sheet "series" free. Each sheet additional 25 cents, or	2.00
3B	1926	Nechako	3 m. to 1 in.		2.00
3C	1923	Stuart Lake	3 m. to 1 in.		2.00
†3D	1937	Bulkley Valley	3 m. to 1 in.		2.00
3E	1928	Peace River (reissue 1930)	4 m. to 1 in.		2.00
3F	1934	Chilcotin	3 m. to 1 in.		2.00
3G	1935	Quesnel (contoured)	3 m. to 1 in.		2.00
3H	1931	Tete Jaune	3 m. to 1 in.		2.00
3J	1932	North Thompson	3 m. to 1 in.		2.00
3K	1932	Lillooet	3 m. to 1 in.		2.00
3M	1929	Prince Rupert	3 m. to 1 in.		2.00
3P	1924	Grenville Channel (preliminary)	3 m. to 1 in.		2.00
3Q	1936	Peace River Block	4 m. to 1 in.		2.00
		DEGREE SERIES—			
4A	1927	Rossland Sheet (contoured)	2 m. to 1 in.	.50	4.00
4C	1936	Cranbrook Sheet	2 m. to 1 in.	.25	2.00
4D	1913	Fernie Sheet	2 m. to 1 in.	.25	2.00
4E	1925	Upper Elk River Sheet	2 m. to 1 in.	.25	2.00
4F	1913	Duncan River Sheet	2 m. to 1 in.	.25	2.00
4G	1914	Windermere Sheet	2 m. to 1 in.	.25	2.00
4H	1926	Arrowhead Sheet	2 m. to 1 in.	.25	2.00
4J	1921	Vernon Sheet (contoured)	2 m. to 1 in.	.50	4.00
4K	1923	Kettle Valley (contoured)	2 m. to 1 in.	.50	4.00
4L	1926	East Lillooet, Economic Geography (contoured)	2 m. to 1 in.	.50	4.00
4M	1927	Nicola Lake (contoured)	2 m. to 1 in.	.50	4.00
4N	1930	Penticton (contoured)	2 m. to 1 in.	.50	4.00
4P	1931	Lower Fraser Valley (preliminary)	2 m. to 1 in.	.50	4.00
		TOPOGRAPHICAL SERIES—			
5A	1916	Omineca and Finlay River Basins, Sketch-map of	5 m. to 1 in.	.25	2.00
5B	1929	Howe Sound–Burrard Inlet (contoured), South sheet (special)	½ m. to 1 in.	.50	4.00
	1929	Howe Sound–Burrard Inlet (contoured), North sheet (special)	½ m. to 1 in.	.50	4.00
5C	1929	Stikine River (contoured)	5 m. to 1 in.	.50	4.00
	1930	**GEOGRAPHICAL GAZETTEER OF BRITISH COLUMBIA**		2.00	18.00
		MINERAL REFERENCE MAPS—PRINTED.			
MRM1	1927	Slocan and Ainsworth	1 m. to 1 in.	.50	4.00
MRM2	1928	Trout Lake	1 m. to 1 in.	.50	4.00
MRM3	1928	Lardeau River	1 m. to 1 in.	.50	4.00
MRM4	1929	Nelson–Ymir	1 m. to 1 in.	.50	4.00
MRM5	1929	Rossland–Ymir	1 m. to 1 in.	.50	4.00
MRM6	1932	Grand Forks–Greenwood	1 m. to 1 in.	.50	4.00
MRM7	1934	Greenwood and Osoyoos	1 m. to 1 in.	.50	4.00
MRM8	1935	Barkerville and Lightning Creek	1 m. to 1 in.	.50	4.00
		MISCELLANEOUS—			
PWD	1934	Highway and Travel Map of B.C.	20 m. to 1 in.	.35	2.50
MD	1930	B.C. Mining Divisions and Mineral Survey Districts	50 m. to 1 in.	Free	On ap.
9	1907	Northern Interior. (A. G. Morice)	10 m. to 1 in.	.10	.50
5	1898	Kootenay District, East, Triangulation Survey of	6,000 ft. to 1 in.	.10	.50
2	1896	Kootenay District, West, Portion of	1 m. to 1 in.	.10	.50

† In course of compilation.

NOTE.—To avoid misunderstanding, applicants for maps are requested to state the "Map Number" of map desired.

We can supply information concerning maps of British Columbia printed and published at Ottawa by the Canadian Geological Survey, or the Dominion Department of the Interior, etc., etc.

Inquiries for printed maps—Address:—

CHIEF GEOGRAPHER, DEPARTMENT OF LANDS, VICTORIA, B.C. 31st December, 1936.

TOPOGRAPHICAL SURVEYS, CARIBOO DISTRICT.

By R. D. McCaw.

Victoria, B.C., December 28th, 1936.

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

Sir,—I beg to report on topographical surveys carried on by me in the Cariboo District during the past season. Your instructions, dated June 15th, stated that the area allotted to me was that embraced in Map-sheet 93 A/2, lying to the south-east of Horsefly Lake. As there were no aerial photographs for the area, photo-topographical methods were to be used, and such other methods as might be found best suited to the area, the object of the survey being to obtain sufficient information for a final map on a scale of 1 mile to 1 inch, with contours at 100-foot vertical intervals. You also instructed me that, should it be found more economical, I might cover other areas in the immediate vicinity, even should it leave some part of the main map-sheet unfinished, but that first consideration should be given to the completion of that sheet.

