REPORT

OF THE

MINISTER OF LANDS

FOR THE PROVINCE OF

BRITISH COLUMBIA

FOR THE

YEAR ENDING 31ST DECEMBER

1915

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA.

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1916.

VICTORIA, B.C., March 22nd, 1916.

To His Honour FRANK STILLMAN BARNARD,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

Herewith I beg respectfully to submit the Annual Report of my Department for the year ending December 31st, 1915.

WILLIAM R. ROSS,

Minister of Lands.

PART I.

DEPARTMENT OF LANDS.

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DEPARTMENT OF LANDS.

REPORT OF THE DEPUTY MINISTER OF LANDS.

VICTORIA, B.C., March 15th, 1916.

Hon. William R. Ross, K.C.,
Minister of Lands, Victoria, B.C.

SIR,—I have the honour to submit the Annual Report of the Department of Lands for the year ending December 31st, 1915.

It will be noted that there has been a marked curtailment throughout the year in the activities of every branch of the Department as a result of conditions induced by the war.

In the matter of land-settlement, the check has not been so marked as it has been in other directions, as for the year there were 2,277 pre-emption records issued, as against 4,304 for the previous year, which in view of the heavy enlistment for military service, taken with the depressed financial condition, should be considered fairly satisfactory. Of the records issued during the year, 1,651 were for lands which had been surveyed by the Department, and 626 were for unsurveyed areas.

An encouraging measure of success was met with in the opening to pre-emption entry of lands which had been logged over, as well as lands which, for one reason or another, had been closed against entry. In all, 699 parcels of this nature were offered to pre-emptors during the year, and 205 parcels were filed upon. During the previous year 979 parcels were opened in a similar manner, and at the close of 1915, of the total number offered, 417 parcels were taken. This left at the close of the year approximately 1,000 parcels of land of this class still available for settlement. A considerable percentage of the parcels opened were subdivided into 40-acre blocks fairly accessible to markets, but consisted of lands requiring a heavy clearing.

The reports of the Pre-emption Inspection Branch indicate satisfactory progress is being made by the pre-emptors throughout most of the land districts. In the northern section of the Province, which is being opened up by the new railway systems, there is a prevailing tendency on the part of pre-emptors to increase their acreages under cultivation, and the owners of purchase land have also made substantial improvements to their holdings with a view to escaping the wild-land tax. The suitability of a very large section of the Northern Interior for agricultural and stock-raising purposes has been convincingly demonstrated, and the next consideration to be dealt with will be the reaching of profitable markets for the products of the land. This will be a matter of first importance to the pre-emptor who, for financial reasons, is unable to equip himself for mixed farming.

The experiences of the past two years appear to justify the departure of reducing the size of pre-emptions in the timbered areas in the Coast section from 160 acres to holdings of approximately 40 acres. It ensures the pre-emptors the advantages of closer settlement, and inspections made following settlement of lands of this class establish the fact that better compliance is made with the requirements of the Statute as to residence, and much more satisfactory progress is made with the clearing of the land and the bringing of the same under cultivation. An endeavour is made to open logged lands as speedily as possible following the termination of the timber-holding title, and during the past season some 200 parcels have been surveyed and will be ready for opening to pre-emption in the spring.

Very small payments were received on account of outstanding balances on land-sales as at December 31st, 1915. The total amount outstanding on account of principal on land purchases with respect to lands which had been surveyed was $7,132,676; the total amount outstanding on account of principal in connection with lands which have yet to be surveyed is taken approximately at $1,691,652; and the amount outstanding in connection with the sale of townsite properties and suburban lands is approximately $3,167,730; or a total on account of principal under the three headings of $11,992,059.

With respect to townsite lots and surveyed lands purchased at public auction, provision was made to permit the purchaser of more than one parcel or lot to retire from one or more parcels and have the deposits paid in connection with the parcels surrendered applied in discharge of the moneys due upon the parcels to which the purchaser elects to take title. Under this arrangement small payments have been received in completing titles in a number of instances, and the total of outstanding arrears has been reduced with the surrender of a number of parcels.

Of the lands held under purchase agreement and not yet Crown-granted, 2,291,662 acres have been surveyed, and at the close of 1915 there remained unsurveyed approximately 418,064 acres, the total under this head having been reduced by the survey of 364,431 acres during the years 1914 and 1915.

Under the heading of "Land-sales" the aggregated sales for the year were 9,510 acres, of which 1,655 acres were surveyed at the time of application.

The area of Crown lands surveyed by the Department during the year 1915 was 127,000 acres, as against 1,012,000 acres surveyed during the preceding year, and the private surveys completed during the year totalled 615,300 acres, as against 1,442,200 acres surveyed in 1914.

At the close of the year 1915 the surveyed lands available for pre-emptors was computed at 2,395,980 acres. As will be seen on reference to Table D attached to the report of the Surveyor-General, the bulk of these lands are situate in the Districts of Cariboo, Lillooet, and in Ranges 4 and 5, Coast District.

The report of Professor Elliott covering the past year's operations at the dry farms in Lillooet and Nicola Districts, which is appended, has a considerable interest in connection with the development of the semi-arid areas of the Province.

I have the honour to be,
Sir,
Your obedient servant,
R. A. RENWICK,
Deputy Minister of Lands.

REPORT OF OFFICE STATISTICS.

January 7th, 1916.

R. A. Renwick, Esq.,
Deputy Minister of Lands, Victoria, B.C.

SIR,—I have the honour to submit herewith tabulated statements covering the volume of work carried out in the Department and the different land agencies in connection with the administration of the lands in the Province during the year 1915, as follows:—

(1.) Statement showing the number of pre-emption records, certificates of improvements, and certificates of purchase issued by the different agencies:
(2.) Statement of Crown grants issued, divided into the different classes of such grants; also showing the total acreage Crown-granted of pre-emptions, mineral claims, and purchased lands:
(3.) Statement of coal-prospecting licences, coal leases, and sundry leases issued, showing the money collected in connection therewith and the approximate area thereof:
(4.) Statement of land-sales, showing the area of surveyed and unsurveyed lands sold:
(5.) Statement showing the revenue received by the head office at Victoria, giving in tabulated form the amounts received each month:
(6.) Comparative statement of the different items covered by the foregoing statements since the year 1903.

I have, etc.,
JAMES MAVOR,
Secretary to Department of Lands.

PRE-EMPTION RECORDS, ETC., 1915.

	Pre-emption Records.	Certificates of Improvements.	Certificates of Purchase.
Alberni	113	99	99
Ashcroft	12	2	3
Atlin	2	...	2
Clinton	269	25	57
Cranbrook	98	6	8
Duncan	...	...	...
Fairview	79	28	35
Fort George	400	83	99
Fort Fraser	245	61	39
Fernie	9	1	10
Golden	23	13	5
Hazelton	56	31	52
Kamloops	101	54	24
Kaslo	5	2	22
Nanaimo	12	7	2
New Westminster	2	5	3
Nicola	56	24	22
Nelson	31	6	17
Prince Rupert	121	100	93
Quesnel	277	45	29
Revelstoke	6	1	39
Telegraph Creek	1	...	2
Vernon	38	17	14
Vancouver	278	53	167
Victoria	43	2	147
Totals	2,277	665	990

CROWN GRANTS ISSUED, 1915.

Pre-emptions	266
Purchase	140
Minerals	227
Town lots	36
Reverted land	7
Reverted minerals	29
"School Act"	6
Miscellaneous	7
Total	718
Applications for Crown grants	734
Certified copies of counterfoils	27

Total Acreage deeded.

Pre-emption	42,181.55
Purchase surveyed	9,592.12
Purchase unsurveyed	15,086.99
Mineral claims	8,364.34
Total	75,225.00

REPORT ON COAL LICENCES, LEASES, ETC., 1915.

COAL-PROSPECTING LICENCES.

Number Licences Issued.	Licence Fees.	Penalties.	Transfer Fees.	Area.
198	$20,000 00	$950 00	$120 00	Acres. 126,720

COAL LEASES.

Number.	Fees.	Rentals.	Total.	Area.
29	$3,219 46	$26,491 30	$29,710 76	Acres. 14,985

SUNDRY LEASES.

Number.	Fees.	Rentals.	Total.	Area.
38	$190 00	$14,346 75	$14,536 75	Acres. 2,732

LAND SALES, 1915.

	Acres.
Surveyed lands sold	1,655.00
Unsurveyed lands sold	7,855.14
Total lands sold	9,510.14

STATEMENT OF REVENUE RECEIVED, 1915.

Month.	Pre-emption Records.	Records.	Certificates of Impro'ts.	Crown Grants.	Survey Fees.	Rent of Land.	Coal Licence Fees.	Land-sales.	Miscellaneous.	Total.
January	$ 8 00	$8 00	...	$1,485 00	...	$ 4,128 04	$ 350 00	$ 1,078 37	$ 230 25	$ 7,287 66
February	2 00	6 00	$2 00	865 00	$29 25	2,261 65	4,900 00	12,658 80	110 61	20,835 31
March	8 00	6 00	...	505 00	...	1,906 80	1,800 00	1,247 45	1,051 41	6,524 66
April	...	...	2 00	1,050 00	60 00	2,000 85	3,800 00	4,897 65	958 05	12,768 55
May	2 00	2 00	...	770 00	2 47	516 15	1,100 00	991 98	243 85	3,628 45
June	28 00	2 00	...	320 00	...	2,667 75	500 00	2,393 38	263 71	6,174 84
July	8 00	4 00	...	1,255 00	...	10,377 12	500 00	3,669 36	326 28	16,139 76
August	8 00	4 00	...	430 00	...	3,368 00	2,300 00	6,073 50	152 15	12,335 65
September	6 00	2 00	...	400 00	...	4,977 03	1,400 00	3,645 70	415 02	10,845 75
October	4 00	6 00	...	1,395 00	41 75	3,978 25	650 00	7,532 11	1,116 00	14,723 11
November	4 00	8 00	...	520 00	...	3,174 41	2,200 00	2,950 49	1,313 05	10,169 95
December	6 00	6 00	...	725 00	...	1,482 00	700 00	1,825 47	130 12	4,874 59
Total	$84 00	$54 00	$4 00	$9,720 00	$133 47	$40,838 05	$20,200 00	$48,964 26	$6,310 50	$126,308 28
Monthly average	...	...	...	...	...	...	..	...	...	$10,525 69

SUMMARY.

	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
Pre-emption records	758	885	955	1,048	936	1,535	1,620	2,049	2,383	3,655	3,855	4,304	2,277
Certificates of improve't.	123	209	189	180	262	256	289	439	624	715	962	1,002	665
Certificates of purchase	510	969	1,637	1,550	3,205	2,438	4,363	9,031	7,141	5,065	3,640	1,805	990
Crown grants	860	953	1,064	1,124	1,520	1,667	1,714	1,572	2,566	2,757	2,110	1,376	718
Total acreage deeded	83,699.49	107,384.83	133,184.46	336,145.03	599,419.57	253,541.95	326,229.54	300,587.79	524,325.99	253,143.06	390,036.23	245,244.78	75,225.00
Coal-prospecting licences	434	960	508	286	426	479	692	145	2,223	2,003	1,090	545	198
Sundry leases	106	52	103	294	155	36	83	92	121	47	46	51	38
Coal leases	...	...	...	...	...	...	...	...	...	75	207	71	29
Cash received	$473,741 12	$626,070 32	$723,119 07	$1,230,754 07	$2,088,923 79	$3,065,164 43	$4,148,403 44	$3,190,416 21	$3,526,544.61	$2,525,497 29	$946,944 23	$589,687 36	$126,308 28
Letters received	14,001	15,141	16,609	19,661	29,430	33,629	25,798	37,188	41,946	43,302	31,738	30,287	19,151
Letters sent	...	...	...	...	...	...	...	...	23,568	21,612	17,305	14,790	10,104

REPORT OF THE SUPERINTENDENT OF THE INSPECTION BRANCH.

January 27th, 1916.

R. A. Renwick, Esq.,
Deputy Minister of Lands, Victoria, B.C.

SIR,—I have the honour to submit my annual report covering the work of the Inspection Branch of the Department of Lands during the year 1915.

Practically every district in the Province where any number of outstanding pre-emptions are located was visited by the Inspectors, who have carefully examined and reported upon a total number of 2,282 claims, as detailed below:—

PRE-EMPTIONS INSPECTED IN 1915.

Alberni	148	New Westminster	..
Cariboo	..	Nicola	..
Cranbrook	86	Osoyoos	274
Fernie	22	Revelstoke	7
Fort Fraser	149	Similkameen	118
Fort George	137	Skeena	307
Golden	32	Slocan	4
Hazelton	47	Vancouver	439
Kamloops	80	Victoria	66
Lillooet	272		
Nanaimo	41	Total	2,282
Nelson	53		

These reports show the value and extent of the improvements made, including buildings, slashing, clearing, fencing, ditching, etc. Considerable development is noticed in many localities and general progress is evident throughout, although the conditions prevailing have not been favourable, owing in a great measure to lack of means for the support of the pre-emptor and those depending on him while carrying on clearing and general development, a great many having to temporarily leave their claims for the purpose of obtaining employment elsewhere, both to gain means of present support and to provide capital for future development of their claims. A great many pre-emptors from all parts of the Province have also enlisted, a number being already at the front, and many more are among the various regiments being made ready for active service, while others are engaged in England and elsewhere in the manufacture of war munitions. Provision has been made for protecting these pre-emptors by leave of absence while they are away from their claims serving in any capacity connected with the war. During their absence their claims are naturally lying idle, and in consequence considerably less has been accomplished in the way of development of the land than would otherwise have taken place under normal conditions.

In view of the general depression existing and the number of pre-emptors leaving in connection with the war, the Department has been forced to exercise due care in dealing with cases of reported breach of the pre-emption regulations, and all possible discretion and the utmost leniency consistent with the requirements of the Statute has been practised in connection with such cases; consequently cancellation has only been resorted to where very flagrant disregard of the Statute has occurred.

The demand for land during the year for settlement purposes has been very fair—2,277 new records having been issued—practically every section of the Province being represented, the majority going to the Northern Interior tributary to the line of the Grand Trunk Pacific Railway, including the Fort George, Fort Fraser, Hazelton, and Prince Rupert Divisions, also the Lillooet and Cariboo Districts. This is no doubt accounted for, to a large extent, by the building of the Grand Trunk Pacific Railway and the Pacific Great Eastern Railway, which have been the means of opening up and bringing within easy reach of markets, etc., areas of good lands which were heretofore practically isolated. The surveying and mapping-out of the country, which has been carried out in recent years, has also largely assisted in this settlement. Considerable pre-emption has also taken place along the coast of the Mainland and on adjacent

islands, as well as the west coast and north end of Vancouver Island, and in the Kamloops, Similkameen, and Cranbrook Districts, and gradual progress is being made in clearing the land and bringing it under cultivation, 665 certificates of improvements having been issued by the various Land Commissioners throughout the Province, indicating that that many pre-emptors had made the necessary amount of permanent improvements to entitle them to prove up on their claims.

Continuing the system adopted for settling lapsed and cut-over timber limits, expired timber leases, and other reserved lands, considerable areas of such lands situated in various parts of the Province, the Northern Mainland Coast, Vancouver Island and adjacent islands, also in the East Kootenay District, which had previously been subdivided into 40-acre parcels and upwards, were thrown open to pre-emption during the year with a fair measure of success; those parcels most easy of access being eagerly sought for, while the demand for the more remote ones was not so great. Those which were not taken up, however, are still available, and there is no doubt they will be all settled up at no very distant date. It is anticipated that more lands of this nature will become available as the timber is cut and the limits revert to the Crown, and the system adopted of subdivision into 40-acre parcels before opening for settlement appears to be satisfactory, and there is every reason to believe that it will be the means of establishing many thriving communities throughout the country. Wherever the Inspectors have visited these settlements it is found that good progress is being made, generally in the way of clearing, cultivation, etc.

The individual reports of the Inspectors, which are submitted herewith, indicate the nature of the work accomplished, and give an idea of what is being done by the settlers in the various parts of the Province. On account of the resignation, at the beginning of the year, of G. Wallace, the Inspector for the Fort George and Cariboo Districts, who enlisted and is now at the front—no appointment having been made to fill the vacancy—it was found necessary to make a redivision of the districts among the other Inspectors, and the year's work has been carried on with one Inspector less than the previous year.

The results, however, are satisfactory, although the actual number of claims inspected is considerably less than the previous year, but this is accounted for, to a large extent, by the fact that the Inspectors have been, in addition to the regular routine work of inspecting, called upon to perform a great many duties pertaining to that office in the way of special inspection and various other matters in respect to which the Department and the local Commissioners required information in administering public affairs, which will, to a large extent, offset any apparent shortage in the returns. In view, however, of the new settlement which is taking place, thereby adding to the number of existing pre-emptions, it is doubtful whether the work can be carried on to advantage with the present staff; at least, it might be necessary to make arrangements to fill the existing vacancy.