I left Victoria for the field on June 17th, and after making exhaustive inquiries decided to go into the area from Canim Lake. From the end of the road at Canim Lake Post-office the equipment and supplies were taken down the lake to the Hendrix Ranch at the east end by launch. The pack-horses were sent around the south side to the east end, where it was necessary to swim them. From the Hendrix Ranch a system of good pack-trails was followed northerly to a point on Martin Creek where the surveyed line (called the 52nd parallel) crosses that stream. Camp was located there. While this line is called the 52nd parallel, it is really some 3,400 feet south of the true position of that parallel, which is the south limit of Map-sheet 93 A/2. It was the intention to make this surveyed line the south limit of our surveys.

It was evident, from the information I was able to obtain, that there would be a great deal of trail-work for transportation by pack-horses, and in this regard I may say that during the summer it was necessary to cut new or open up old trails to the extent of about 40 miles. In time spread over the season this was the equivalent of the whole party working for about ten days in addition to a great deal of time expended by the packer and one or two helpers.

The general route of travel for our main camps may be followed on a reference map as follows: Starting at the 52nd parallel, the route goes up Martin Creek to Sunset Lake, over the ridge to McKinley Creek above Boss Lake, up McKinley Creek past Katharine Lake and over the divide to Deception Creek, down Deception Creek to the 52nd parallel, then retracing over trail to Boss Lake, Boss Lake to Elbow Lake, Elbow Lake to McKinley Lake, McKinley Lake to Black Creek. Side-trips were made and fly-camps located to reach outlying sections which could not be done from main camp.

The area covered will not include the entire map-sheet as it was deemed advisable to leave the south-west corner, which can be done more economically when adjoining sheets are done. At the same time information was obtained which would permit of plotting a small area in the north-east corner of Map-sheet 93 A/3, and a small area to the east of 93 A/2, as well as the portion extending south to the surveyed boundary of the 52nd parallel. By arrangement with A. J. Campbell, B.C.L.S., who was working to the north, I covered the portion in the sheet to the north in vicinity of McKinley Lake. The total area done, while it can only be given approximately now, will be about 360 square miles. It should also be noted that portions of the area have been very difficult for photo-topography or any method other than the combined method using aerial and horizontal ground photography, and parts of the resultant map, while being generally correct, will lack the exactness which we would obtain by the combined method.

The triangulation system was set out to join that of A. J. Campbell, and is an extension easterly of the triangulation of the previous year. Two former stations to the west were occupied—namely, Spokin and Black. Spokin, on a timbered ridge north of Spokin Lake, was this year established as a primary triangulation station by the Geodetic Survey of Canada. Three new main stations were chosen in my area. Boss is on the north spur of the mountain by that name and about one-quarter of a mile north of the highest point. This position was

chosen since black was not visible from the highest point. Hendrix triangulation station is on the highest point of the mountain so named by us. This feature lies between Martin Creek and Deception Creek. Church (a temporary station name) is on the highest peak (about 8,000 feet) of the high and rugged range lying south of the Crooked Lake Valley. Brass bolts were placed at all three stations, as also at four other triangulation stations of lesser importance. Galvanized-iron bars were placed at some thirty other triangulation stations. The position of all marked stations has been computed for rectangular co-ordinates, with origin at latitude 52° 00′ and longitude 121° 00′. Photographs were taken from all triangulation stations. In addition, there were numerous other photographic stations most of which are unmarked, other than by signals of some description. Positions of some of these have been calculated.

A number of connections were made to mineral-claim and timber-limit monuments and also to mile-posts on the surveyed boundary between the Cariboo and Lillooet Land Districts.

Two precise instruments reading to seconds were used for triangulation—namely a Wild transit and a Zeiss. Where great precision was unnecessary, transits reading to minutes were used. Photography was done with the old survey cameras, using Ilford panchromatic plates and a few infra-red.

With previously constructed trails and the trails we made this summer, it is possible to take pack-horses through the area from Canim Lake to the Horsefly River at Black Creek. While the trails we cut were done only with the idea of getting through, with a little more work and revision around swampy parts they will make good means for pack-horse travel. The Boss Mountain area is reached by going in by road from Lac la Hache to the west end of Murphy Lake (about 27 miles). From here a good pack-trail extends easterly to the open reaches of Boss Mountain and gives access to several mining properties in that vicinity. From Black Creek, at the end of the Horsefly–Black Creek Road, an excellent pack-trail goes in to Elbow and Cruiser Lakes, with a branch to Boss Lake, giving access to several mining properties. Unfortunately the ford across the Horsefly River is bad until flood-water is over. There is a cable and basket at this crossing, used by travellers on foot, but at present it is in poor state of repair and is not considered safe. From the east end of Canim Lake a trail northerly connects with what is known as the Clearwater Trail, starting at Canim Lake Post-office, at the upper end of that lake. From the Clearwater Trail branch trails used for many years go up Martin Creek as far as the 52nd parallel and up Deception Creek for a distance of about 8 miles within the area under survey. We continued the trail up Martin Creek and over the ridge to connect with a very poor trail along the Upper McKinley Creek. While our trail is rough, with a little more work and revision a very good route would be obtained. Between Boss Lake and Deception Creek we followed an old trail and trap-line, improving it as much as we could, but it is very swampy and poor travelling for horses. This trail connects the trail up Deception Creek with the trail going out to Black Creek.

The whole area has been pretty well prospected, but up to the present time the main scenes of such operations are on Boss Mountain and at Elbow Lake. Boss Mountain is near the west side of the sheet and is supposed to be an extinct volcano. The altitude is about 7,000 feet. Lead, zinc, copper, and molybdenum are known to exist and energetic work was being done for several months this year by the Consolidated Mining and Smelting Company on their property there. The eastern portion of the area under survey rises to an altitude of about 7,800 feet, a large extent being alpine. At the head of Deception Creek the mica-schist formation so general in this locality is very much in evidence.

The chief types of timber usually found are spruce and balsam in the valley-bottoms, and spruce, fir, and cedar, with some areas of lodgepole pine, on the lower benches and slopes up to about 4,000 feet in elevation. Spruce and balsam with some lodgepole pine run up to about 5,200 feet in altitude. Above this come the alpine growth, alpine meadows, and barren areas. That great enemy of the forest, fire, has destroyed much good timber on McKinley, Martin, and Deception Creeks. In places it seems that fire has visited the same area again and again, so that there are large extents of brulé only partly reproducing.

For detailed reports on the geology, minerals, and forestry of the area I would refer to the Report of the Pacific Great Eastern Resources Survey.

Weather conditions during the season were varied. There was a great deal of rain during the first half of July, following a very hot spell. The latter half of July was hot and dry.

This continued into August, with smoky atmosphere becoming a nuisance for photography and triangulation readings. Towards the latter part of August there occurred another rainy spell which extinguished some fires near by set by electrical storms. A very stormy period occurred between September 9th and 25th. Heavy snow fell in the high altitudes. On Boss Mountain, where I was in fly-camp from the 6th to 13th, there was considerably over a foot of snow when I left on the latter date. Most of this disappeared in about ten days, but light falls continued in the high altitudes at intervals. On the whole, atmospheric conditions for photography were only fair.

The whole area has been pretty well trapped by neighbouring settlers and Indians, so that the fur-producing animals do not seem to be very plentiful. Of the large game, moose, deer, black and brown bears seem to be quite numerous. No cariboo were seen, but there are a few. In the high eastern range goats abound and seemed quite unafraid of man. Grizzlies are said to be very numerous in the rugged areas on Deception Creek and Boss Mountain, but only a couple were seen. Big-game hunters come to this locality from all over the country and give employment to the local guides in the hunting season. Fishing is good in all lakes and streams.

The topographical information is being plotted on a scale of 40 chains to 1 inch for the ultimate reproduction of a map 1 inch to the mile.

I have, etc.,

R. D. McCAW, B.C.L.S.

TOPOGRAPHICAL SURVEYS, CARIBOO DISTRICT.

BY A. J. CAMPBELL.

VICTORIA, B.C., December 31st, 1936.

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

SIR,—I beg to submit the following report on the topographical surveys carried out by me, under your instructions, during the past season:—

Your instructions, dated June 15th, 1936, describe the area as that covered by Map-sheet 93 A/7 in the Cariboo District. This sheet extends from Quesnel Lake on the north to Crooked Lake on the south, and contains the easterly portion of Horsefly Lake, the upper part of the Horsefly River (including its branches, the North and South Forks), the Crooked River Valley, and part of McKinley Lake and Creek. With the exception of a part in the north-west corner, lying between Horsefly and Quesnel Lakes and another part extending from McKinley to Crooked Lake, the whole area is mountainous with altitudes extending from 2,380 feet above sea-level at Quesnel Lake to 8,313 feet on a mountain lying between the forks of the Horsefly River. This mountain is one of our triangulation stations and called " Head " for purposes of identification only. It will probably be given another name.

As there are no vertical aerial views covering the area, photo-topographical methods were to be used, supplemented by any other system found to be suited to the terrain. It was found that the whole area was sufficiently mountainous to obtain photographic stations from which it was possible to cover the whole area. Certain parts will be somewhat lacking in detail, principally in respect to the watercourses, due entirely to the heavy covering of forest-growth in the valleys. It is believed that sufficient information has been obtained to prepare a map on a scale of 1 mile to 1 inch with contours at 100-foot vertical intervals.

According to your instructions, we were to extend from the triangulation in the vicinity and in planning further triangulations to keep in mind the probable extension of the topographical work to the north and east. As Quesnel Lake is the natural route through to the east, it seemed suitable to establish stations that were accessible from it to the north, as well as to the south. Hence a station well north of Quesnel Lake and in such a position as to be perfectly clear to the east and north. This station is quite a distance outside our map-sheet, but on the expedition to reach it several other stations were occupied which give sufficient information to map a portion along the south boundary of Map-sheet 93 A/10. This triangu-

lation station, "Bend," north of Quesnel Lake, and "Head," previously mentioned, provide a good base from which the system may be produced easterly.