I have also to mention the fact that J. F. Tait, clerk in this Branch, who enlisted in the 30th Battalion and left here early last year with the Canadian Forces for the front, having been wounded in the engagement at Festubert, received his discharge and has returned, resuming his duties on November 1st. Although his wound has rendered him unfit for further active service, it is gratifying to know that he was not disabled nor injured in health so as to prevent him performing his usual official duties.

During the month of August J. Hutchison, Chief Pre-emption Inspector, in company with R. E. Benedict, Chief of Operation of the Forest Branch, made a trip of investigation through the Lillooet and Cariboo Districts for the purpose of obtaining data with a view to arriving at the best policy for the administration of the public domain, having in mind the utilization, to the best advantage, of the lands for agricultural, grazing, and other purposes. While making their investigation a large number of applications to lease Crown lands, principally for grazing purposes throughout these districts, were looked into and reported upon, thus enabling the Department to dispose of the same in a comprehensive manner.

A demand having arisen for the lands remaining under reserve in the valley of the South Fork of the Fraser River in the vicinity of the town of McBride, the same were subdivided into parcels of approximately 40 acres each, and offered for sale by public auction, an upset price of $10 per acre, with improvement conditions, being placed thereon. This was considered the best means, in the public interest, of disposing of the same, as they are practically all first class and have a greater value than the ordinary waste Crown lands. The auction was held on May

25th last, but was not successful, only a small number of the parcels being sold after the auction at the upset price, and few others have been disposed of since from time to time in a similar manner. This is owing not so much to the demand having ceased as to the altered conditions, and I have no doubt that when an improvement takes place all of this land can be sold on the same terms or even at an advanced price.

I went to McBride in connection with the sale which was conducted by T. W. Herne, Government Agent for the Fort George Division, through whose office the said land is now being dealt with. On my way back I took occasion to visit the agencies at South Fort George, Fort Fraser, Hazelton, and Prince Rupert, and, at the same time, had an opportunity of seeing a good portion of that country, and was much impressed by the extent of the arable land and the possibilities for development and production which this country offers, and which, to all appearances, is bound to take place in the near future.

Selection was effected during the year of the interest accruing to the Crown in three townsite subdivisions only, all of which are small and unimportant. The activity which existed in this class of subdivision during the past few years has almost entirely subsided, which may be attributed to the altered conditions and to the fact that the supply is already greater than the demand.

In conclusion, I may state that, although a falling-off is noticed in some lines, the business of the Branch has been well up to the average, consisting not only of the ordinary routine work of dealing with the Inspectors' reports and the many questions which arise in that connection, but of a variety of matters which we are called upon from time to time to attend to.

I have, etc.,
H. CATHCART,
Superintendent, Inspection Branch.

REPORT OF THE INSPECTOR OF PRE-EMPTIONS, COAST DISTRICT.

December 24th, 1915.

H. Cathcart, Esq.,
Superintendent, Inspection Branch, Victoria, B.C.

SIR,—I have the honour to submit the following report of my operations as Inspector of Pre-emptions during the year 1915:—

On February 12th I left Vancouver to make an inspection of 40-acre lots which were recently thrown open for pre-emption near Grief Point, some three miles and a half in a south-easterly direction from Powell River. On this same trip I also made an inspection of the 40-acre lots one mile north of Powell River. Most of the lots in these two blocks are occupied by a good class of pre-emptors. They have fairly good land, which has been logged and burnt over, but it is rather heavy clearing on account of the stumps. However, these people are making good headway in the clearing of their land and seem quite contented. A few have brought in their wives and families. These pre-emptors could derive a profit from their pre-emptions in time on account of the close proximity of Powell River, which has a large paper-mill and has a population of from 1,200 to 1,500 at times.

SURGE NARROWS TO JACKSON BAY.

Upon completion of my work at Powell River, I took steamer to Heriot Bay, at which place I secured a launch and left by way of Surge Narrows and Okisollo Channel for Thurston Bay, inspecting all pre-emptions en route. At Thurston Bay I secured the Government launch "Eunice B." (which was put at my service by Mr. McKay, of the Forest Branch) and proceeded to Jackson Bay on special work for the Department. When this work was completed I left by way of Shoal Bay, Johnstone Strait, and Okisollo Rapids to Read Island, making a thorough inspection of all pre-emptions en route. The greater number of these pre-emptions are taken up by loggers and fishermen.

Clo-oose.

On March 10th I left Victoria by the steamer "Tees" for Clo-oose on a special trip of inspection. During my visit there I also made an inspection of all pre-emptions on Nitinat Lake. I found the majority of these pre-emptors had made very little headway towards cultivation, accounted for by the heavy clearing and also by the heavy rainfall.

Saltspring Island.

On March 29th I left Victoria by steamer for Ganges Harbour, Saltspring Island, and made a thorough inspection of all pre-emptions throughout the island. With the exception of several hundred acres of undulating land, situated at an altitude of from 1,500 to 2,000 feet on Musgrave Mountain, the character of the land where these pre-emptions are located is rocky, rough, and mountainous, with possibly a few acres in patches which could be brought under cultivation. I noticed that wherever cultivation has taken place, especially on Maxwell Mountain, all roots, small fruits, timothy, etc., appear to thrive well. I consider that the greater portion of these pre-emptions would make good pasture for sheep. The majority of the pre-emptors on Musgrave Mountain are making good progress on their land, having fairly good log cabins and small areas of cultivated land.

Saturna Island.

Upon completion of my work on Saltspring Island, I proceeded by steamer to Deep Cove, Saturna Island. With the exception of a small area which lies in a narrow draw between Deep Cove and Lyall Harbour, the land covered by these scattered pre-emptions is mostly rocky and mountainous, chiefly suitable for the pasture of sheep, the scattered areas of good soil on the slopes and mountains being utilized for the cultivation of roots, etc. The climate of this island is somewhat similar to that of Victoria.

Half Moon Bay.

From Saturna Island I proceeded to Half Moon Bay on special work for the Government Agent of Vancouver, and inspected several pre-emptions in that vicinity. Some of these pre-emptors have fairly good places, the soil being good, but as yet they have not made as good headway as could be expected. During my visit the pre-emptors were employed building a Government trail back to these pre-emptions, and better results may be looked for in the near future.

Texada Island.

On April 25th I had occasion to make another inspection of Texada Island, and was very much pleased to see the good results since my first inspection. The majority of the pre-emptors on the bench land have ditched their open swamps, and good results are looked for, as timothy, roots, etc., have been grown successfully in that vicinity. Some of the pre-emptors on the bush and timber land have made splendid headway in the slashing, clearing, and stumping of their land, and have built themselves good houses from logs and split cedar.

Along the Route of the Pacific Great Eastern Railway.

Upon my return from Texada Island, I left to make an inspection of the pre-emptions adjacent to the Pacific Great Eastern Railway, taking in Alki, Summit, and Green Lakes, as far as the Lillooet boundary. The difficulty of access to this country has been solved by the construction of the Pacific Great Eastern Railway. This company operates a passenger-train daily from Newport to Lillooet.

From Daisy Lake to Summit Lake the pre-emptions are scattered, as the agricultural land lies in patches in a rolling and broken country. The bottom land which lies between Summit Lake and Green Lake, consisting of about 1,500 acres, is without exception the best portion of agricultural land as far as the Lillooet boundary. Some of the pre-emptors in this district are making good improvements, especially on Green and Summit Lakes, and have built themselves good homes. I might say that a good many of the pre-emptions throughout this vicinity were taken up for the large amount of tie-timber which was on them, and others for merely speculative purposes, but this is being stopped by the system of inspection now being carried on.

SQUAMISH VALLEY.

On the completion of my inspection along the Pacific Great Eastern Railway, I returned to Brackendale and went through the Squamish Valley as far as Madden Ranch, inspecting the few scattered pre-emptions which are in this valley. I noticed while passing through that the greater portion of these bottom lands, which are especially suited for mixed farming and adapted for all roots, small fruits, hops, timothy, and clover, are covered with a second growth 10 to 15 feet high, showing that this land is no longer utilized for farming. This can be accounted for by the high values placed upon the land throughout this section of the country.

DIFFERENT ISLANDS AND CHANNELS IN RANGE 1, COAST DISTRICT.

On May 24th I left Vancouver on a special trip of inspection to the Pearce Island Group, situated in the vicinity of Alert Bay. On completion of my work there, I secured a launch and left on a cruise, taking in all the isolated pre-emptions by way of Village Island, Beware Channel, Clio Channel, and Minstrel Island, as far as Tsakonu Cove, Knight Inlet; returning by way of Minstrel Island, Chatham Channel, and Havannah Channel to Port Harvey. Upon completion of my inspection at Port Harvey, I left by way of Johnstone Strait to Blinkinsop Bay, where I inspected a few scattered pre-emptions. I then proceeded up Johnstone Strait to Cracroft Island and inspected a few pre-emptions as far as Boat Harbour, and from there returned to Alert Bay. Several of the pre-emptions visited had been taken up years ago, principally to take whatever timber was near the shore, and then were deserted. Since my inspection these records have been cancelled by the Government Agent. Most of the pre-emptions inspected have been taken up by loggers and fishermen, who have small patches of cultivated land and are making a home. There are many very pretty spots throughout these different channels with small patches of good land, and although the clearing is fairly heavy they will all in time be taken up.

TAKUSH HARBOUR AND MILLBROOK COVE.

On June 10th I left Vancouver for Takush Harbour, Smith Sound, near the entrance of Queen Charlotte Sound, and made a thorough inspection of all pre-emptions in this vicinity, as well as those at Millbrook Cove. This scrub cedar and pine land is somewhat similar to the land on the northern end of Vancouver Island, consisting of chains of partly open wet meadows, with stretches of rolling land between. The greater portion of the land taken up by the pre-emptors is agricultural land. The growth of timber is poor, being chiefly scrub cedar and pine. I am of the opinion that these lands will in time make good farming lands, but in order to bring them to a fit state of cultivation they would have to be well ditched, and a continuous working of the top soil would be necessary in order to take the acid or sourness from the ground. The rainfall on this part of the Coast is very heavy during certain seasons of the year. These pre-emptions have been taken up only a short time, consequently very little has been grown on the land as yet. From what I have observed of these pre-emptors I have no hesitation in saying that most of them will make a success of their undertaking. A good portion of them work during the fishing season for the cannery at Smith Inlet, returning to their land for the balance of the year.

CALVERT ISLAND.

From Takush Harbour I left by launch for Calvert Island, which is situated about twenty miles in a north-westerly direction from Takush Harbour. I found that the majority of the pre-emptors (some with their wives and families with them) have made splendid headway on their land, and some of them are beginning to get good results, having overcome the difficulties in draining and cultivation of the top soil. All land throughout this island is somewhat similar to that on the northern end of Vancouver Island, being wet scrub cedar and pine land, which takes two or three years to bring into a fit state of cultivation. The pre-emptors have built a good trail for a few miles up the valley for the Government, and there is a splendid wharf at which the Union Steamship Company's steamers call once a week with mail and supplies.

Bella Coola Valley.

Upon leaving Calvert Island, I took steamer to Bella Coola and made an inspection from the mouth of the Bella Coola River thirty-five miles up the valley as far as the Advent Settlement. I also inspected a number of pre-emptions from Hagensborg, eight miles up the Salloont Valley, where some of the pre-emptors are making a splendid showing in the slashing, clearing, and stumping of their land, and are cultivating the same in oats and roots. With the exception of a few scattered pre-emptions throughout the main valley of Bella Coola, the improvement to the land is not what could be expected, considering that there is a splendid road for thirty-five miles up this valley. The main object of many of the pre-emptors who took up pre-emptions years ago in this valley seems to have been to acquire as much land as possible, for, at the expiration of the allotted time required by the Act, they obtained their certificate of improvement and Crown grant and immediately took up another pre-emption. Consequently several hundreds of acres of good arable land is lying idle which otherwise could be farmed, and at the same time would make a greater and more prosperous settlement, as a market could be easily obtained for all produce at Vancouver, Prince Rupert, and the different canneries and camps along the Coast.

Cortes Island.

On July 20th I visited and made an almost complete inspection of Cortes Island. Since my first inspection of one year ago the pre-emptors as a whole have made good, and generally throughout this island seem to be a good class of settlers. They have built good dwellings, are cultivating the land in a workmanlike manner, and seem quite contented. There are several good roads and trails on this island which are of great assistance to the pre-emptors. All farm produce appears to grow well here, and poultry and hogs are raised with great success, for which a ready market is found at Powell River and Vancouver.

40-acre Lots, Okeover Arm and Lund.

On August 18th I arrived at Lund and walked through to the head of Okeover Arm, making an inspection of the 40-acre lots which were thrown open for pre-emption on May 18th, 1915. Many of these lots were taken up, but only a few of the pre-emptors were in possession. Of these, some were engaged building their cabins and slashing, while others were making trails in order to pack in to their land. These lots are generally rolling, hilly, and in patches broken with slopes which have been logged and partially burnt. I am of the opinion that fruit-trees could be grown here as the soil is sandy and gravelly.

Returning to Lund, I inspected the 40-acre lots in that vicinity, and found that the pre-emptors who have the water-front lots were all in occupation, had built good homes, and had made small slashings and clearings. The agricultural land here is limited to small areas, the balance being rocky, hilly, and broken.

After inspecting these 40-acre lots I took a launch and proceeded to inspect the pre-emptions along Desolation Sound and Homfray Channel, calling in at Melanie Cove to visit the 40-acre lots which were thrown open there for settlement on May 18th, 1915. I made no inspection or report on these lots as there was no one in occupation. I then continued along the shore of Homfray Channel as far as Forbes Bay, taking in all pre-emptions on both sides of the channel. The majority of the pre-emptors have good clearings and small patches under cultivation. The land which is available for cultivation lies in small patches, the balance being rocky and mountainous.

Saginaw, Ruby, and Killarney Lakes.

Upon completion of my work in the vicinity of Lund, I left for Pender Harbour and inspected a few scattered pre-emptions as far as the entrance to Saginaw Lake, where I secured a boat and proceeded up to the head of the lake, a distance of about six miles. From there I walked through to Ruby and Killarney Lakes and inspected all pre-emptions bordering on these lakes. The pre-emptions throughout this locality are scattered on account of the rough and hilly nature of the country. The majority of the pre-emptors have fairly good homes, although as yet they have done very little towards cultivation of the land, as this portion of the country is isolated at present, means of access being uncertain at times.

40-ACRE LOTS NEAR SECHELT.

On August 26th I arrived at Sechelt and made an inspection of the 40-acre lots which were thrown open for pre-emption on May 18th, 1915. These lots are about one mile and a half from Sechelt, which is only about thirty-five miles distant from Vancouver and is one of the favoured summer resorts. A good road, which has been of great assistance to the pre-emptors, has been built from Sechelt through these lots. The greater portion of the land covered by these lots is good agricultural land, in easy reach of the water-front and close to Sechelt, so naturally there was a great demand for them when they were thrown open. Most of the pre-emptors have made good progress in the slashing and clearing of their land, and when the inspection was made they were all in occupation. Several of them have brought their wives and families with them, have built fairly good homes, and appear to be quite satisfied.

KAINS LAKE VICINITY, RUPERT DISTRICT.

On September 15th I arrived at Hardy Bay to make an inspection of the pre-emptions in the vicinity of Kains Lake, about twelve miles westerly by trail from Hardy Bay. I was much surprised at the large amount of agricultural land I passed through, and also by the small amount of land which has been cultivated by the earlier pre-emptors during the last two years, although I must say that the pre-emptors who have taken up land during the past year are doing exceptionally well. Some of them have already slashed and cleared their 5 acres required by the Act.

VICINITY OF NAHWITTE AND SHUSHARTIE, RUPERT DISTRICT.

Upon my return to Hardy Bay, I took steamer to Nahwitte and made several special inspections there. I also made a thorough inspection of all pre-emptions south and east for a distance of eight miles from Nahwitte. The majority of the pre-emptors have made splendid headway during the past year, are observing the Act more closely, and are obtaining good results from the cultivation of their land, especially in roots.

On completion of my inspection in the Nahwitte locality, I proceeded by trail to Shushartie Bay and made an inspection of the 40-acre lots which were thrown open for pre-emption on October 17th, 1913. These are situated in Township 24, about four miles southerly from the head of Shushartie Bay. Although several of these lots were taken up, no one has resided on them on account of the difficulty of access. The trail is practically useless for future settlement on account of the steep grades which one has to overcome in order to get into this land. I am of the opinion that these lots will never be resided on until a good trail, built to grade, is made, as the difficulty of packing supplies over this steep and mountainous trail is out of the question altogether.

VARGAS ISLAND AND LOW PENINSULA.

On November 8th I left Victoria by train for Alberni, and from there proceeded by steamer to Clayoquot. There I secured a launch and made a complete inspection of Vargas Island. I found that the majority of the pre-emptors on this island have done very well, though some of them have shown very little tendency towards the cultivation of the soil, although they have built themselves fairly good homes.