In planning the season's work, it was evident, from the information about trails and routes of travel we had, that the most central and accessible point from which to commence operations was at the mouth of Archie Creek on Horsefly Lake. Accordingly, after the party was organized at Williams Lake on June 19th, and certain established triangulation stations visited to recondition the signals, a camp was established at this point. This camp formed the hub from which the different parts of our area were reached. Across the lake lay Suey Bay, at which point it is only a little over 3 miles to Slate Bay on Quesnel Lake. An old trail led in from Suey Bay to Suey Lake, one-third of the distance across. This trail was continued through to Slate Bay. A horse-trail runs from Horsefly Lake and over Archie Pass and joins the main trail up the Horsefly Valley from Black Creek, about half a mile below the junction of the North and South Forks. This trail branches at the forks and follows up both valleys, up the North Fork about 12 miles and a similar distance up the South Fork to Fraser Creek. All these trails required considerable work to make them passable for horses. On Fritz Creek, which flows into Horsefly Lake about a mile below Archie Creek, a well-built trail follows up the creek to its head and on over what is known as Fritz Pass to Prairie Creek, and thence to the small meadow, known at Little Prairie, where it joins the main Horsefly River Trail about 7 miles from Black Creek. This trail has been kept open in part by trappers working from Horsefly Lake, otherwise it has not been used for some time.

It had been arranged with R. D. McCaw, B.C.L.S., who was to work in the area covered by Map-sheet 93 A/2, which lies directly to the south of Map-sheet 93 A/7, that, as soon as possible after going into the field, we were to erect signals on two selected triangulation points to the south of Horsefly Lake. The cairns were erected on these and a further triangulation station selected on Big Slide Mountain, lying between Archie and Fritz Creeks, south of Horsefly Lake. These, along with the triangulation station "Bend" established north of Quesnel Lake, are all the main triangulation stations established this season. Camera stations were occupied north of Quesnel Lake covering the northerly portion of our area and triangulated ties made to three posts of the Quesnel Lake survey. On Horsefly Lake ties were made to several posts of the groups of timber surveys there and other points established on the lake-shore, their positions fixed by triangulation. A point was established near the forks of the Horsefly River which should prove useful in fixing the position of any mining claims or other surveys that may be made in the vicinity. Several stations were occupied on the range between the Horsefly Lake and Horsefly River, also up the North Fork and South Fork of the Horsefly River, so that the whole area is fairly well covered. In all, some sixty-six stations were occupied, and all that were considered important enough were marked either with brass bolt cemented in rock or with the B.C.L.S. iron post. Where possible, these posts were witnessed by bearing trees in the usual manner, or else with rock cairns.

Two Wild universal transits were used throughout for the angle readings and their positions of the stations have been calculated, also the altitude of all points occupied has been found. All stations, with the exception of those established on the like-shore and in the valleys, were occupied with the camera, and thirty-five dozen panchromatic plates and a few infra-red were exposed.

The weather conditions during the season were very variable and could not be classed as good photographically. Much rain fell during the early part of July, and in September two weeks of cold weather, during which much snow and rain fell, were experienced. During this period the snow at times reached down in the valleys and the clouds were almost continually very low, making it impossible to occupy any point of reasonable altitude.

The forest-cover is indicative of a wet climate and in some respects is similar to the Coast. Spruce and balsam are the types most generally prevalent, particularly in the valleys. Along the slopes from Horsefly Lake and up into the small side-valleys, such as Archie and Fritz Creeks, considerable cedar, spruce, and some fir are located. Around the forks of the Horsefly River, and up the North Fork Valley a few miles, a peculiarly isolated stretch of jack-pine is found. With the exception of that found in the burnt areas, this is the only jack-pine noticed. The only burnt areas of any size within the limits of the map-sheet are in the comparatively flat areas, situated in the north-west and south-west parts. The part between the Horsefly and Quesnel Lakes has been burnt and reburnt, particularly on the

higher parts, where very little reproduction has commenced. Jack-pine and poplar is found in places which escaped the later burns. Beyond 5,200 feet is found the alpine growth, generally balsam, reaching up to timber-line at 6,700 feet.

The country has been well prospected, particularly on some of the branch creeks of the South Fork. Several abandoned workings on Fraser and Eureka Creeks were seen. Farther down the South Fork, on the west of the valley, other prospects were noticed on which recent work had been done.

The Pacific Great Eastern Resources Survey includes reports on the geology, minerals, and forestry of the area. Reference may be made to these for more detailed information.

The whole area is included in registered trap-lines, and from information received is a good trapping country. Big-game hunters visit the area during the seasons. It is reported to be a very good grizzly country and some were encountered by members of the party. Moose, caribou, goat, and deer are fairly plentiful. Fishing is good in the lakes and many of the streams. In Horsefly Lake rainbow trout and char of large size are caught.

Acknowledgment must be made of the courtesy of the Forest Branch, which, through your arrangement, permitted us to use their boat on Horsefly Lake. This was much appreciated, as it is the only available boat suitable for the purpose.

The map-sheets are being prepared and will be finished at the usual time.

I have, etc.,

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

TOPOGRAPHICAL SURVEYS, VANCOUVER ISLAND.

BY N. C. STEWART.

VICTORIA, B.C., December 30th, 1936.

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 according to your instructions of June 15th, 1936:—

The map-sheet controlled lies between latitudes 49° 45′ and 50° 00′ and longitudes 125° 30′ and 126° 00′. It includes the northerly half of Strathcona Park and has an area of approximately 380 square miles.

The field party consisted of W. J. Moffatt, B.C.L.S., assistant; A. G. Slocomb, instrumentman; and five men, including a cook. Two additional packers were employed for a portion of the season.

We were supplied with air photographs of the area; these were taken by the Royal Canadian Air Force in 1931. Owing to the very mountainous nature of the terrain covered by this map-sheet, the ground control was obtained solely by triangulation and ground photography.

The only means of access to this area is by the road to Upper Campbell Lake. From this lake there is a good trail to Buttle Lake, about 8 miles distant, and from Upper Campbell Lake there is also a good trail up the Elk River to Summit Lake, and an old trail, which is hard to follow, leads from Summit Lake down the Gold River to Muchulat Arm on the west coast.

After a short stay at Upper Campbell Lake we proceeded up the Elk River to the mouth of the North Fork, where we established a cache camp at a trapper's cabin. Reblazing the old trail up the North Fork, we fly-camped to Crown and Flannigan Mountains. Then proceeding farther up the Elk River we established another camp at the crossing of the Elk River near Drum Lakes. From this camp as base many trips were made to the south, west, and north, thus covering the westerly portion of the map-sheet, including the country around Mount Kings, Mount Elkhorn, Mount Foster, Donner Lake, and northerly to the 50th parallel in vicinity of Gold Lake. We made ties to the survey of the west boundary of Strathcona Park, and to a triangulation on the Gold River made by W. J. H. Holmes, B.C.L.S., in 1926.

Returning in September to our cache camp at the mouth of the North Fork, Mr. Moffatt's party proceeded up the South Branch of the Elk River, climbing the mountains to the east of

that stream. The other crew went to Buttle Lake and thence up the Wolf River as far as Mount El Piveto. We joined forces again at Buttle Lake. After occupying two peaks west of Buttle Lake and making ties to surveyed lots along the lake we returned to Upper Campbell Lake, completing the field-work at the end of September.

PHYSICAL FEATURES.

This map-sheet covers an extremely mountainous area. It is divided into two portions of varying aspect by the transverse valley containing the Elk River and the East Branch of the Gold River. To the north of this valley the mountains are lower, with rounded or flat tops, while, to the south, there are sharp jagged peaks, difficult of ascent, often rising sheer for several thousand feet. The highest mountain is Mount Elkhorn, 7,200 feet. Numerous small glaciers are found on northerly exposures. The main streams are the Campbell River out of Buttle Lake; the Elk, which joins the Campbell River in a swampy area south of Upper Campbell Lake; the branches of the Gold River which flow westerly; and along the northerly boundary of the map-sheet there are branches of the Salmon River. There are many beautiful lakes; the largest are Buttle, Upper Campbell, and Donner Lake. Crater Lake is the largest of a great number of alpine lakes. At the summit of the transverse valley are found the Drum Lakes and Summit Lake. The altitude of the summit of the pass is 1,100 feet, and as the gradient both east and west is gradual, this valley provides one of the best routes from the east coast to the west coast of Vancouver Island. The location of this pass is rather remarkable, for the highest mountains on the Island are found immediately to the south.

The mountains south of the Elk River and west of Buttle Lake compare in rugged grandeur with those found elsewhere in British Columbia. Although the tops do not much exceed 7,200 feet, the valley-floors are low; hence on the mountain-sides are found those great walls and precipices that provide the scenic splendour and make the ascents so long and arduous.

FORESTS.

All the valley-bottoms are heavily timbered; Douglas fir, red cedar, and hemlock predominate, but other varieties found include balsam, white pine, yellow cedar, cottonwood, alder, maple, and yew trees. The merchantable timber grows to an approximate altitude of 3,000 feet. The forest-growth above that level becomes stunted, timber-line being reached around 4,500 feet above the sea. Some huge Douglas fir were seen in the Elk River Valley; one measured 28 feet in circumference. In the forest there is the usual coast undergrowth of huckleberry, devil's-club, and salal. Wild flowers are abundant, especially at timber-line. Along the shores of Buttle Lake dogwoods and arbutus grow profusely, adding greatly to the beauty of its shores.

MINERALS.

There is little known mineral wealth in this area. Two mineral claims have been Crown-granted on Upper Campbell Lake; a small shaft on one of these has copper indications. Another group of claims is located on Greenstone Creek, near its crossing with the 50th parallel of latitude. Some other mining claims are located at Buttle Lake. We saw mineralized rock on tributaries of the Elk and Gold Rivers, but nothing of a striking nature. Many fossil-beds were found up the Wolf River and on the high ridge between the Wolf and the South Fork of the Elk River. During the 1935 field season we saw iron deposits on Iron Hill south of Upper Quinsam Lake. Dr. H. C. Gunning, in his report (*see* Summary Report, 1930, Part A, Geological Survey), gives geological data covering this map-sheet. He suggests areas that should be prospected, the most likely of these being in the neighbourhood of Upper Campbell Lake.

CLIMATE.

The first three weeks were very wet, but during the remainder of the field season reasonably good weather prevailed. The highest temperature, 78°, was recorded on July 19th. There was a snowfall at high altitudes on September 11th. There were very few days absolutely clear. Usually the mornings were fine and bright, while in the afternoons clouds would form along the Island's crest, making photography difficult in the southerly and easterly directions. In winter the rainfall is very plentiful in the valleys, with a corresponding large snowfall on higher levels. This snow persists on the peaks until late summer, and on the northerly slopes there are many small areas of continuous snow.

GAME.