The inspection of Low Peninsula from Tofino up Browning Passage to the head of Mud Bay I made by launch, and from there I proceeded along the shore of Long Beach and Wreck Bay, taking practically the same route as I did on the previous year's inspections. A great many of these pre-emptors, having obtained their certificates of improvement, have left their claims, partly on account of the hard times, as very little work can be obtained at the present time in this vicinity. Very little in the way of produce has been grown, although on a few scattered places roots of various varieties are grown with success.

40-ACRE LOTS, KENNEDY LAKE.

Leaving Long Beach, I struck inland and made a thorough inspection of the Kennedy Lake lots. These were thrown open for pre-emption on June 16th, 1914, and were mostly taken up, but on account of the lack of trails throughout this block of lots the greater portion of them

have never been occupied for any length of time, for after the pre-emptor has built his cabin he leaves his land, as the difficulty of packing in supplies and implements is in most cases too great. The clearing of the lots which lie in close proximity of Kennedy Lake is hard, the timber consisting of spruce, balsam, hemlock, and cedar. The balance of these lots are chiefly scrub cedar and pine land. The rainfall throughout this part of the country is fairly heavy.

Lasqueti Island.

On December 12th I left Nanaimo by steamer for Lasqueti Island, situated about twenty-six miles in a northerly direction from Nanaimo. Since my last visit to this island the pre-emptors generally have made fair headway with the slashing, clearing, and stumping of their land, and have got splendid results from the soil, as the land is very productive. Roots of various varieties, small fruits, fruit-trees, timothy, oats, and clover do exceptionally well, and squash and citron, etc., are also grown with great success. The Union Steamship Company's steamer "Cowichan" now makes weekly trips from Vancouver by way of Nanaimo to Lasqueti Island, and the pre-emptor is now enabled to get supplies and implements much cheaper than before. Most of the pre-emptions which have been taken up during the past year are rough, rocky, and broken, with small patches of good soil on them. The balance is a fair pasturage for sheep and a limited number of cattle. Hogs, mutton, chickens, and eggs, on a small scale, are exported and find a ready market at Nanaimo and Vancouver.

Victoria District.

During the year I have also made inspections throughout the Victoria District, including Sooke, Otter, Metchosin, Goldstream, and Highland Districts, and found that, with the exception of a few scattered pre-emptions, a much better showing had been made on the land than in the previous year. The pre-emptors are now generally in *bona-fide* occupation, have cultivated patches, and made small clearings. The land covered by these pre-emptions is mostly mountainous and rocky, with small scattered areas of swampy land, chiefly suitable for pasture, the small areas of good soil being utilized for garden, as roots, small fruits, and fruit-trees of various kinds are grown throughout these districts.

Further information regarding the characteristics of Saltspring Island, Half Moon Bay, Texada Island, Squamish Valley, Calvert Island, Bella Coola, Cortes Island, Kains Lake, vicinity of Nahwitte, Vargas Island, Lasqueti Island, and the land along the route of the Pacific Great Eastern Railway is contained in my reports of 1913 and 1914.

In the various localities I have visited in the course of my inspections small areas of scattered parcels of land may be obtained for pre-emption, but I found no large areas of Crown lands which would be available for this purpose.

During the past year I have reported on 694 pre-emptions, and have also made several special inspections for the different Government Agents in the districts which I represent.

I have, etc.,
J. W. Smith,
Inspector of Pre-emptions.

REPORT OF THE INSPECTOR OF PRE-EMPTIONS, FORT FRASER AND FORT GEORGE DISTRICTS.

January 20th, 1916.

H. Cathcart, Esq.,
Superintendent, Inspection Branch, Victoria, B.C.

Sir,—In submitting my report as Inspector of Pre-emptions for the Fort Fraser and Fort George Districts, I would first mention that from an agricultural point of view the past season has been the best in the history of the Northern Interior. The very early spring, combined with ideal conditions during the summer months, was the means of producing splendid crops of all varieties, and especially hay and oats. The latter crop, I am pleased to note (owing to the big demand in Prince George and elsewhere), has been almost entirely disposed of by the farmers

at a good figure. Hay was sold at $15 per ton and oats at $28 per ton, these rates leaving a good margin of profit to the growers. It is also hoped the farmers will succeed in finding a market for their potatoes, the crop being an exceptionally heavy one, the average yield running between 6 and 8 tons to the acre. This may be looked upon as a splendid showing, considering the land has only been under cultivation for a very few years. In parts of the Fort Fraser District ploughing was started as early as March 15th, becoming general throughout the district by April 1st. Although this was nearly three weeks earlier than any previous season, it is nevertheless quite apparent that, as the country gets settled and more land cleared and brought under cultivation, the climate rapidly changes and becomes less susceptible to frost every year. To correct an erroneous impression held by so many people, especially in the Coast cities, I would state, from personal observation and careful inquiries made throughout the different sections visited, that the only frost recorded during the past summer occurred on May 14th, doing little or no damage, as the crops at that time were only slightly advanced.

During the past year there were about 400 claims recorded in the Fort George District and about 245 in the Fort Fraser District. Although this is a considerable falling-off from the preceding year, it is, however, a good showing, considering the general depression prevailing throughout the country at the present time. It is gratifying to note that the majority of the pre-emptions recorded were by experienced farmers from the Prairies, many of whom brought their families along, together with machinery, horses, cattle, etc., with the intention of making permanent homes for themselves. It is this class of settlers that the country is mostly in need of, it being very noticeable that many of the pre-emptors holding land at present, although having the best of intentions, are not practical farmers. Consequently there is not as much development shown as there otherwise would have been. Another factor which helped to retard the progress of the country was lack of transportation, but since the completion of the Grand Trunk Pacific Railway, which has greatly reduced the cost of all commodities, there will undoubtedly be a much greater showing made in the future.

During the past season a larger acreage has been brought under cultivation than formerly. This applies more particularly to the older residents, many of whom were able, through the high prices obtained for their produce during the construction of the Grand Trunk Pacific Railway, to accumulate sufficient money to purchase up-to-date machinery, thereby enabling them to bring their land under cultivation at a minimum of cost. It is quite apparent that the high tax placed on wild land by the Government is beginning to take effect, judging from the activity shown by a number of the purchasers of large areas, who realize, no doubt, that it is far more profitable to improve their holdings, thereby making the land self-supporting.

Among the purchasers who are making extensive improvements is Mr. Bostrom, the well-known railroad contractor, who has acquired a large area on the north side of Iatalaska Lake, situated midway between Francois and Ootsa Lakes. It is Mr. Bostrom's intention to go in extensively for mixed farming, and particularly the raising of cattle. During the past seven months a big force of men have been given steady employment erecting suitable dwellings, barns, stables, etc. In clearing the land Mr. Bostrom intends using up-to-date methods, having installed a large donkey-engine for that purpose, and he expects to have at least 100 acres under cultivation during the coming summer, the land being lightly timbered. The Nechako Land Company, who have large holdings in the vicinity of the town of Vanderhoof, are also making big improvements. Besides erecting numerous large buildings, they have cleared and fenced during the past year over 300 acres. I am informed by Dr. Evans, the local manager, that it is the intention of the company to clear at least 600 acres, all of which they propose bringing under cultivation as soon as possible.

My work in the Fort Fraser District during the past summer consisted principally in revisiting the same sections of country described in my report of last year, the only exception being the Stuart River District, which I visited early in June. Through the kindness of Mr. Stevens, the Fire Warden, I was able to make the trip down Stuart River for a distance of forty miles by launch. The river, as a general thing, is a shallow, slow-running stream and navigable for boats of light draught at all stages of water; that is to say, for a distance of forty-five miles from its source. Below this point a series of canyons are met with, rendering navigation with motor-boats a very difficult matter. The land along and immediately adjacent to Stuart River, consisting principally of bottom land, is very limited in extent, nearly all of which has already been taken up. However, back from the river for a distance of three to four miles

on both the north and south sides there are large areas still open for pre-emption. These areas consist principally of level and high rolling bench land, lightly timbered and interspersed with numerous open meadows, many of which contain a luxuriant growth of wild grasses. This applies more particularly to the land on the north side of the river. At present there are only twelve pre-emptors located here, owing, no doubt, to the great difficulty one has in getting into the country. Besides the river route, the only other means of access is by a very indifferent trail twenty miles in length. The Government, however, is contemplating building a wagon-road from near the town of Vanderhoof to a point on the river known as the old ferry landing. On the completion of this road a large influx of settlers may be looked for.

Fort George District.

Upon arriving in Fort George early in July to assume my duties in that district, I was engaged for a considerable length of time making special trips for the Government Agent to various pre-emptions scattered throughout the district. On the completion of this work I took up the general inspection of the claims situated in the vicinity of Chief, Hoodoo, and Ness Lakes, and likewise Salmon River. As this section of the country, as well as the whole of the Fort George District, has been most adequately described in Mr. Wallace's reports of 1913-14, I will not attempt to make any further remarks in that direction. The Government is at present constructing a bridge across the Nechako River to replace the ferry, which is found inadequate for the requirements of the settlers located in the above-mentioned districts. Besides the bridge, which will be a great boon to the settlers generally, large sums of money have been spent in extending the wagon-roads, notably to Giscome Portage, Hoodoo and Ness Lakes. Although a great number of pre-emptions have been taken up here, there has been very little actual development owing to most of the pre-emptors being men of very small means. Since more wagon-roads have been supplied a much better showing may be looked for. The settlers generally are engaged in growing vegetables in a small way.

In the vicinity of Salmon River and along the projected route of the Pacific Great Eastern Railway to the Peace River it is proposed establishing a colony of Mennonites. These people are at present located in Saskatchewan, but, owing to the severe winters, are in quest of a more congenial climate. Mr. Seal, the representative of this colony and who visited the district last fall, is very much impressed with the country for mixed farming and has decided to locate here. As the Mennonites are known to be expert farmers and likewise good settlers, their coming will be quite an acquisition to the district. The whole of the Fort George District was undoubtedly at one time very heavily timbered, judging from numerous large stumps and down timber that is to be seen in the burnt-over areas.

The soil generally is of a lighter nature than that of the Nechako Valley, being a dansy chocolate loam with a clay subsoil.

For the benefit of intending settlers, I will enumerate the different kinds of vegetables observed growing throughout the various localities I have visited; that is to say, within a radius of twenty miles of the town of Prince George and 200 miles east through the Fraser River and Ronch Valleys. Besides the usual common varieties such as peas, cauliflower, potatoes, etc., tomatoes, cucumbers, squash, vegetable marrow, corn, beans of several varieties, and citrons will grow in abundance. With the exception of tomatoes, which were ripened indoors, all of the other vegetables were matured independent of artificial means, and in most cases in land that had received little or no cultivation. I might also add that on four different claims in the vicinity of Chief Lake a number of tobacco-plants were set out, all of which grew splendidly, many of the leaves attaining a length of nearly 3 feet.

This will give some idea of the climatic conditions existing throughout the Fort George District.

I have, etc.,

Chas. E. Bailey,

Inspector of Pre-emptions.

REPORT OF THE INSPECTOR OF PRE-EMPTIONS, OSOYOOS, SIMILKAMEEN, AND KAMLOOPS DISTRICTS.

VERNON, January 13th, 1915.

H. Cathcart, Esq.,
Superintendent, Inspection Branch, Victoria, B.C.

SIR,—In the Osoyoos District there is a slow but steady increase in the clearing of land and acreage under cultivation. Such conditions are particularly noticeable in the vicinity of Lumby and about Trinity Valley. Families are being supported from the returns of pre-emptions, as once this land is put under cultivation it yields enormous crops; on account of the large dead cedar-stumps and thick undergrowth of small scrub, however, this land requires a considerable amount of capital and labour to clear it. There are a few odd quarter-sections still available for pre-emption.

In the vicinity of Mable Lake and up the Shuswap River the pre-emptions are principally on logged-off timber lands, and the scattered timber left enables the settler to make sufficient money in winter, by putting this in the river for the logging companies, to enable them to remain on their places and clear land during the summer; therefore one sees a greater amount of acreage put under cultivation in this locality than in places not so fortunately situated. The land about Mable Lake is very productive, but most of it is very rough, with steep side-hills.

In going farther east into Township 57, a very fair amount of clearing has been more easily accomplished on account of the timber having been burned some years ago. The land is of a poorish quality, the surface soil also having been burned off. The bottom land along the creek is excellent, but clearing is heavy and expensive; consequently very little has been done. Along the Harris Creek Valley some extra clearing has been done this year; the land is a deep black soil, producing abundant crops of hay; some clearing is light, being alder and willow, but the fir bench land is very heavy.

Coming west into Townships 6 and 3, some good work has been done, as the settlers have the advantage of being able to sell the wood for fuel in Vernon, and in this way lessen the expense of clearing the land.

Following down the west side of Okanagan Lake, very little improvement has been done until one reaches Bear Creek, excepting by a few settlers at White Man's Creek who have cleared several acres and planted small orchards. A new road has been constructed about ten miles up Bear Creek, enabling the settlers to get their supplies in and their vegetables and other products out to market. Land-clearing is very expensive in this valley, being heavy fir and pine timber land; very little has been done this year.

In the vicinity of Westbank and Trepanier Creek development-work has not been undertaken this year.

In Meadow Valley and other small valleys to the west of Summerland a small amount of land has been cleared and put under cultivation, but most of the pre-emptors have been engaged in hauling logs to the box-factory located in Meadow Valley.

In Township 27 and vicinity of Mission Creek many improvements have been made on several pre-emptions, and although the elevation is rather high, good crops of potatoes and other vegetables as well as grain are being raised.

SIMILKAMEEN DISTRICT.

In Maron Valley and near White Lake and Yellow Lake some pre-emptions have been taken up for range purposes and have very little cultivable land; there are others being cultivated and good crops produced. These pre-emptions run about 20 per cent. of good land, the balance being range land.

In the vicinity of Keremeos there are a few scattered pre-emptions, some of which are along the river-bottom, and a few acres have been cleared and put under cultivation this year. The clearing is principally alder and cottonwood, a stretch of good land extending for some miles up the Ashnola River; and while all the land joining the river has been pre-empted, there is still some on the high benches available for settlement. Very little clearing or development-work has been done on any of this land, as there is no road and in most places a very poor trail; the clearing in some places will be heavy, as the timber is very thick, though small.

On the benches to the west of Hedley there are some good pre-emptions and considerable land-clearing has been done this year; there is plenty of moisture on these high bench lands and good crops of hay and grain can be grown.

On Darcy Mountain near Princeton the land is good and very productive, but the clearing is heavy, and there being no sale for any quantity of wood it is a difficult task to make any headway where the settlers have to burn the timber on the ground.

Going thence into the Kettle Valley, in the vicinity of Fife development-work has progressed favourably; most of the inhabitants here are Italians and make good settlers. The clearing is heavy, timber small, but very thick. On the North Fork of Kettle River some progress has been made, but in most places the clearing is hard; most of the land has been logged off; the stumps are large and the undergrowth is thick.

More progress has been made on the high bench lands near Grand Forks than any other part of the Similkameen. Some nice homes have been carved out, with excellent improvements. The settlers get sale for their wood in Grand Forks and the clearing is not very heavy; the soil is deep sandy loam with plenty of moisture, and produces grand crops of vegetables and grain.

In the vicinity of Rock Creek, Bridesville, and Anarchist Mountain very little work has been done this year. Nowhere will better returns for labour be received than on Anarchist Mountain; the soil is a deep rich loam and produces heavy crops of grain; 54 bushels per acre was the returns on one place this year. There are some very good quarter-sections available for pre-emption in this locality.

Kamloops District.

Up the Clearwater River is an entirely new section of the country, only surveyed last year. As yet it has not been opened up by roads nor trails (excepting for the first ten miles); nevertheless quite a number of pre-emption records were taken out in the past year, though owing to the "call to arms" very little development-work has been done. This section, like most of the North Thompson country, is broken and rugged, with sections of exceptionally good land and easy to clear, this running into rugged cliffs and thence into open meadow lands and swampy flats. About Myrtle River the land is similar to that of Clearwater, and will take a considerable time to get roads and trails cut through to open up the country and so make travelling in and out not a difficult task.

In the neighbourhood of Black Pool and Mount Olie a fair amount of improvement in the way of land-clearing has been accomplished. In the low bottom lands the growth is heavy cottonwood and birch, while on the benches, which have been mostly burned over, small dead fir and tamarack are encountered.

About Chinook Cove a greater amount of development-work has been done, especially in clearing and building, this past year than usual, and considerable extra acreage is ready for crop next year. The improvements to the roads and the new bridge over the Thompson River have been a great help to the settlers.

On the Barriere River and Lakes development has not gone on as usual, as most of the men from this section are in military service.

I have, etc.,

R. Gillespie,

Inspector of Pre-emptions.

REPORT OF THE INSPECTOR OF PRE-EMPTIONS, KOOTENAY AND LILLOOET DISTRICTS.

Fernie, B.C., December 13th, 1915.

H. Cathcart, Esq.,

Superintendent, Inspection Branch, Victoria, B.C.

Sir,—I have the honour to submit my report as Inspector of Pre-emptions in the Kootenay Lands District.

During 1915 my inspection-work has extended over East and West Kootenay and a part of Lillooet District.

In the Fernie District, on the west side of the Kootenay River, in the vicinity of Dorr, quite a number of pre-emptions have been taken out. The land is rolling and sandy and very productive where water can be got for irrigation. On Elk River, north of Michel, the settlers are all doing well and have had excellent crops this year.

In the Cranbrook District, between Cranbrook and Kimberley, the land thrown open has been nearly all taken up, mostly in 40-acre tracts. The land is of a light sandy nature and a lack of water makes it very difficult to make a living off the land. The same condition arises on the Kootenay River, east of Waldo, although here the soil is of a better quality. On account of the gravel subsoil, I do not think dry-farming would prove successful.

In the Nelson District the land taken up on the Slocan River is a rich sandy loam. The clearing is slow, but in time will give a good account of itself. There is quite a block of land on the Little Slocan which when thrown open will make excellent agricultural land. There are a number of places taken up east of Burton, on Cariboo Creek. The land is rough and very high and not suitable for agriculture.

Most of the land along the Arrow Lakes is good, but in small quantities and scattered. In the Revelstoke District the best land has been taken up and very few pre-emptions taken out this year.

The Slocan District is mostly taken up. The pre-emptors are all doing good work.

In the Golden District the settlers, mostly living on their places, are making slow progress clearing. A road has now been completed from the Windermere Valley to the Kootenay, affording facilities for getting in and out which is a great benefit. The land is high and will be suitable for hay rather than for grain. The settlers along the west side of the Columbia River are doing some good work. Now that a road has been completed from Wilmer north, conditions are much improved.

I made 272 inspections in the Lillooet District and found less than half of the pre-emptors improving their land, or even living on it. The country east of the Cariboo Road, in the Bonaparte country, is of a rolling nature interspersed with numerous small natural meadows which produce a good quality of hay for winter consumption. The vegetation is good all through here and would make a fine dairy country. Along the Chilcotin River the banks are very high and rough, and the benches farther back are rocky and dry. This is a grazing country, and although cattle-raising is the chief industry, I fancy it would make an ideal sheep-range. The land is of a sandy nature. Fruit and vegetables do well along the river bottoms of the Chilcotin and Fraser Rivers.

The majority of the settlers in the Lillooet District seem to have a very poor idea of their duties as pre-emptors.

I have, etc.,
W. A. WILMOT,
Inspector of Pre-emptions.

REPORT OF THE INSPECTOR OF PRE-EMPTIONS, SKEENA DISTRICT.

PRINCE RUPERT, December 31st, 1915.

H. Cathcart, Esq.,
Superintendent, Inspection Branch, Victoria, B.C.

SIR,—I have the honour to report herewith the work of inspection carried on in the Skeena Land District during the year.

KITIMAT VALLEY AND KUMEOLON INLET.

These districts were visited about June 15th. The conditions prevailing there are about the same as in 1914. A few of the pre-emptors have increased the areas of clearing and cultivation. A small number of new records have been issued for the district. Lack of connection with the outside is staying development for a time. As soon as this is obtained a marked change will be noticed. Kumeolon Inlet, located to the north of the entrance of Kitimat Arm, is as yet a very new territory, there being only a few settlers. Two of the permanent ones have made good showings.

KITSUMGALLUM VALLEY.

Starting April, in the neighbourhood of twenty-two pre-emptions were inspected. A considerable amount of work has been done since the fall of 1914. In the upper portion of the valley beyond Kitsumgallum Lake over thirty people wintered. The season was very mild.

The lowest the thermometer showed on the shores of the lake was 2 below zero, and back on the flats a few miles 6 below, with an average of barely 2 feet of snow. This spring the settlers have been slashing and burning. Many have set out varieties of fruit-trees, the excellent showing made in the lower part of the valley, closer to the railroad, inclining them to the belief that apples, cherries, etc., will do well. The timber on the flats is not very large. On the river-bottoms it is heavier, but the soil is richer. In several instances the pre-emptors have cleared a sufficient amount in the timber to make a garden, and then transferred their labours to the benches, where they expect to raise hay and grain for feed. Once good communication is established with the railroad this portion of the district ought to forge ahead.

Lakelse.

About July 17th a tour of this valley, tributary to the Skeena Valley, was made. The road to Lakelse leads from Terrace, on the Grand Trunk Pacific Railroad, ninety-three miles from Prince Rupert. It is one of the oldest-settled areas of the district. The land is mostly taken up, although there are quarter-sections and fractions here and there yet vacant. Much has been written in the past of the richness and fertility of the soil, and all that has been said has been borne out by the splendid showing made at the Prince Rupert Agricultural Exhibition of 1914, the roots and fruits exhibited being of first-class quality and size, and the yield per acre most satisfactory.

Nass Valley.

During the month of August Nass Valley was visited and inspection made. It is as yet somewhat remote from railroad and steamboat lines, but this condition is borne in mind by the settlers themselves. The roads and trails throughout the valley enable all to reach their holdings with vehicle or horse, only those on the extreme limits having to do any packing. Considering the present depression, a fair amount of progress has been made by the pre-emptors. Satisfactory experiments have been made in raising varieties of grain and alfalfa. During the summer daylight covers a large percentage of the twenty-four hours, tending to rapid growth and maturity. Along the upper part of the valley there are considerable areas of open land where cattle will find plenty of grass and peavine, and on the slopes grazing may be found till late in the fall.

Queen Charlotte Islands.

Only the northern part of Graham Island was inspected during the season of 1915, covering places adjacent to Masset, Oeanda River, Port Clements, and Sewell. In the neighbourhood of fifty reports were made. This section of the Skeena District has been and still is suffering from handicap in the lack of connection and communication with the Mainland. For a time last summer service was almost discontinued, and then a fortnightly boat service was established. The passage of time and an increase of population and output will bring about the remedy. The soil is very productive and the climate very mild, being conducive to the growing of roots, vegetables, and berries, and there seems to be no reason why, in the near future, hogs, goats, sheep, and chickens should not play an important part in the revenue-getting industries of the island. As has been previously stated, cattle do remarkably well, winter feeding being an almost negligible factor. A considerable amount of draining is necessary in order to bring into use and cultivation a large amount of open country. At present in the sloughs at the entrance of creeks and in the swamps, partially covered with water during the rainy season, grass grows luxuriantly. During the past season strawberries were sent from the southern end of the island the equal in quality and size of any from other sections of the entire district. At the Prince Rupert Agricultural Exhibition this year first prize was awarded to the east coast associations of the island for the excellence of their showings in the products of agriculture.

Banks Island.

On April 12th an inspection trip was made to Banks Island, taking in on the way Gilbert Island, Spicer Island, in the Beaver Passage, and the north-west portion of McCauley Island, where two pre-emptions had been recorded. Owing to stormy weather it was afternoon of the third day before a landing was made on Banks Island. There are now in the neighbourhood of seventy-five pre-emptions recorded on Banks Island, of which a very small percentage are

not in good standing. The majority of the pre-emptors are Swedes and Norwegians. Early this spring a small colony of Italians established in the neighbourhood of the outlet of Deadman's Creek, at the north end of the island. These foreign-born people make first-class settlers. They are good workers, thrifty, and, as a rule, bring with them a knowledge of agriculture. Most of them take up land with the idea of making homes for themselves and their children. They are not deterred by the difficulties that always beset the pioneer, accepting obstacles as a matter of course, to be overcome by hard work, time, and patience. Considering the present means of communication with the Mainland, the same being by privately owned gasolene-launches, a very considerable amount of work has been accomplished. Horses and a few implements have been taken over on scows and ploughing started. As time goes on there is no doubt better service will be provided. These pioneers have the right idea; that of helping one another in the erection of dwellings and ditching, the last being the first and greatest essential to the cultivation of the soil and the future prosperity of the island. Last winter there was only a flurry of snow, and frost was barely in evidence. Cattle may run out all winter without risk and should be in fine condition in the spring. At present there is plenty of pasturage for a limited number of stock. There is not nearly the covering of moss as is popularly supposed. In some places it is from 4 to 8 inches deep, but in most instances much less. There are extensive areas where moss does not appear. The soil is a light sandy loam, and, as the country is mostly rolling, it should be no great task to drain a considerable amount of land by a system of co-operation in ditching.

PORCHER ISLAND.

During July the pre-emptions on Porcher Island were inspected. A marked improvement was noticed over last year. Some new settlers have taken up occupation, and the older ones have increased their clearings and are raising a greater amount of produce. Fowls do splendidly. The past season Porcher Island eggs commanded the highest price on the market, and the demand more than equalled the supply. There is plenty of room for development and expansion in this particular branch of farm-life, and when business methods are introduced there is no doubt as to the profit. The roots and other produce from the island court comparison with any from other sections of the district. It is the intention of some of the settlers to turn their attention to hog-raising. This should be a successful enterprise. Sheep-raising has been tried, but up to the present time has not proved a success. The cause of partial failure may be attributed to those who made the venture not being properly prepared to look after their stock. The climate and other conditions are in favour of this particular business.

WATERFRONT AND ISLANDS ADJACENT TO PRINCE RUPERT.

Now that other than British fishermen may buy bait and dispose of their catches at Prince Rupert, boats from Alaska and the United States will join the fleet from time to time. A great many independent fishermen, owning their own small craft and gear, follow the halibut and salmon fishing. There are numbers of islands in the vicinity of Prince Rupert where there is good harbourage and shelter for their boats and ideal spots for homes. It is almost a certainty that as soon as the fishing industry becomes permanently established a percentage of the men engaged will be imbued with the idea of taking up a piece of land in order to have a home for themselves and their families. When the fishing season is over, time may be profitably spent in clearing the ground and cultivating the soil. They have their own boats to carry out whatever necessaries are required, and, in time to come, to bring back to market the product of labour. Every inducement holds forth. The cost of living on a pre-emption, once the initial expense has been met, is very small compared with that of the city. Vegetables of all kinds may be raised, and chickens pay for themselves in a short time, and fish, fresh, salted, and smoked, are to be had for the catching and curing. House-rent, the cost of fuel and water is entirely abolished, and the expense attached to clothing is next to nothing. Add to this the fact that during the open season there is always the chance to get deer, ducks, geese, and grouse. Wild berries grow in abundance. Couple all these with an amount of diligence and intelligence in the cultivation of the soil, and we have, figuratively, "a land of plenty."

I have, etc.,

C. L. CULLIN,

Inspector of Pre-emptions.

REPORT ON DRY-FARMING INVESTIGATIONS IN LILLOOET AND NICOLA DISTRICTS.

By Professor W. J. Elliott.

December 21st, 1915.

Hon. William R. Ross, K.C.,
Minister of Lands, Victoria, B.C.

Sir,—I have the honour to submit herewith a report covering the experimental work undertaken on the Dry Farm at 105-Mile House on the Cariboo Trail, and at Quilchena, located on the Commonage south of Nicola, B.C. As will be remembered, the experiments were begun at your direction during June, 1913, the purpose being to determine the value of certain so called dry areas of British Columbia for agricultural and settlement purposes. The report covers the period from September 1st, 1914, to August 31st, 1915, and includes a full record of the crops grown during the summer of 1915.

While the present report deals particularly with the record of the crops grown during the past summer, yet we may frequently refer to the 1914 results that appeared in your report for the Department of Lands for last year, so that we may have a comparison of results. For it must be borne in mind that it is only an average over a series of years that gives accuracy to records of this kind.

This report, like last year's, includes the records of rainfall and snowfall, temperature records, and, in addition, actual records obtained by the growing of a variety of crops under various conditions. Some of the results of last year suggested that we might with profit undertake a "date of seeding" experiment with certain grains, and also a "rate of seeding" experiment. These were tried out this year on both farms, and the results will be found properly tabulated below.

105-MILE FARM REPORT.

Preparation of Soil at 105-Mile House.

The land for the 1915 crop was broken during the spring and early summer of 1914, and as it was all native sod the results recorded below are those of the first crop grown upon the land. The ploughing had been done very thoroughly, and the frequent cultivations that were given during the summer prepared a very excellent seed-bed. The last thing in the fall all of the slopes were ridged with the disk by facing each pair of disk-blades toward each other. This was done crosswise of the slopes, the purpose being to catch as much as possible of the melting snow in the spring. The plan was very successful, as the foremen report that very seldom, if ever, did the snow-water in the depressions break through the small ridges left by the disk to run off the land and be lost for the crop.

Character of Spring at 105-Mile House.

The spring of 1915, like the spring of 1914, opened up with a considerable amount of cold, backward weather. There was also much more wind than in 1914, and it was feared that this wind might make a heavy draught upon the stored-up moisture on our cultivated fields, but the results that are herewith given are splendid evidence of the fact that the cultivation had been thoroughly accomplished.

In comparing April, 1915, with April, 1914, we find that the former was, on the average, slightly cooler than the latter. The average maximum and minimum temperatures respectively for 1914 were 50.5 and 31.8 degrees, while the corresponding averages for 1915 were 48.7 and 29.6 degrees. For the same month the highest and lowest temperatures recorded during 1914 were 66 and 22 degrees respectively, while the corresponding highest and lowest for 1915 were 58 and 24 degrees. The above figures are mentioned particularly because April is the principal seeding month for both wheat and oats. The lower temperatures for 1915 as compared with 1914 seem to have no evil effect upon the proper germination and sprouting of the grain, and upon the final very excellent results that were obtained with practically all crops grown.

PRECIPITATION AT 105-MILE HOUSE.

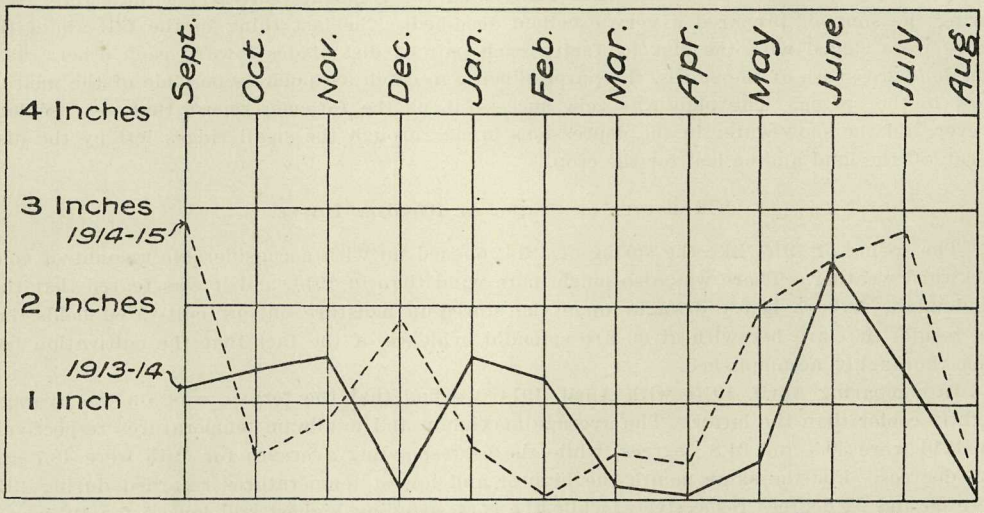
The general impression is that the precipitation for 1915 was greatly in excess of that of 1914, and while there is more precipitation recorded at the 105-Mile Station for 1915 than for 1914, the excess is not nearly as large as is imagined. The following table gives the precipitation at 105-Mile House by months, from September 1st, 1913, to August 31st, 1914, as compared with that from September 1st, 1914, to August 31st, 1915:—

Table 1.—Precipitation by Months.

Month.	Precipitation from Sept. 1st, 1913, to Aug. 31st, 1914.	Precipitation from Sept. 1st, 1914, to Aug. 31st, 1915.	Month.	Precipitation from Sept. 1st, 1913, to Aug. 31st, 1914.	Precipitation from Sept. 1st, 1914, to Aug. 31st, 1915.
	Inches.	Inches.		Inches.	Inches.
September	1.08	2.92	April	...	0.3
October	1.34	0.39	May	0.35	2.07
November	1.37	0.9	June	2.64	2.6
December	...	1.9	July	1.32	2.83
January	1.41	0.5	August	...	0.2
February	1.23	...			
March	0.2	0.44	Totals	10.94	15.05

It will thus be seen that the precipitation for 1914-15 is not nearly as large as popular opinion would suggest. As a matter of fact, it is only 4.11 inches greater than for the corresponding months of 1913-14, and in any event 15.05 inches (the total for twelve months) is regarded as a comparatively light rainfall. There are one or two significant facts about the rainfall as given above, and to bring this out more clearly it will be better to put these figures in the form of a chart or diagram. In this way the various points may be seen much more clearly. In the following chart the precipitation by months will be given. The figures representing September 1st, 1913, to August 31st, 1914, will appear as a straight line, while those representing September 1st, 1914, to August 31st, 1915, will appear as a dotted line.

Chart 1.—Showing Monthly Precipitation from September 1st, 1913, to August 31st, 1914, as compared with that from September 1st, 1914, to August 31st, 1915.