In Strathcona Park game is not plentiful at present, though it appears, from the many well-defined game-trails, that, just a few years ago, there was an abundance. We saw black bear, deer, blue and willow grouse, and ptarmigan. There are a few elk in the Elk River watershed, for fresh tracks were seen. A cougar-hunter bagged three cougars up the Elk Valley shortly before our arrival in June. Wolves have been reported recently. Along the gravel-bars in the larger streams we saw wild geese and ducks, and also signs of beaver on the river-banks. Mink, marten, and squirrels are present, but not numerous. There are also many small birds such as robins, blue jays, etc. Trout-fishing is very good in most of the larger streams and lakes, especially so in the Upper Campbell and Buttle Lakes and in the Elk River. Dolly Varden, rainbow, and cut-throat trout are the varieties found. We saw many large salmon in the East Fork of the Gold River.

There is a notice scribed on a cedar-tree at Summit Lake stating that some members of the survey party on the west boundary of Strathcona Park, in 1914, placed some fifty trout in Summit Lake. These have multiplied, for the lake is now well stocked.

ACCESSIBILITY.

Beyond the roads and trails already mentioned, the country is very difficult and consequently unattractive to the average person. Its beauty-spots are now only accessible to the determined mountaineer, prospector, or trapper. The Elk River Timber Company has completed a railway to the lower end of Upper Campbell Lake, and are working on a grade up the Elk Valley, this new grade being completed as far as the North Fork of the Elk River.

DEVELOPMENT AND RESOURCES.

There is very little development. At an auto camp at Upper Campbell Lake, boats for fishing may be had and saddle and pack horses for the Buttle Lake Trail. Also boats may be rented at Buttle Lake. There is a privately owned lodge at both Upper Campbell and Buttle Lakes.

The chief natural resources are the forest wealth and the tourist possibilities, which can be expected when the scenic attractions and the fishing are made accessible.

From the past season's field-work it has been definitely established that a peak situated about 9 miles south of Mount Elkhorn is 20 feet higher than the latter, and is therefore the high point of Vancouver Island. Its altitude is 7,220 feet.

I have, etc.,

N. C. STEWART, B.C.L.S.

TOPOGRAPHICAL SURVEYS, VANCOUVER ISLAND.

BY G. J. JACKSON.

VICTORIA, B.C., December 31st, 1936.

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

SIR,—I have the honour to submit the following report on the photo-topographic survey made by me during the past summer:—

The area covered is on Vancouver Island and lies south of Goletas Channel, between Hardy Bay and Cache Creek. It is in Rupert District and comprises Townships 8, 21, 22, 23, 24, 33, 34, 35, 36, and portions of Townships 9, 20, 25, and 32.

The area has all been covered by vertical aerial views, taken by the Royal Canadian Air Force. The triangulation was controlled by four stations of the British Columbia triangulation system. Elevations were obtained from sea-level.

The party of seven was organized at Victoria and arrived at Port Hardy on June 11th, where work was commenced. From here we first erected signals on Shushartie and Lemon Triangulation Stations near Shushartie Bay and extended the Coast triangulation into Hardy

Bay. From June 22nd until July 17th we were camped on Kains and Nahwitti Lakes. We occupied the possible hills within reach, ten in all. Instruments and supplies had to be packed 18 miles to our farthest camp. On this trip a great deal of time was lost during heavy rains. When we came back to Port Hardy we extended the Coast triangulation westward, along Goletas Channel to Sutil Point, moving camp to Shushartie during the operation.

From Shushartie we made a trip inland to reach stations on Shushartie Ridge and Mountain, also occupied Lemon Triangulation Station, which took four days to clear of timber.

We now had camps at Nahwitti River and Cache Creek, where we occupied several stations, ran a lot of traverse, and walked many miles of survey-lines to get elevations by barometer.

On September 13th we caught the south bound boat at Shushartie, and arrived in Victoria September 15th, where the party was disbanded.

During the season thirty dozen views were taken, twenty camera stations and four triangulation stations occupied, and thirty Coast triangulation stations established and read. Views were taken from most of them. Thirty-four miles of traverse were run and sixteen ties made to land surveys. In addition, many barometer readings were taken throughout the area.

The whole area is comparatively low, as only a few of the highest hills reach an elevation of 2,000 feet. The hills are all timbered, making necessary a lot of falling to clear sufficiently for a station. There are four fair-sized lakes and a great number of small lakes and ponds. The largest is Georgie Lake, which is over 5 miles in length. The easterly 12 miles of the area drains east and north into Hardy Bay and Goletas Channel, while the remainder is drained north by the Shushartie and Nahwitti Rivers and Cache Creek. The country between Hardy Bay and Shushartie Bay and lying north of Georgie Lake is very rough, as it consists of a series of rocky hills and ravines. The rest of the area is more or less regular, with fairly gentle slopes.

Most of the area is timbered, and much, particularly near the coast, covered with a dense growth of salal and other underbrush. Between Cache Creek and Shushartie River, and also between Kains and Georgie Lakes, there are considerable areas of meadows and semi-open hillsides, which are very wet and dotted with pools of water. The soil, being clay and small boulders, seems to hold on the surface all the water that cannot drain away. The meadows are grassy, and cattle can get a living from them in summer and have even been able to stay out on them all winter.

Most of the open and semi-open country was taken up by pre-emption about twenty years ago. Cabins were built and slight improvements made. These pre-emptions are all deserted now and the cabins, in many cases, have fallen down.

Commercial timber, which is all taken up by timber limits, is limited to strips along the coast and in the valleys of the main rivers and creeks. The timber is mostly hemlock and balsam, with some spruce cedar, yellow cedar, and black pine. On most of the area the timber is small and scrubby.