The two records as they appear in the above diagram are alike, generally speaking, in the fact that the precipitation is light from the end of September to the end of May. During the winter of 1913-14 most of the snow came in January and the early part of February, while in 1914-15 the majority of the snow came in December. This variation is no more than that which occurs in any part of the Western Provinces.

During March, and particularly during April and the fore part of May, rainfall is comparatively light, which is an advantageous thing, as April and the fore part of May are the seeding months. A light precipitation is desirable, as there would, therefore, be little to interfere with the cultivation, etc., necessary for an early seeding. But the most significant fact is noted in the high precipitation during the months of May, June, and July, or the months that are the growing and filling months for the grain. It will be noted that during 1915 May, June, and July have each over 2 inches of precipitation. This is more than was received during the corresponding months of 1914. However, it will be seen that in both years good rains fell in May, June, and July, or just when the crops needed them most for proper filling and maturing.

AVERAGE TEMPERATURE BY MONTHS AT 105-MILE HOUSE.

In this table a comparison is also given between the average temperatures from September 21st, 1913, to August 31st, 1914, and those from September 1st, 1914, to August 31st, 1915.

Table 2.—Average Temperatures for Corresponding Months during 1913-14 and 1914-15.

Month of Year.	Average Daily Maximum.		Average Daily Minimum.		Average Daily Maximum.		Average Daily Minimum.	
	1913-14.	1914-15.	1913-14.	1914-15.	1913-14.	1914-15.	1913-14.	1914.15.
	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.
September	65.1	57.5	39.3	38.7	78.0	74.0	44.0	31.0
October	52.2	51.7	26.2	32.5	64.0	66.0	16.0	22.0
November	39.3	36.9	21.4	23.5	49.0	53.0	4.0	3.0
December	35.0	21.4	26.5	10.6	46.0	33.0	8.0	—9.0
January	27.1	26.9	16.1	9.6	39.0	37.0	—13.0	—9.0
February	31.9	35.4	27.8	18.3	43.0	45.0	3.0	7.0
March	35.2	43.4	19.1	25.0	54.0	55.0	1.0	11.0
April	50.5	54.1	31.8	32.1	66.0	67.0	22.0	8.0
May	55.2	56.1	35.1	37.6	82.0	72.0	27.0	29.0
June	68.1	61.8	38.3	40.8	82.0	74.0	31.0	34.0
July	78.1	68.5	39.2	46.8	85.0	82.0	30.8	39.0
August	78.4	76.4	37.3	48.9	84.0	85.0	31.0	40.0
Average	51.42	49.17	29.84	30.37	64.3	61.9	17.0	18.7

From the above table it will be noted that the average daily maximum for 1913-14 is higher than that for 1914-15 by 2.25 degrees, while the average daily minimum for the corresponding period is in favour of 1914-15 by 0.53 degree. In other words, the average day temperature of 1913-14 was higher than the day temperature of 1914-15 by 2.25 degrees, while the average night temperature for 1914-15 was higher than that of 1913-14 by 0.53 degree. There is this general statement to be made regarding the temperature at 105-Mile House, and that is, it seems to be well adapted to the production of splendid crops, as both those of 1914 and those of 1915 have abundantly demonstrated.

CROPS GROWN AT 105-MILE HOUSE.

All of the seed used for experimental work at 105-Mile House was produced on the farm last year, and consequently is home-grown seed.

The general spring conditions were quite favourable for the seeding and germination of the grain, and it is interesting now to turn to the actual results from the various crops to see the splendid records obtained at 105-Mile House.

WHEAT.

The following chart gives particulars regarding the various wheat-crops grown with respect to date of seeding, rate of seeding, date cut, days to mature, yield per plot, and corresponding yield per acre:—

Table 3.—Giving Full Particulars regarding the Variety of Wheat Test.

Variety of Wheat.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Marquis	April 22	60	July 4	Aug. 24	124	¼	902	60 2
Huron	„ 17	60	„ 2	„ 18	123	¼	770	51 20
Durum	„ 22	48	„ 3	„ 26	126	¼	759	50 30
Red Fyfe	„ 17	60	„ 5	„ 26	131	¼	681	45 20
Galgalos	May 15	40	„ 14	Sept. 6	114	1-20th	103	34 20
Prelude	April 17	60	June 20	Aug. 12	117	¼	272	18 0

In all, six different varieties of wheat were tried, and produced from 60 bushels per acre in the case of Marquis to 18 bushels with the Prelude. It will be noted that, with the exception of Prelude, all the yields are very good, and in the case of the Durum, Huron, and Marquis varieties are quite exceptional. The yield of 60 bushels in the case of the Marquis wheat deserves special mention, as this yield compares favourably with the best of the wheat yields on the Prairie. In addition to this, the Marquis is regarded as one of the best milling wheats grown. Just why the Prelude should produce only 18 bushels per acre is somewhat hard to explain, because the same wheat on the Quilchena Farm produced the splendid yield of 37 bu. 52 lb. per acre. This variety will be tried again next year as it is a valuable milling wheat, and in addition has the distinction of taking fewer days to mature than most other varieties. Both points are important in desirable wheat for the 105-Mile District. In the case of Galgalos, we have another good milling wheat, and, as will be noted from the table above, a wheat that matures in the shortest time of any of those tried. In fact, the Prelude is supposed to be our earliest Canadian wheat, but, as will be seen, the Galgalos matured in even less time than did the Prelude. The Galgalos wheat was imported by the writer from Northern Montana, where on the State Experimental Farm it has given very favourable results for the past two years. The success of the Marquis, Red Fyfe, Galgalos, and Huron varieties augurs well for the 105-Mile District as a successful wheat-producing area.

"DATE OF SEEDING" EXPERIMENT.

Some of the yields recorded last year suggested the necessity of trying some experiments to determine, if possible, the proper date for the seeding of wheat, oats, and barley. A table follows covering a "date of seeding" experiment for wheat. For this experiment the Ghirka wheat was used. It may be remembered that the Ghirka wheat produced our largest yield last year—viz., 32⅔ bushels. This wheat was secured two years ago from the Montana Agricultural Experimental Station and had given good results in the dry belt of Northern Montana. That it is adapted to the conditions at 105-Mile House is evidenced by the splendid yields recorded below.

Table 4.—Date of Seeding with Ghirka Wheat.

Date seeded.	Rate of seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
	Bu.				Acre.	Lb.	Bu. lb.
April 10	1	June 30	Aug. 24	136	¼	420	28 0
„ 17	1	July 1	„ 24	129	¼	437	29 8
„ 24	1	„ 3	„ 24	122	¼	730	48 40
May 1	1	„ 8	„ 25	116	¼	722	48 8

The first plot was seeded April 10th and the other plots were seeded at one-week intervals until four plots were seeded. All plots were seeded at the rate of 1 bushel per acre. The yields of the first three plots are in the order of the date of seeding, with a very decided advantage in

favour of the April 17th seeding. The result from the May 1st seeding produced almost as much in yield as the April 24th seeding. It would appear from the above that a seeding date prior to April 17th is not at all suitable to conditions at 105-Mile House. By glancing at the "days to mature" column it may be noted that they are just the opposite of the "date of seeding." In fact, there is an astonishing regularity in the drop of seven days in the time required to mature any one plot as compared with the time to mature the plot that was seeded one week previously. So that we might infer from the above results that, in so far as 1915 is concerned, some date between April 20th and May 1st would be about the best time to seed wheat.

Rate of Seed per Acre.

This experiment was also tried with Ghirka wheat. All four plots were seeded on April 15th, and all took the same number of days to mature.

Table 5.—Rate of Seed per Acre with Ghirka Wheat.

Date seeded.	Rate of Seed per Plot.	Rate of seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
	Lb.	Bu.				Acre.	Lb.	Bu. lb.
April 15	7½	½	July 2	Aug. 25	132	¼	717	47 40
„ 15	11¼	¾	„ 3	„ 25	132	¼	745	49 40
„ 15	15	1	„ 2	„ 25	132	¼	765	51 0
„ 15	17	1¼	„ 2	„ 25	132	¼	761	50 40

The four plots were seeded as follows: ½, ¾, 1, and 1¼ bushels per acre; and while there is not as great a difference in the yields as might be expected, yet these arrange themselves almost in the order of the rate of seeding. All yields are exceptionally good for dry-land results, and what little advantage there is seems to be in favour of a seeding at the rate of 1 bushel per acre. Experiments such as these, however, are valuable just in proportion to the number of years that are represented in the results.

Variety Test with Oats.

In this experiment three varieties of oats that gave good results last year were tried. The following table will give the results of the experiment:—

Table 6.—Experiments with Three Varieties of Oats on ¼-acre Plots.

Variety of Oat.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
O.A.C. No. 72 ..	April 28	68	July 8	Aug. 17	111	¼	815	96 0
American Banner	„ 28	52	„ 10	„ 18	112	¼	748	88 0
Abundance	„ 28	60	„ 8	„ 23	117	¼	741	87 6

The yields this year are larger than those of last year. In fact, the three yields recorded above would stand as exceptional yields under any condition.

Larger Experiment with Oats.

The three varieties of oats mentioned in the above table, together with a Sixty-day oat, were tried on a larger scale. In this experiment the Abundance, O.A.C. 72, and Sixty-day oats were each seeded on a 3-acre plot, while 5 acres were used for the seeding of the Banner oat. As might be expected, the yields are not as large as those produced on the smaller areas, yet the results are very good indeed.

Table 7.—Experiment with Larger Areas of Oats.

Variety of Oat.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Bu.				Acre.	Bu.	Bu. lb.
Banner	April 30	1½	July 13	Aug. 23	115	5	310	62 0
Sixty-day	May 4	1½	" 1	" 8	96	3	174	58 0
O.A.C. No. 72 ..	" 5	1½	" 8	" 22	109	3	153	51 0
Abundance	" 7	1½	" 12	" 22	107	3	139½	46 17

It will be noted that all four varieties were seeded at the same rate per acre, and, in addition to this, were seeded from two to nine days later in the spring than were the plots recorded in Table No. 6 above. We think, perhaps, that the later seeding may account somewhat for the smaller yields obtained, but we will have something to say on this point later when the results of our "date of seeding" experiments are recorded. The above table also shows that the same varieties grown on a larger plot mature in from two to ten days less time. Special attention is called to the Sixty-day oat recorded in the above table. This oat was also imported by the writer from the dry areas of Montana two years ago. It produced 38 bushels per acre in 1914 and 58 bushels during the past summer. While the above yields are perhaps not large, yet for a dry-land area and for larger plots they are indeed good yields.

"DATE OF SEEDING" EXPERIMENT.

For the experiment regarding the "date of seeding" of oats the New Market variety was selected. This variety was grown last year on a 17-acre field and produced 39 bushels per acre. Each plot was seeded at the rate of 1½ bushels per acre. The first plot was seeded on April 15th, and another plot seeded one week later, and this was continued until all five plots were sown. As will be noted from the following table, the dates of seeding were as follows: April 15th, 22nd, 29th, May 6th and 13th.

Table 8.—"Date of Seeding" Experiment with New Market Oats.

Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
	Bu.				Acre.	Lb.	Bu. lb.
April 15	1½	July 1	Aug. 18	125	¼	800	94 4
" 22	1½	" 4	" 18	118	¼	900	105 30
" 29	1½	" 10	" 26	119	¼	818	96 8
May 6	1½	" 17	" 31	117	¼	729	85 26
" 13	1½	" 20	" 31	110	¼	706	83 2

It will be noted that the plots seeded on April 22nd matured in seven days less time than did the one which had been seeded one week earlier. The plots seeded April 22nd, 29th, and May 6th all took practically the same time to mature, while that which was seeded on May 13th actually matured seven days earlier than that which was seeded one week earlier, but the yield for the last-sown plot is the smallest of all. In the yields per acre, which is really the important consideration, the plot seeded April 22nd gave the best returns in the enormous yield of 105 bu. 30 lb. per acre. The yields from the plots seeded April 29th, May 6th, and May 13th are in the exact order of the date of seeding, producing 96 bu. 8 lb., 85 bu. 26 lb., and 83 bu. 2 lb. respectively. So that from the above experiment and for the year 1915 April 22nd seems to be about the best date for the seeding of oats.

"RATE OF SEEDING" EXPERIMENT WITH OATS.

It was also thought advisable to try a "rate of seeding" experiment with oats. The New Market variety was used in this test and the results were as follows:—

Table 9.—"Rate of Seeding" Experiment with Oats.

Date seeded.	Rate of Seed per Plot.	Rate of seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
	Lb.	Bu.				Acre.	Lb.	Bu. lb.
April 24	10½	1¼	July 1	Aug. 19	117	¼	460	53 0
„ 24	12½	1½	„ 1	„ 19	117	¼	416	49 0
„ 24	15	1¾	„ 1	„ 19	117	¼	816	96 0
„ 24	17	2	June 29	„ 21	119	¼	725	81 10
„ 24	19	2¼	„ 29	„ 21	119	¼	651	76 17

In the above experiment the five plots were all seeded on the same day at the rate of 1¼, 1½, 1¾, 2 and 2¼ bushels per acre. It will be noted that 1¾ bushels per acre seems to give the best results, and while the 2- and 2¼-bushel rates of seeding give first-class returns, yet they do not compare with the 1¾-bushel seeding. The 1¼- and 1½-bushel rates seem to be entirely too light to suit conditions at 105-Mile House. This experiment shows clearly the necessity for a knowledge of the most suitable rate to seed per acre, because in the one case we may seed so light that we do not make full use of the stored-up moisture in the soil, and in the other case we seed too heavy for the stored-up moisture, and not only waste seed in the seeding, but actually cut down the final yield per acre.

BARLEY RESULTS.

Only three different varieties of barley were tried—the Smyrna, White Hull-less, and Mensury. Two of these were seeded on May 17th and the White Hull-less on May 21st. There was no particular motive in testing these barleys out in a comparative way, because they are very different in many respects. For instance, the White Hull-less is, as its name implies, a barley that hulls out just like wheat at threshing-time. The Mensury is a six-rowed variety. Both the Mensury and White Hull-less were tried last year and only gave us fair results.

Table 10.—Yields from Three Varieties of Barley.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Bu.				Acre.	Lb.	Bu. lb.
Smyrna	May 17	1	July 8	Aug. 18	93	1-10th	285	59 18
White Hull-less	„ 21	1¼	„ 18	„ 26	97	¼	648	54 0
Mensury	„ 17	1½	„ 12	„ 20	95	¼	607	50 28

The Smyrna barley, which appears at the head of the list, is a new variety received from Professor Atkinson, who is in charge of dry-land investigational work in the State of Montana. A small 5-lb. package of this sample was received, and the results are estimated from the actual yield from a $^1/_{10}$-acre plot. This barley has given splendid results in Montana, and apparently will suit the dry areas of British Columbia. It grew rapidly and, as will be noted, matured in less time than either of the other varieties. Mention is made particularly of the White Hull-less variety that produced 54 bushels per acre. This barley only produced 9 bu. 28 lb. last year, and it is remarkable that the yield should be so very large for the past summer. It will be well to introduce a "date of seeding" and "rate of seeding" test for this variety, as its success means much in the way of stock-feeding for settlers who may come into the district. This year's results promise well for White Hull-less barley.

DATE OF SEEDING WITH TWO-ROWED CHEVALIER BARLEY.

The Two-rowed Chevalier barley produced the best results last year, and all the seed produced was saved for a "date of seeding" experiment in 1915. During the past summer

this variety has again produced more largely than any other variety. In fact, it leads any other variety by 7 bu. 18 lb.

Table 11.—Result of "Date of Seeding" Experiment with Two-rowed Chevalier Barley.

Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
	Bu.				Acre.	Lb.	Bu. lb.
May 7	1¼	July 8	Aug. 25	110	¼	801	66 36
„ 14	1¼	„ 10	„ 27	105	¼	692	58 0
„ 21	1¼	„ 16	Sept. 4	106	¼	650	54 0
„ 28	1¼	„ 19	„ 4	99	¼	603	50 0

It will be noted that the yields per acre are in the exact order of the date of seeding per acre. There is a difference of eleven days in the time required to mature the 66-bu. 36-lb. crop and that required to mature the 50-bushel crop, but the longer time required to mature the former plot produced 16¾ bushels more per acre than in the latter case. It is apparent that in this experiment, and also in the "date of seeding" experiment with oats, the plots that were seeded late in the spring and which, therefore, matured in a comparatively short time have produced lower yields than those that were seeded earlier, and consequently required more days to mature. One of the chief reasons for this is no doubt the fact that crops that are started as early as possible in the spring have ample moisture for growth and are well grown by the time the warm weather comes on. By this time the crop itself has grown to such an extent that it shades the ground and thereby prevents evaporation. It thus saves for the final maturing of the crop the soil-moisture which might otherwise be lost by evaporation.

EXPERIMENT WITH FIELD-PEAS.

Two varieties were tried—the Canadian Beauty and the Prussian Blue. The seed was home-grown, and the plots produced as follows:—

Table 12.—Test with Two Varieties of Field-peas.

Variety.	Date seeded.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
				Acre.	Lb.	Bu. lb.
Canadian Beauty	May 21	Sept. 15	117	¼	159	10 36
Prussian Blue	„ 21	„ 20	122	¼	114	7 30

Both varieties were seeded on the same day, but it required five days more time to mature the Prussian Blue than was necessary in the case of the Canadian Beauty. The yields are not by any means large, but the quality of the grain is excellent.

FLAX.

The Premost flax was the only variety tried. The seed was received from the Quilchena Station, where it had done fairly well. It may also be remembered with interest that the plague of grasshoppers which visited the Quilchena Station in 1914 scarcely injured this variety of flax at all. The Premost flax was seeded on May 21st, was cut September 4th, thus requiring 106 days to mature. It produced 115 lb. on a ¼-acre plot, or at the rate of 7⅔ bushels per acre. This is not a large yield, and yet the flax is of sufficient value to warrant it being tried under various conditions another year.

SHEEP-PASTURE EXPERIMENT.

Numerous plots were seeded on both the Quilchena and 105-Mile Farms to various kinds of grasses and legumes. On the Quilchena Farm the crops were cut for hay. The results will appear at the proper time under the Quilchena report. At 105-Mile House the plots of grasses and legumes were used as pasture for sheep. There were eight sheep in the flock, which averaged 132.2 lb. each, or a total of 1,058 lb. The pasturing on the various plots was as follows: May 14th to 29th, on ¼ acre of brome-grass; May 29th to June 20th, on ¼ acre white clover and ¼ acre common red clover; June 20th to July 20th, on ¼ acre of alsike and ¼ acre mammoth red clover; July 20th to August 1st, on ¼ acre alfalfa; August 1st to 12th, on ¼ acre brome-grass and ¼ acre rape.

As the sheep were moved back on to the brome pasture for the second time on August 1st the total area represented in the pasture experiment amounts to 1¾ acres. The beginning weight of the sheep was 1,058 lb. and the finishing weight, 1,430 lb., thus representing a production of 373 lb. of mutton on 1¾ acres. At the exceedingly moderate estimate of $7.75 per hundred, the 373 lb. represents a value of $28.90 for 1¾ acres, or $16.51 per acre. These figures are slightly under those of last year for the sheep-pasture experiment, but the character of the sheep will easily account for the difference. The 1915 sheep were not by any means as good a class of feeders as were those secured during 1914. However, they were the only sheep that we could get, and consequently we had to do what we could with what was available. This pasture experiment will be continued.

TIMOTHY CROP.

During the early summer of 1914 some land was broken on a lower portion of the farm and within a short distance of Watson Lake. This ground was given special care in the way of cultivation, and by August the sod seemed to be well decomposed and a very excellent tilth was secured. Timothy was seeded on this land at the rate of 6 lb. per acre. It may be remembered that the latter part of the summer of 1914 was quite dry, and though the timothy-seed sprouted, yet the growth that it made during the fall was quite disappointing. It did not seem to stool out and thus produce a fair growth the first season. However, it came through the winter well and was harrowed early in the spring to loosen the soil surface and hold the moisture. It grew well and at haying-time produced a rather remarkable crop of timothy-hay. In all, there were some 12 acres seeded to timothy, and the measured stack showed a crop of 16 tons, or at the rate of 1⅓ tons per acre. This is an excellent showing on dry land with only 15.05 inches of rainfall. It will be of much interest to see how the crop will produce during next season.

VEGETABLES.

There is perhaps nothing new to report regarding the success of the vegetables tried at 105-Mile House. Practically every vegetable that was grown produced splendid returns. In fact, the vegetable-garden at 105-Mile House looked just like any other well-kept and productive garden that one might find. The vegetables that did well include all the staples, such as turnips, beets, peas, rhubarb, parsnips, radish, lettuce, cabbage, cauliflower, carrot, etc.

POTATOES GROWN AT 105-MILE HOUSE.

Three varieties of potatoes were tested out on ⅛-acre plots, and one variety was grown on a $^1/_{12}$-acre plot. The results were as follows:—

Table 13.—Comparison of the Yields of Four Varieties of Potatoes.

Variety.	Date seeded.	Date above Ground.	Date lifted.	Days to mature.	Size of Plot,	Yield per Plot.	Yield per Acre.
					Acre.	Lb.	Bu.
Beauty of Hebron	May 26	June 20	Oct. 14	141	⅛	751	100.1
Duke of York	„ 27	„ 16	„ 14	140	⅛	696	92.8
Sharp's Victor	„ 26	„ 16	„ 13	140	⅛	630	73.8
Gold Mine	„ 27	„ 19	„ 13	139	1-12th	369	73.8

It should be mentioned that the yields here recorded are of marketable potatoes, as all small non-marketable potatoes were eliminated before the weights were taken. The yields are very fair and the quality of the potatoes for table use cannot be excelled. There is no doubt about the fact that excellent potatoes may be grown in the 105-Mile District on the dry-land areas, and that the growth of marketable yields as reported above will mean much to those who may eventually take up land in this district.

QUILCHENA REPORT.

PREPARATION OF THE SOIL AT QUILCHENA.

Generally speaking, the same method was followed at Quilchena as at 105-Mile House in the preparation of the land. Some 40 acres were broken during the summer of 1914. This newly broken land was thoroughly cultivated and ridged with the disk in a similar manner to that at 105-Mile House. In the spring of 1915 a stroke of the harrow reduced the ridges to the common level of the ground and our seed-bed was ready.

SPRING CONDITIONS AT QUILCHENA.

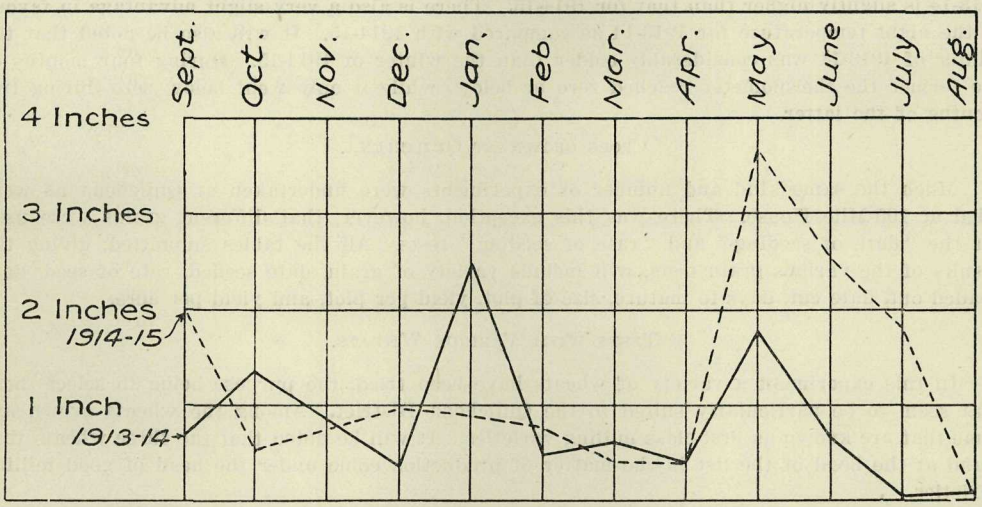
The precipitation records for Quilchena are very close to those for 105-Mile House. The figures from September 1st, 1914, to August 31st, 1915, for each farm are: Quilchena, 15.203 inches; 105-Mile House, 15.05 inches. We shall herewith submit a table showing a comparative monthly record of the precipitation at the Quilchena Station, covering the year September 1st, 1913, to August 31st, 1914, as compared with the year September 1st, 1914, to August 31st, 1915:—

Table 14.—Precipitation Table, covering Corresponding Months in 1913-14 and 1914-15.

Month.	Precipitation from Sept. 1st, 1913, to Aug. 31st, 1914.	Precipitation from Sept. 1st, 1914, to Aug. 31st, 1915.	Month.	Precipitation from Sept. 1st, 1913, to Aug. 31st, 1914.	Precipitation from Sept. 1st, 1914, to Aug. 31st, 1915.
	Inches.	Inches.		Inches.	Inches.
September	0.71	1.962	April	0.51	0.48
October	1.36	0.45	May	1.76	3.72
November	0.96	0.757	June	0.75	2.52
December	0.40	0.97	July	...	1.88
January	2.61	0.85	August	0.02	0.314
February	0.56	0.7			
March	0.7	0.59	Totals	10.34	15.203

Here again those who expected that the 1914-15 rain records would reveal a precipitation that was greatly in excess of that of 1913-14 were disappointed. As is the case at 105-Mile House, there is a larger rainfall, but not nearly as large as was anticipated. True, the records show that we had 4.863 inches more in 1914-15 than in 1913-14, yet it must be remembered that the rain recorded for Quilchena for 1913-14—viz., 10.34 inches—is an exceedingly small rainfall, and that a rainfall that is even as much as 15.203 inches is still regarded as a very limited precipitation. It is somewhat of a generally accepted fact in irrigation districts that where the precipitation falls below 20 inches it is then advisable to prepare for irrigation. This year, at Quilchena and 105-Mile House, when every one thought that we were getting such an abundance of rain that we might be classed as "wet areas," we are still approximately 5 inches below the mark where it is thought that irrigation is regarded as necessary. We shall submit the above table in the form of a diagram, so that the precipitation at the various times of the year may be more clearly seen. In the following diagram the 1913-14 precipitation will be indicated by a straight line, while that for 1914-15 will appear as a dotted line:—

Chart 2.—Showing Diagram of Precipitation, Records from September 1st, 1913, to August 31st, 1914, as compared with September 1st, 1914, to August 31st, 1915.



Generally speaking, the two precipitations represented in the above chart are much alike from September to April, with the one exception of the month of January. During January, 1914, the precipitation reaches 2.61 inches as compared with 0.85 inch in January, 1915. The general tendency of the two lines for May, June, July, and August is much the same, although the 1914-15 rainfall is considerably more than that of 1913-14. The 1914-15 chart confirms last year's (1913-14), in that there is much more rain in the summer months, when the grain needs it for filling, than at any other time of the year. This fact is very significant as far as the possibility of producing crops is concerned, because of the opportuneness of the rain. For it is a well-recognized fact that a district may do with a very much lighter rainfall if the rain that does come falls during the growing and filling months of the grain. This is a similar condition to that found at 105-Mile House, and augurs well for the success of both districts.

COMPARATIVE TEMPERATURE TABLE FOR QUILCHENA.

In the table below the average monthly maximum and minimum temperatures are given, as well as the average highest and lowest monthly temperatures. These are recorded for the two years, September 1st, 1913, to August 31st, 1914, and September 1st, 1914, to August 31st, 1915.

Table 15.—Average Temperatures for Corresponding Months during 1913-14 and 1914-15.

Month.	Average Daily Maximum.		Average Daily Minimum.		Highest Temperature during Month.		Lowest Temperature during Month.	
	1913-14.	1914-15.	1913-14.	1914-15	1913-14.	1914-15.	1913-14.	1914-15.
	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.
September	61.6	57.5	37.7	38.7	72.0	74.0	27.0	31.0
October	49.0	51.7	32.1	32.5	70.0	66.0	18.0	22.0
November	37.7	36.9	23.9	23.5	50.0	53.0	14.0	3.0
December	29.7	21.4	15.3	10.6	38.0	33.0	Zero	— 9.0
January	33.3	26.9	17.6	9.6	52.0	37.0	— 8.0	— 8.0
February	32.6	35.4	14.3	18.3	44.0	45.0	—26.0	7.0
March	41.2	43.4	22.2	25.0	53.0	55.0	—10.0	11.0
April	52.1	54.1	31.8	32.1	68.0	67.0	16.0	8.0
May	58.9	56.1	36.5	37.6	72.0	72.0	30.0	29.0
June	65.8	61.8	40.5	40.8	93.0	74.0	29.0	34.0
July	75.1	68.5	47.7	46.8	92.0	82.0	37.0	39.0
August	74.1	76.4	45.8	48.9	87.0	85.0	32.0	40.0
Average	50.8	49.1	30.4	30.35	65.9	61.9	13.4	17.2

A glance at the above will show that there is not a great deal of difference between the average temperatures for 1913-14 and 1914-15. However, the average day temperature for 1913-14 is slightly higher than that for 1914-15. There is also a very slight advantage in favour of the night temperature for 1913-14 as compared with 1914-15. It will also be noted that the winter of 1913-14 was considerably colder than the winter of 1914-15. During four months of the former the thermometer reached zero or below, while it only went below zero during two months of the latter.

CROPS GROWN AT QUILCHENA.

Much the same kind and number of experiments were undertaken at Quilchena as were tried at 105-Mile House. There was this exception, however, that different grains were used for the "date of seeding" and "rate of seeding" tests. All the tables submitted, giving the results of the various grain tests, will include variety of grain, date seeded, rate of seed, date headed out, date cut, days to mature, size of plot, yield per plot, and yield per acre.

TESTS WITH VARIOUS WHEATS.

In this experiment a variety of wheats have been tried, the purpose being to select those that seem to be particularly suited to the Quilchena District. Among the wheats grown are some that are known as first-class milling varieties. It will be noted that the three wheats that stand at the head of the list in the matter of production come under the head of good milling varieties.

Table 16.—Yields from Various Varieties of Wheat.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Ghirka	April 21	60	July 21	Sept. 6.	138	¼	724	48 16
Red Fyfe	„ 21	75	„ 26	„ 11	142	¼	721	48 4
Marquis	„ 21	60	„ 21	„ 2	134	½	1314	43 48
Huron	„ 21	60	„ 21	Aug. 25	126	¼	648	43 48
Durum	„ 21	45	„ 20	Sept. 10	142	¼	630	42 0
Prelude	„ 21	60	„ 8	Aug. 19	125	¼	568	37 52
Kubanka	„ 23	60	„ 19	Sept. 6	136	¼	553	36 52
Galgalos	May 12	48	Aug. 10	„ 15	126	1-16th	111	29 36

Of the varieties tried the Ghirka heads the list, as it did at 105-Mile House in 1914. Red Fyfe is second and Marquis third in point of yields. This is a first-class showing and speaks well for the adaptability of the Quilchena District for the production of desirable wheats, as all three are splendid milling varieties. Two other varieties that are regarded with favour as milling wheats are the Prelude and Galgalos. The Prelude occupies the same position this year as it does at 105-Mile House, which is only sixth place. It may be that this particular variety may need to become more acclimated to the district; thus we may obtain better results from our own home-grown seed. The Galgalos seed was secured in Northern Montana, but was received too late in the spring to give it a fair chance in the above test. It will be noted that it was seeded on May 12th, or twenty-one days after the seeding of the rest of the varieties. Another point that is worth while noting is the fact that it requires an average of 122.5 days to mature the Marquis, Huron, Durum, Red Fyfe, Galgalos, and Prelude at 105-Mile House, as compared with an average of 129.1 days for the same varieties at Quilchena. This is a surprising fact when it is remembered that the 105-Mile House Station is so much farther north than is the Quilchena Farm. Farther on in this report will be found a record covering the germination of all grains at Quilchena. It will be noted the very excellent vitality of all wheats listed.

"RATE OF SEEDING" TEST.

In this experiment the Red Fyfe variety of wheat was used. Four plots were each seeded on the same day, and the seed used was at the rate of ½, ¾, 1, and 1¼ bushels per acre.

Table 17.—"Rate of Seeding" Test with Red Fyfe Wheat.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Red Fyfe	April 21	30	July 26	Sept. 11	144	¼	709	47 16
"	" 21	45	" 26	" 11	144	¼	686	45 44
"	" 21	60	" 26	" 11	144	¼	706	47 4
"	" 21	72	" 26	" 11	144	¼	721	48 4

In the above table there is only a difference of 2 bu. 40 lb. between the highest and lowest yields. In addition to this, all plots matured in the same number of days. While the 1¼-bushel seeding seems to give the best results in this test, yet we do not feel justified in drawing anything in the nature of a definite conclusion from the above figures. The same experiment will be tried next year, and we shall hope for more conclusive results. There is this to be said, however, that all four results shown under this test are very good indeed, and would be creditable yields under conditions where moisture was abundant.

TEST WITH VARIOUS OATS.

The same purpose was in mind in testing out the varieties of oats as was the case in the testing of the wheat—viz., the determining of the varieties best adapted to the Quilchena District. In all, six varieties were tried, and the following gives in a tabulated form the results obtained:—

Table 18.—Test with Various Kinds of Oats.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Garton No. 22	April 23	76	July 27	Sept. 2	132	¼	780	91 26
Abundance ...	" 23	59½	" 21	Aug. 31	130	¼	775	91 6
O.A.C. No. 72	" 23	68	" 21	" 26	125	¼	763	88 26
Regenerated Abundance..	" 23	68	" 21	" 31	130	¼	684	80 16
Banner	" 23	51	" 29	" 31	130	¼	727	85 13
Sixty-day	" 23	51	" 12	" 14	113	¼	716	64 8

In the above table two varieties of oats produced 90 bushels or better per acre, three varieties produced 80 bushels or better per acre, and only one variety fell below the 80-bushel point—viz., the Sixty-day oat, with 64 bu. 8 lb. per acre. However, when the number of days required to mature this oat is considered, the reason for the comparatively light yield is seen at once. This is a very early ripening oat, and, as a matter of fact, ripened 16.4 days earlier than the average of all the rest of the varieties. All yields, however, are good. If the Sixty-day variety is eliminated, the other five are exceptional indeed. They would be considered as very considerably above the average produced under most favourable conditions. Even if the first five exceptional yields were eliminated, then the yield of 64 bu. 8 lb. would not be by any means regarded as a small yield. In fact, it would be a very creditable yield under ordinary circumstances.