As yet there is little mining activity. The H.P.H. Group, situated 4 miles west of Kains Lake, is the most active. It is a very promising silver-lead-zinc property, carrying gold values. Work has been carried on here since 1930. Other claims have been located on Nahwitti Lake and on Irony Creek, near Cache Creek. Gold has been recovered from the sands at Nahwitti River and Gold Creek.

The chief industry is the salmon-fishing, a fleet of several hundred boats operating in the vicinity. A number of the fishermen live at Hardy Bay and near-by points, while others are only there during the fishing season.

Game and fur-bearing animals are scarce. A few elk still remain in the Nahwitti and Cache Creek Valleys, and a few deer, bear, and grouse are scattered over the area. Geese nest in some of the ponds and lakes.

Salmon run up all the rivers to spawn and there are trout in most of the lakes and rivers.

The climate is very even and not subject to great extremes of heat or cold. Rainfall is heavy, even in summer. There is seldom snow at the beach, but back in the hills 1 to 2 feet may last for some time.

The town of Port Hardy has several stores and hotels, a school, etc., and is connected to the west coast by a motor-road. Boats call nearly every day on their way up and down the coast.

At Shushartie there is a store and post-office, and one boat a week, each way, calls here. From Shushartie mail is distributed by launch to points farther west on the Island. From Shushartie westward there are no people until Cache Creek, where there is one family. Then no more until Cape Scott, at the extreme west of the Island.

There is a good motor-road between Port Hardy and Coal Harbour. There is a fair pack-trail between Port Hardy and Kains Lake, which continues around the south side of Kains Lake and on to Nahwitti Lake. There are two small rowboats on Kains Lake and one on Nahwitti Lake.

There was a road built from Shushartie to Cache Creek and westward, but this is now badly grown up with brush and the bridges washed out or rotted away, so that it is only possible now as a pack-trail. There are a number of trails leading south from this road, but these have not been travelled for years and are difficult to follow.

A telephone-line connects Shushartie to Port Hardy by way of Cape Scott, Holberg Inlet, and Coal Harbour. There is also a wireless station at Bull Harbour, on Hope Island, only 6 miles by water from Shushartie.

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

I have, etc.,

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

TRIANGULATION SURVEY IN THE BIG BEND OF THE COLUMBIA RIVER AND CANOE RIVER VALLEY.

BY FRANK SWANNELL.

The season's operations consisted of closing a wide gap in the Columbia Valley triangulation and extending this system northward up the Rocky Mountain Trench, here occupied by the Canoe River, with the ultimate object of connecting through to the monuments of the Geodetic Survey of Canada in the vicinity of the Yellowhead Pass. My assistant, J. R. C. Hewett, B.C.L.S., and myself, by occupying stations set by William Hallam's party, prior to the unfortunate drowning of Mr. Hallam and two of his men in Kinbasket Lake in 1930, carried his triangulation 25 miles westward and connected rigidly with the triangulation made up the Columbia to the Big Bend, in the same year 1930. The remainder of the season we devoted to triangulating up Canoe River, occupying stations set on our way down to the Big Bend from Valemont, on the Canadian National Railway.

The Upper Canoe River Valley having been reported on by A. W. Johnson, B.C.L.S., in 1912, and more fully in 1913 by Hugh D. Allan, B.C.L.S., who surveyed much of it, nothing need here be said about it, and I shall confine my report to the area around the Big Bend of the Columbia.

COLUMBIA RIVER—KINBASKET LAKE TO MICA CREEK.

Kinbasket Lake, a widening of the Columbia, is about 7 miles long and under a mile in width. Its upper end, where the river enters in several channels, is very shallow, with extensive mud flats at low water. The conjunction of a strong wind up-lake piling waves against these shallows and against the current of the river makes this end of the lake very dangerous—it was here that Mr. Hallam's canoe was swamped and its occupants drowned. Middle River, a glacial stream with a very wide flood-bed which enters from the north halfway up the lake, has built a delta far out into the lake. As all streams entering the lake, including the Columbia itself, are clogged with glacial silt, the lake-waters never clear. Owing to this and the fact that the shores, with the exception of a sandy stretch of beach at Trident Creek, are either mud-flats or boulder-strewn, the lake has none of the attractiveness of the usual mountain lake, although it is walled in by high glacial-bearing mountains.

The river leaves the lake with a very strong draw, is barely 100 yards wide, and a quarter of a mile down-stream wild rapids commence. These are known locally as the "Twenty-one Mile" or "Long Rapids"; although by far the worst water occurs in the first 16 miles. The river is nowhere wider than 100 yards, the channel in places is constricted to 75 yards,

and its course consists of a succession of boulder-strewn rapids linked by short stretches of quieter water. The banks rise abruptly on either side, the shores at low water being narrow boulder-strewn beaches. The rapids would appear to be caused by tremendous boulders in midstream, although reef-rock was evident above Cummins Creek and in a wild rapid above Yellow Creek and in the Red Canyon Rapids. According to levels taken by the Federal Public Works Department, the fall in the first 1½ miles below Kinbasket Lake is nearly 40 feet. The next mile, including the Boulder and an unnamed rapid, falls 30 feet. From here down the fall decreases, excepting 25 feet for the ninth mile and 20 feet per mile at Yellow Creek. At Red Canyon Rapids there is 8 feet fall, with a strong riffle below. From here to the crossing of the Big Bend Bridge (270 feet between abutments) the water is good. We ran the river from Cummins Creek down with an unloaded boat, lining the Weasel Rapids above Yellow Creek. The surges were very high, but it being medium high water most of the large boulders were submerged. Most of the water above may be run by expert boatmen at the same stage of water; but walking down the shore to size up the channel before running is the only sane procedure at most of the bad places.