"RATE OF SEEDING" TEST WITH OATS.

In this test the Garton No. 22 oat was used. All six plots were seeded on the same day and at the following rates: ¾, 1, 1¼, 1½, 1¾, and 2 bushels per acre. The Garton No. 22 oat tried in this experiment was a new variety introduced into this experimental work for the first time.

Table 19.—"Rate of Seeding" Test with Garton No. 22 Oat.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Garton 22	April 23	25½	July 27	Aug. 31	130	¼	707	83 6
"	" 23	34	" 27	" 31	130	¼	700	82 12
"	" 23	42½	" 27	" 31	130	¼	649	72 12
"	" 23	51	" 27	" 31	130	¼	644	75 26
"	" 23	59½	" 27	" 31	130	¼	771	90 24
"	" 23	68	" 27	Sept. 1	132	¼	780	91 26

The above six plots were all seeded on April 23rd, and the results would rather indicate that the heavier seeding has given the best results. It is a surprising fact, however, that the ¾- and 1-bushel seedings produced better results than the 1¼- and 1½-bushel seedings. This somewhat interferes with the theory of the heavier seeding producing uniformly better results. It is simply another case where an accurate statement can only be deducted after years of experimentation. An important point to be observed is the fact that all yields reported are very good indeed for dry-land conditions, and further substantiates the contention that these areas may ultimately be used profitably for farming purposes.

NINE-ACRE BULK CROP OF OATS.

To test the possibility of oat production in even a more convincing manner a 9-acre field was seeded to Garton No. 22. This field was seeded three days after the plots of the above table, and matured in 123 days, or in seven days less time than the average of the plots recorded under Table 18. The field produced a total of 727 bushels, or on an average 80 bu. 7 lb. per acre. This is certainly an enormous yield for a field of this size. The field was seeded at the rate of 1¾ bushels per acre.

TEST WITH VARIOUS BARLEYS.

In all, four different varieties of barley were tried. The same statement may be made with reference to the Quilchena test as was made regarding the 105-Mile House experiments, to the effect that the varieties of barley tested were so different in character that no particular thought was given to comparative yields from each. The experiment was simply to test different varieties.

Table 20.—Results of growing Various Barleys.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Smyrna	April 23	40	July 6	Aug. 19	113	⅛	510	87 24
Mensury	" 23	72	" 7	" 14	108	¼	1,015	84 20
Two-rowed Chevalier...	" 23	72	" 19	" 26	125	¼	887	76 44
White Hull-less	" 23	40	" 12	" 19	113	¼	844	70 16

The Smyrna barley, which produced the largest yield, was imported from Montana, and as only a 5-lb. package was received it was seeded at a very light rate per acre, to give it ample opportunity to stool. It was therefore grown on a ⅛-acre plot and produced at the rate of 87 bu. 24 lb. per acre. The yields of the Mensury and Two-rowed Chevalier are excellent, and, like many of the results obtained at both stations, would be remarkable yields wherever secured. The yield of 70 bu. 16 lb. for White Hull-less is considerably above the average, and augurs well for the production of such grains as will be necessary for the feeding of live stock.

RATE OF SEED PER ACRE WITH BARLEY.

In this experiment four ¼-acre plots were seeded to Two-rowed Chevalier barley at the rate of ¾, 1, 1¼, and 1½ bushels per acre respectively. All plots were seeded on the same day and all were cut on the same day. The tabulated results are as follows:—

Table 21.—Results of Rate Seeding with Two-rowed Chevalier Barley.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Two-rowed Chevalier	April 23	36	July 19	Aug. 26	125	¼	182	75 40
,,	,, 23	48	,, 19	,, 26	125	¼	874	72 40
,,	,, 23	60	,, 19	,, 26	125	¼	784	65 16
,,	,, 23	72	,, 19	,, 26	125	¼	887	76 44

The results as given above show that all rates of seeding gave excellent results, and while the 72 lb. or 1½ bushels to the acre gave slightly the best results, yet it is not so very much greater than that obtained from the 36-lb. or ¾-bushel seeding. Just why the 60-lb. seeding should give the poorest results is hard to explain. However, this particular plot is only slightly below the rest, and as all the results may be regarded as very good, we are therefore unable to draw any definite conclusions from the above. This experiment stands in the same position as do some others where it is impossible to deduce definite results from the first year's work. It will require the results of a series of years to give records that may be regarded as authentic and dependable. It is interesting to note the results of the above experiment in comparison with the one that follows. In both experiments our own home-grown seed was used. It will be noted that the experiment as given under Table 21 was seeded on April 23rd, while the first plot to be seeded in the following experiment was seeded two weeks later, or on May 7th. The three other plots in the following experiment were seeded respectively on May 15th, 22nd, and 29th, or at intervals of one week. The point to be noted here, however, is the fact that the earlier seeding (April 23rd) has given very much better results than any of the subsequent seedings.

DATE OF SEEDING WITH TWO-ROWED CHEVALIER BARLEY.

In this test four ¼-acre plots were used and each was seeded at the rate of 60 lb. or 1¼ bushels per acre. As noted above, the four plots were seeded one each on May 7th, 15th, 22nd, and 29th, or just seven days apart.

Table 22.—Results of Date of Seeding Two-rowed Chevalier Barley.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Two-rowed Chevalier	May 7	60	July 29	Sept. 11	127	¼	780	65 4
,,	,, 15	60	,, 31	,, 11	119	¼	679	56 28
,,	,, 22	60	Aug. 2	,, 11	112	¼	618	50 48
,,	,, 29	60	,, 1	,, 11	106	¼	792	66 0

It will be noted that the later the seeding the quicker the plots head out, and also the shorter time required to mature. For instance, there are seven days difference in the date of seeding of the May 7th and 15th plots, but there are only two days difference at the time of heading out, and at the time of ripening the May 15th plot had matured in eight days less time than the May 7th plot. If comparison is made of the seedings of May 15th and 22nd and those of May 22nd and 29th in the same manner, it will be found that the above facts may be applied more or less regularly throughout. It must, however, be borne in mind that a very short

ripening period is not always desirable. This will be seen in the case of the May 7th seeding, which required 127 days to mature as compared with 119 days in the case of the May 15th plot, yet the former produced 8 bu. 24 lb. more per acre than the latter. This is also true in comparing the May 15th and the 22nd seeding, but does not follow in the case of the May 22nd and 29th seedings.

It is necessary to mention one thing in connection with the above experiment, and that is that the plots seeded on May 22nd and 29th were both injured somewhat by a frost that came on September 10th. The plots sown on May 7th and 15th were sufficiently mature so that the September 10th frost did no damage whatever, but the two later-sown plots were still somewhat green and consequently were slightly injured.

The last two tables submitted above would indicate that the proper time to seed barley is somewhere between April 23rd and May 15th. These two experiments will be conducted again next year for the purpose of establishing something that may be relied upon with a fair degree of accuracy.

EXPERIMENTS WITH TWO VARIETIES OF FIELD-PEAS.

The same two varieties of field-peas that were tried last year were again grown during the past summer. The Canadian Beauty pea was grown on a ½-acre plot, while the Prussian Blue was grown on ⅕ acre. Both varieties were seeded on the same date, and the following is the result:—

Table 23.—Results obtained from Two Varieties of Field-peas.

Variety.	Date seeded.	Rate of Seed per Acre.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.			Acre.	Lb.	Bu. lb.
Prussian Blue	April 21	60	Sept. 2	134	⅕	327	27 15
Canadian Beauty	„ 21	120	„ 10	142	½	810	27 0

It will be noted that the Prussian Blue, which was seeded only at one-half the rate per acre that was used in connection with the Canadian Beauty, required less time to mature by eight days. With such a light seeding a very rank growth of vine and a prolonging of the date of maturity might easily have been expected. Yet, in spite of this fact, it was found that it requires only 134 days as compared with 142. This point is in its favour as a suitable variety for the Quilchena District, for the tendency is for pea-vines to grow so late in the fall that they are caught with the early fall frosts. This fact is also true in the growing of peas on the Prairies. Consequently, those that require a short time to mature are eagerly sought after.

Both varieties above produced very good yields. In fact, the yield of 27 bushels per acre on a ½-acre plot is excellent for the Canadian Beauty. We are very much encouraged in the growing of peas on both the dry farms. The importance of this crop is apparent when we remember that pea-meal added to barley-chop makes a very excellent fattening food, particularly for hogs.

FLAX EXPERIMENT.

In this test only one variety, which was home-grown seed, was tried. It will be remembered that the grasshoppers failed to damage this particular variety seriously last year. It grew splendidly and produced very superior seed. In fact, the seed showed an official germination test of 100 per cent. The result from the growing of the Premost variety of flax was as follows:—

Table 24.—Results from Premost Flax Plot.

Variety.	Date seeded.	Rate of Seed per Acre.	Date headed out.	Date cut.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.				Acre.	Lb.	Bu. lb.
Premost	April 23	30	July 21	Sept. 11	141	¼	254	16 56

The above flax is the latest developed variety in Canada, and is also one of the earliest maturing varieties. A yield of 16 bu. 56 lb. is very creditable indeed.

FALL RYE.

One plot of fall rye was sown on September 8th, 1914. It sprouted well and produced a very excellent growth during the same fall. The next spring it grew rapidly and was harvested on August 14th. The results from the fall rye plot are as follows:—

Table 25.—Results from ¼-acre Plot of Fall Rye.

Variety.	Date seeded.	Rate of Seed per Acre.	Date cut.	Size of Plot.	Yield per Plot.	Yield per Acre.
		Lb.		Acre.	Lb.	Bu. lb.
Fall rye	Sept. 8, 1914	70	Aug. 14, 1915	¼	748	53 14

The fall rye produced 53 bu. 14 lb. per acre, which was a very large yield. There is no doubt about the fact that this crop will grow and produce excellent results on the Commonage. It may be used to good advantage as pasture in the fall, and still produce excellent returns the following year. It has also proven to be valuable as an early spring pasture. In some instances we have known it to be pastured until June 1st, and then allowed to mature and produce a fair amount of good seed.

GERMINATION OF GRAIN AT QUILCHENA.

Before turning to a discussion of the grasses, roots, and vegetables grown at Quilchena, an official germination test of the samples of grain grown on the various plots on the Quilchena Commonage is appended. It is found that 86.3 per cent. of all grains have a germination of 90 per cent. or better, which is regarded as very good indeed.

Table 26.—Complete Germination Record of all Grains produced at Quilchena.

	Percentage Germination.
Varieties of wheat—	
Marquis	99.5
Huron	99.5
Red Fyfe	98.5
Prelude	97.0
Durum	97.0
Kubanka	94.5
Galgalos	88.5
Ghirka	84.5
Varieties of oats—	
Banner	99.5
O.A.C. No. 72	99.5
Sixty-day	99.0
Abundance (Regenerated)	99.0
Abundance	98.0
Garton No. 22	97.0
Varieties of barley—	
Two-rowed Chevalier	100.0
White Hull-less	97.5
Mensury	97.0
Smyrna	86.0
Varieties of peas—	
Canadian Beauty	94.5
Prussian Blue	93.0
Variety of flax—Premost	100.0
Variety of fall rye—Fall rye	99.5

In the germination results as given for the wheats it will be noted that all except two are above 94.5 per cent. In the case of Ghirka it is only 84.5 per cent. Just why this should be cannot be imagined, as the Ghirka wheat was seeded at the same time as the majority of the wheats, and was cut when fully matured on September 6th. The Galgalos shows a germination of 88.5. This in itself is not by any means exceptionally low, but may be accounted for by the fact that the Galgalos was received from Montana very late and was only seeded on May 12th. This, no doubt, partially accounts for the comparatively low germination test. If it had been seeded at the same time as the rest of the wheats, it is anticipated that the Galgalos would have had a vitality that would be just as high as the other varieties. This same variety has given very superior results in the dry-farm tests in Northern Montana. With the exception of these two varieties, the germination of the wheats is very creditable indeed.

All of the oats are over 97 per cent. germination, which is very exceptional. Three of the four barleys are over 97 per cent. in vitality. The Smyrna, which is only 86, was received from Montana late in the spring, and consequently has not had an equal chance with the rest of the barleys. The two varieties of peas have respectively a 93 and 94.5 per cent. germination, which is good; while the Premost flax with 100 per cent. and the fall rye with 95.5 per cent. are very excellent germination records.

TAME GRASSES AND LEGUMES.

It will be remembered that ¼-acre plots were seeded to a variety of tame grasses and legumes, so that we might compare same in the matter of hay production. The following table will give the results obtained from the various plots:—

Table 27.—Results of Tame Grass and Legume Tests.

Variety.	Date seeded.	Date cut.	Size of Plot.	Yield per Plot.	Yield per Acre.
			Acre.	Lb.	Lb.
Timothy	April 18, 1914	July 16, 1915	¼	2,325	9,300
Brome	" 21, "	" 7, "	¼	2,160	8,640
Red-top	" 21, "	" 16, "	¼	1,534	6,136
Mammoth red clover	" 18, "	" 16, "	¼	1,237	4,950
Common red clover	" 18, "	" 16, "	¼	804	3,216
Alsike	" 18, "	" 7, "	¼	671	2,684
Alfalfa	" 18, "	" 16, "	¼	633	2,532

Most of the yields for the various grasses and legumes are really remarkable, and are in fact much larger than anticipated. The above results are somewhat abnormal because of the fact that they are the first crop produced on land that was broken in 1913. This land was broken and thoroughly cultivated in 1913 and the grass-plots sown in the spring of 1914. On account of the grasshopper plague in 1914 the most of these plots were eaten down to the ground. They did not therefore grow very well, and consequently very little of the available plant-food in the soil was called for. Thus the crop of 1915, aided by opportune showers during the summer, found very congenial conditions for growth, and with the large amount of available plant-food ready to be taken up produced the large crops noted above. There was nothing abnormal in the method that was followed, either to cultivate for or to seed the grass and legume crops, but the grasshoppers prevented some of them growing in 1914, which saved both plant-food and moisture for the 1915 crop. We feel it necessary to make the above explanation to account for the very large yields recorded in the above table; and while we confidently expect to have good yields from our grass and legume plots next year, yet it would be beyond reason to expect yields comparable with the above. The yield from the timothy-plot is very exceptional for dry-land work, and it is rather surprising to see it larger than the brome-grass yield, which is also large. The red-top occupies its relative place in this list as a producer, as compared with timothy and brome-grass. Of the legumes, the mammoth red clover produced almost 2½ tons per acre, which is very good indeed; the common red clover 1½ tons, while the alsike and alfalfa produced slightly over 1¼ tons. The legume results are regarded as somewhat normal yields because of the fact that,

with the exception of alsike, they suffered comparatively little as a result of the grasshoppers in 1914. In fact, the grasshoppers did not seem to relish the alfalfa at all. As these legumes produced fair stands in 1914, the soil-moisture would be largely used up, and this would leave conditions for growth in 1915 almost normal. The yields from the four leguminous crops are very encouraging. If these grow successfully, the hay problem for the settler is practically solved.

SPRING RYE HAY CROP.

Heretofore we have had to draw all our hay for the work-horses on the Commonage from the Minnie Lake District, and as this hay had to be purchased it has been an expensive item. Last spring it was decided to sow 15 acres to spring rye, and by cutting it very early in the bloom intended to provide our own hay.

The success of this plan has been far beyond our expectations, for we cut and stacked one crop, and with an opportune rain or two a second crop came on, which was cut and produced about another one-fifth crop. To give some idea of the crop that was cut from this spring-rye field, the foreman in making a report said: "We are now cutting the spring rye, which is a bumper crop. The binder is being run wide open, with the reel in the top notch, and the knotter as far back as it will go." The crop at maturity stood over 5 feet high, and produced 32 loads all told on the 15 acres. The foreman had no means of weighing the rye, but is quite satisfied that it would yield easily 1 ton to the load, which would give a yield of over 2 tons to the acre. This rye is all properly stacked, and we think that we will have practically all the hay we shall need until next fall.

ROOTS AND POTATOES.

Several varieties of potatoes were grown. The Sutton's Reliance, Beauty of Hebron, Gold Coin, Duke of York, Early Ohio, and Sharp's Victor were tried in ¼-acre plots, while Rennie's Reliance was tried on a $^1/_{20}$-acre tract. The results were as follows:—

Table 28.—Results from Various Plots of Potatoes.