A short distance below the Big Bend Bridge the river widens, is split into many channels by gravel-bars and islands, particularly so at the entry of the Wood and Canoe Rivers, 1½ miles below the bridge. The mountains recede and there is a wide area of bench lands. From here to Mica Creek the river is swift, with many bars and islands, bed-rock only showing occasionally. The only bad place is above Potlatch Creek, where jutting bed-rock causes heavy swells and eddies at high water.

BOAT ENCAMPMENT AND WOOD RIVER.

Boat Encampment, on the left bank of Wood River at its junction with the Columbia, is an historic spot. David Thompson crossed the Athabaska Pass in January, 1811, and wintered there. From that date on it became an important point in the far-stretched trade route from Fort Vancouver to Hudson Bay. Governor Sir George Simpson passed here in 1825; Ermatinger, in charge of the York Factory Express, in 1827 and again in 1828, this time accompanied by the young Scots botanist, David Douglas. Paul Kane, the artist, camped here, and in 1859 came Dr. Hector, of Palliser's expedition. On some maps the name "Boat Encampment" is placed at the old ferry where the Big Bend Bridge now crosses, but there seems to be no doubt that the mouth of Wood River is the correct locality. There is a small brushy flat here and near by many very old moss-covered cedar-stumps; these crumble at the touch and may well be the remains of trees cut down from which boat-timber was split in the old fur-trade days.

CANOE RIVER FROM THE MOUTH TO HUGHALLAN RIVER.

The Canoe and the Wood enter the Columbia together, separated by a narrow, rapidly eroding point of timber; the Wood being 70 yards wide, the Canoe about 80. The waters of both are much muddier than the Columbia, those of the Canoe heavy with glittering mica-wash. The Canoe is swift, but without rapids for 11 miles up, the lower portion being broken by bars and islands and obstructed by drift-piles. Eleven miles up-stream are the Dawson (Boulder) Creek Rapids; at high water broken with heavy swells, but may be run without danger as there is plenty of water. At low water in September, just below the confluence of Dawson Creek, we were confronted with a boulder-strewn cascade in the side-channel left bank and had to portage the load and clear a channel among the boulders up which to manhaul the boat. Below Foster Creek there were nasty over-falls diagonally across the river, necessitating heavy lining in deep water. Sixteen miles up is the foot of the so-called "Canyon," where the river for a mile is contracted into one channel between high banks. It runs swiftly over small rounded boulders, causing formidable-looking waves, but there is plenty of room to clear. Between here and Hughallan (Goat) River, 32 miles from the mouth, is much swift water but no real rapids. At low water, however, it is one riffle after another and one is overboard most of the time leading or dragging the boat. Mr. Johnson, in the 1912 report, pithily states: "Below Goat River the Canoe is only navigable for expert boatmen and the less said about the navigability of the Columbia the better."

PHYSICAL CHARACTERISTICS OF THE BIG BEND AREA.

All the river-valleys described are surrounded by towering mountains. The scenery down the Canoe is superb, the river flowing in the Rocky Mountain Trench which runs straight as a tremendous gash for many hundreds of miles. From our station "Goosegrass" (7,645 feet), on the north rim of the Selkirks, we could look straight up the Canoe and see faintly the mountains beyond Tete Jaune, and even pick out Mount Robson towering highest of all. The view into the Athabaska Pass and to the north-east over the Columbia ice-field was even more wonderful.

RESOURCES.

The valley of the Lower Canoe is narrow, but wherever there is bottom land and far up the mountain-slope the timber is very heavy, spruce and cedar predominating, with considerable fir, hemlock, and balsam. There is dense undergrowth and devil's-club exactly like the Coast. There are no agricultural lands. The Columbia Valley proper from Kinbasket Lake down is also densely timbered with the same species. Below the bridge, where the valley widens and bench and bottom lands are extensive, the timber grows to a very large size, but much appeared to be overmature; much of the cedar, although attaining up to 8 feet in diameter, being of poor quality. This summer, preparatory to starting logging operations up the Canoe, several miles of road were cut from the Big Bend Bridge and a crib-work bridge thrown across Wood River. There is no mining activity at present around the Big Bend.

CLIMATE.

We experienced a wet season, but, judging by the almost coast-like luxuriance of vegetation all through the Big Bend and Lower Canoe country, probably last summer was not as wet as usual. In July rain fell on ten days. The first part of August was dry and hot, but the weather broke on the 13th and continued bad for a week. The weather broke again on September 10th, with snow falling in the mountains and heavy rains at lower levels. Altogether rain fell on eleven days in September.

GAME.

Game was not at all plentiful; a few deer and moose were seen in the Canoe Valley and an occasional goat or caribou in the mountains. Only two black bear and one grizzly were seen. Small game such as grouse and rabbits was very scarce.

Fish were very scarce in the Canoe, probably owing to its waters being full of silt and mica-wash. Only a few small trout were to be caught in the Columbia and we had no luck in Kinbasket Lake.

I have, etc.,

FRANK SWANNELL, B.C.L.S.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1937.

1,125-437-5787