Variety.	Date planted.	Date above Ground.	Date lifted.	Days to mature.	Size of Plot.	Yield per Plot.	Yield per Acre.
					Acre.	Lb.	Lb.
Rennie's Reliance	May 15	June 25	Oct. 20	128	1-20th	526	10,520
Sutton's Reliance	„ 11	„ 21	„ 16	124	¼	1,667	6,668
Beauty of Hebron	„ 11	„ 21	„ 16	124	¼	1,578	6,312
Gold Coin	„ 10	„ 20	„ 14	121	¼	1,473	5,892
Duke of York	„ 10	„ 21	„ 15	122	¼	1,386	5,544
Early Ohio	„ 10	„ 21	„ 15	122	¼	1,144	4,576
Sharp's Victor	„ 10	„ 20	„ 14	121	¼	1,015	4,020

In comparing Rennie's Reliance with the rest of the varieties, some allowance will necessarily have to be made on account of the fact that it was grown on a much smaller plot than the rest. However, it is apparently a first-class yielder. Of the other varieties, Sutton's Reliance holds first place, as it did last year. Beauty of Hebron again takes second place, which is the same as that occupied last year. The rest of the varieties vary considerably from the previous year's yields. While the above yields are not large, yet the quality of the potatoes grown on the Commonage is very excellent. The potatoes boil and bake well, producing a first-class mealy potato.

CARROTS.

At Quilchena two kinds of carrots were tried, the White Field and Red Table varieties. There were each grown on a $^1/_{10}$-acre plot of ground.

Table 29.—Result of growing Two Varieties of Carrots.

Variety.	Size of Plot.	Yield per Plot.	Yield per Acre.	Yield per Acre.
	Acre.	Lb.	Lb.	Bu.
White Field	1-10th	2,500	25,000	416.6
Red Table	1-10th	2,000	20,000	333.3

The above yields are very good indeed, and as the quality was excellent, it indicates what may be done on the Commonage in the way of roots. The field-carrots will be fed to the horses during the winter.

OTHER VEGETABLES.

To say much about the possibility of growing vegetables at Quilchena is to repeat what was said last year, and what has been said with reference to the possibilities of vegetable-growing at 105-Mile House. The simple fact of the matter is that all ordinary garden-vegetables grow excellently. Beets, onions, carrots, cabbage, cauliflower, beans, peas, turnips, etc., of good size and quality were exhibited at Nicola and Merritt. Those exhibited would do credit to any garden.

COMPARISON BETWEEN 105-MILE CONDITIONS AND THOSE AT QUILCHENA.

It is interesting to look at a few comparisons between the Quilchena and 105-Mile Districts. While the one district is considerably farther north than the other, yet there are conditions of climate, temperature, etc., that enter into the growth of crops, and the actual results are surprising, in that there seems to be a very great similarity in the conditions influencing the growth at the two points.

RAINFALL.

As has already been mentioned, the precipitation at both points is very much alike.

Table 30.—Tabulated Rainfall at Quilchena and 105-Mile House.

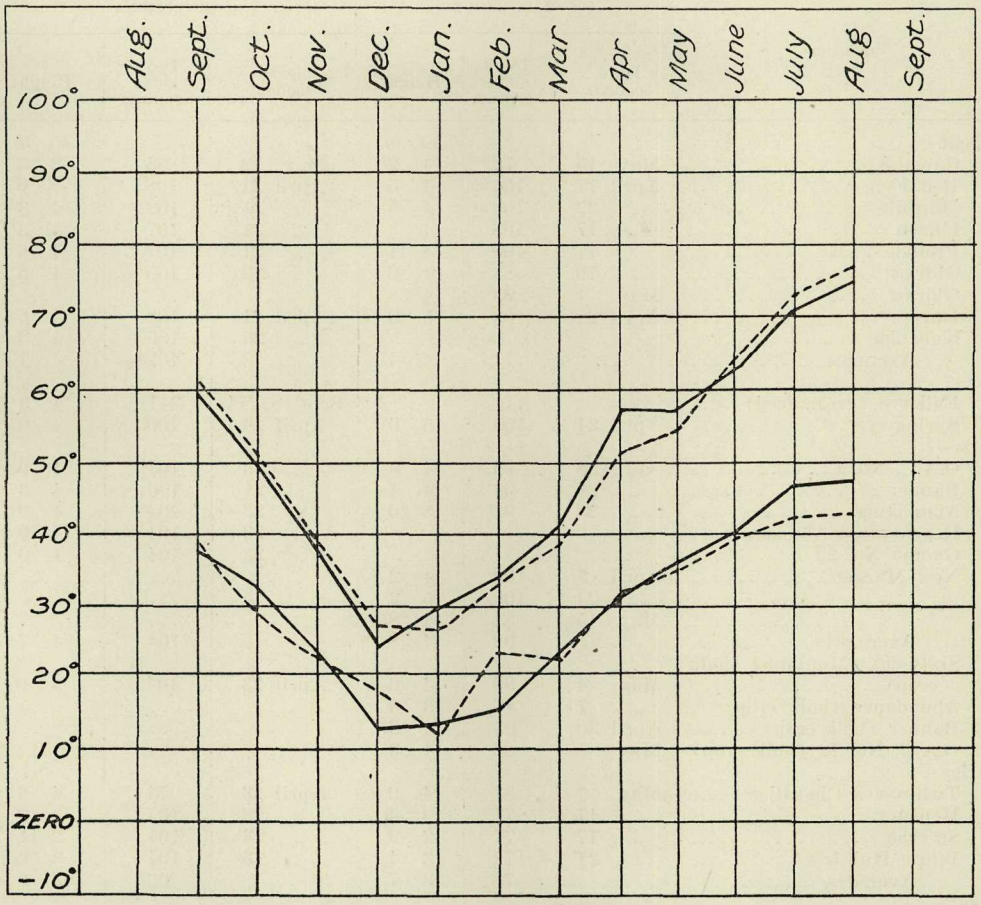
Month and Year.	Quilchena.	105-Mile House.
September 1, 1913, to August 31, 1914	10.34	10.94
„ 1, 1914, to „ 31, 1915	15.203	15.05
Total for two years	25.743	25.99

Thus, there is only a difference of 0.246 inch between the two districts in the total rainfall for two years.

TEMPERATURE.

A glance at the average daily maximum and minimum temperatures for both 105-Mile House and Quilchena will prove to be interesting. In striking the average for two complete years, we find the following: At 105-Mile House the average maximum temperature is 50.29 and the average minimum 30.1; for Quilchena the corresponding maximum and minimum averages are 49.9 and 30.37.

The following chart shows the average monthly maximum and minimum temperatures for the Quilchena and 105-Mile Stations for September 1st, 1913, to August 31st, 1914, and September 1st, 1914, to August 31st, 1915:—



The dotted lines show the average maximum and minimum temperatures, covering two years, at 105-Mile, and the straight lines show the averages at Quilchena.

From the above chart it will be seen what a very great similarity and uniformity there is in the temperatures at the Quilchena and 105-Mile Dry-land Stations.

General Growth of Grain at the Two Stations.

The following table is inserted to show the relative height of the grain grown at Quilchena and 105-Mile House. Samples were taken from all the growing crops on both farms during the first week in August, and a comparison was made of these crops as to general growth up to that time. The table will be found to give a comparison of the height of the grain at both stations. Where blanks appear among the grains, that particular variety was not tried at the particular station. In the matter of the blanks appearing for the grasses and legumes at 105-Mile House, it will be remembered that these plots were used for pasture purposes, and consequently no heights are given.

Table 31.—Showing Comparison of Height of the Grain growing at Quilchena and 105-Mile House during the First Week of August.

Varieties.	105-Mile House.			Quilchena.		
	Date seeded.	Days since seeding.	Height.	Date seeded.	Days since seeding.	Height.
Wheat—			Ft. in.			Ft. in.
Galgalos	May 15	79	4 2	May 12	85	3 3
Red Fyfe	April 17	106	4 5	April 21	108	4 0
Marquis	„ 22	106	4 6	„ 21	102	4 3
Huron	„ 17	108	4 3	„ 21	107	4 3
Prelude	„ 17	108	4 1	„ 21	107	4 6
Ghirka	„ 10	83	4 0	„ 23	105	4 6
Ghirka	May 1	93	4 8	...	...	...
Durum	April 22	106	5 0	April 21	102	4 0
Kubanka	...	...	...	„ 23	105	4 3
Averages	...	...	4 4	...	102½	4 1
Rye—						
Fall rye (green feed)	...	...	...	Sept. 8, '14	341	4 9
Spring rye	April 24	100	5 0	April 24	100	4 9
Oats—						
O.A.C. No. 72	April 28	96	4 9	„ 23	104	4 9
Banner	„ 28	96	4 4	„ 21	106	4 3
Abundance	„ 28	96	5 0	„ 23	104	4 9
Regenerated Abundance	...	...	...	„ 23	104	4 5
Garton No. 22	...	...	...	„ 23	104	4 6
New Market	April 5	109	4 2	...	...	...
„	„ 24	100	5 2	...	...	...
„	May 15	81	4 8	...	...	...
Averages	...	92	4 8	...	104	4 7
Sixty-day (Montana) (bulk crop)	May 4	90	4 6	April 23	104	4 0
Abundance (bulk crop)	„ 7	87	3 6	...	...	...
Banner (bulk crop)	April 30	93	4 3	...	...	...
O.A.C. No. 72 (bulk crop)	May 5	89	4 3	...	...	...
Barley—						
Two-rowed Chevalier	May 7	87	4 0	April 23	71	4 6
Mensury	„ 17	77	4 4	„ 23	104	3 9
Smyrna	„ 17	77	2 9	„ 23	104	2 11
White Hull-less	„ 21	72	3 4	„ 23	104	3 9
Averages	...	78	3 7	...	96	3 8
Peas—						
Prussian Blue	May 21	72	4 6	April 21	106	4 9
Canadian Beauty	...	...	...	„ 21	106	4 6
Flax—						
Premost	May 21	72	2 8	„ 23	104	2 9
Grasses—						
Timothy (cut with mower)	...	...	...	July, 1914	...	3 2
Brome (cut, etc.)	...	...	...	„ „	...	4 4
Red-top (cut, etc.)	...	...	...	„ „	...	2 1
Legumes—						
Mammoth red clover (cut with mower)	...	...	...	„ „	...	2 1
Common red clover (cut with mower)	...	...	...	„ „	...	2 1
Alsike (cut with mower)	...	...	...	„ „	...	2 0
Alfalfa (cut with mower)	...	...	...	„ „	...	2 6

One peculiar fact may be noted in the above table, and that is the height of the grain in the same number of days or even in less time is greater at 105-Mile House than at Quilchena. This fact seems to be more or less uniform.

Another fact that is worthy of notice is that when the same variety of grain is grown at both stations, that grown at Quilchena is much more leafy than that which is grown at 105-Mile House. There was at least 50 per cent. more leaves on the former than on the latter, and this fact was quite evident with all varieties of wheat, oats, barley, peas, and flax.

SUMMER FROSTS AT BOTH STATIONS.

Table 32.—Comparison of the Dates on which Summer Frost occurred at Both Points.

	April.				May.				June.			
	105-Mile.		Quilchena.		105-Mile.		Quilchena.		105-Mile.		Quilchena.	
	1913.	1914.	1913.	1914.	1913.	1914.	1913.	1914.	1913.	1914.	1913.	1914.
1	..	..	..	..	..	..	..	31	..	..	..	..
2	..	..	..	..	..	..	..	31	..	27.2	..	..
3	..	..	..	..	..	..	..	31	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	27	..	31	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..
9	*	..	..	..	..	..	..	..	..	27	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	31	..	..	31	..	29	..	..
12	22	..	..	..	..	..	..	..	..	..	..	..
13	20	..	*	..	..	..	..	..	..	..	..	..
14	24	..	..	..	..	..	..	..	..	..	..	..
15	28	..	..	..	28	..	..	..	..	..	..	..
16	30	..	..	..	29	..	..	31	..	..	..	..
17	30	*	..	..	27	..	..	..	..	..	..	..
18	..	30	..	..	30	..	..	..	..	..	..	..
19	..	..	..	..	..	30	..	..	..	..	..	..
20	..	25	28	..	..	..	..	..	..	..	..	..
21	..	24	20	*	..	..	..	..	..	31	..	..
22	..	24	26	24	..	..	..	..	..	..	..	..
23	..	26	..	23	..	30	..	..	..	..	..	..
24	..	25	..	..	..	..	..	..	..	..	..	..
25	..	30	28	..	..	..	..	..	..	..	..	..
26	31	24	..	..	..	..	..	..	..	..	..	..
27	..	26	..	..	28	31	30	..	..	..	..	..
28	..	29	30	..	..	..	..	..	..	..	..	..
29	..	31	28	29	..	..	..	30	..	..	..	..
30	..	29	..	27	..	30	..	..	..	..	..	..
31	..	..	..	..	..	30	..	..	..	..	..	..

	July.				August.				September.			
	105-Mile.		Quilchena.		105-Mile.		Quilchena.		105-Mile.		Quilchena.	
	1913.	1914.	1913.	1914.	1913.	1914.	1913.	1914.	1913.	1914.	1913.	1914.
1	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	30	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	27.8	..	..
6	..	..	..	..	..	..	..	..	30	..	..	..
7	..	..	..	..	..	..	..	..	..	30	..	..
8	..	..	..	..	31.4	..	..	..	31	31	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	22	29	..	..
11	..	..	..	..	..	..	..	..	..	20	..	31
12	..	..	..	..	..	..	..	..	..	30	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..
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* Seeding begun.

A chart has been prepared showing the dates on which a degree or two of frost occurred during the crop-growing months—viz., from April until September. As a matter of fact, the crops were not sown until after the middle of April and were practically all harvested by September 1st, although some of the later-sown crops in the "date of seeding" experiment were harvested about September 10th.

Seeding commenced on April 17th at 105-Mile House and on April 21st at Quilchena. These dates were exactly nine days later at both places than in 1914.

After April 17th, when seeding commenced at 105-Mile House, from 2 to 7 degrees of frost was experienced every night until April 29th. Some of the grain was in the ground, but, of course, was not injured by the frost. Outside of April frosts at 105-Mile House, the few scattered summer frosts were much the same as last year. These were only a degree or two at a time, and so far as the growing crops were concerned, no evil effect was apparent at any time. In fact, the uniformly large crops produced on both farms is abundant evidence of the fact that these frosts do very little, if any, damage at all.

GENERAL SUMMARY.

Summing up the foregoing, as covering the results obtained in the actual growing of crops at Quilchena and 105-Mile House:—

(1.) There were six different varieties of wheat tried at 105-Mile House, with an average of a trifle over 48 bushels per acre for all varieties; and eight varieties at Quilchena, with an average of 40 bu. 4 lb. for all varieties grown. These yields are excellent. There was not a failure with a single wheat crop.

(2.) Three different varieties of oats were tried at 105-Mile House, which produced an average of 90 bu. 2 lb. per acre. Six varieties were tried at Quilchena, which produced an average of 80 bu. 8 lb. per acre. These yields are again very excellent, and there were no failures at all among the oat-crops.

(3.) Three different varieties of barley were grown at 105-Mile House, with an average of 51 bu. 15 lb. At Quilchena four varieties were grown, producing on the average 79 bu. 38 lb. Again, there were extra heavy yields and no failures whatever among the barleys.

(4.) Among the peas, flax, and fall rye crops, from fair to excellent results have been obtained.

(5.) Among the hays produced at Quilchena all the results are good and many are excellent.

(6.) At 105-Mile House the results from the pasturing of sheep have been good. The value of the mutton produced on an acre amounted to $16.51.

(7.) Various varieties of potatoes were tried on both farms, and the results were very encouraging. The quality of the potato for table use was excellent.

(8.) All common vegetables have done splendidly on both farms.

After carefully considering results obtained at both 105-Mile House and Quilchena for the two years that work has been carried on, we cannot help but feel gratified at the results that have thus far been obtained. We further congratulate the Hon. W. R. Ross, Minister of Lands for the Province of British Columbia, in the fact that the results so far secured justify him in his opinion that these vast so-called dry areas of British Columbia may be of much more value to the Province than when used simply for range purposes.

W. J. ELLIOTT,
Adviser in Charge of Dry-land Investigation Work.

PART II.

SURVEY BRANCH.

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REPORT OF THE SURVEYOR-GENERAL.

December 31st, 1915.

The Hon. William R. Ross, K.C.,
Minister of Lands, Victoria, B.C.

SIR,—I have the honour to submit the following report of the Survey Branch of the Lands Department for the year ending December 31st, 1915:—

The conditions under which the work of this Branch has been carried on during the past year have been abnormal. For several years past the annual appropriation for surveys has been so large as to permit of extensive surveying operations being carried out, the occupation of land by pre-emptors has been going on in all parts of the Province, and the statutory provision providing that the survey of all timber limits must be completed within a definite time has resulted in the survey of a large area of timbered land. This year, on the contrary, owing to conditions arising from the war, the vote for surveys has been reduced very materially, immigration to the Province has practically ceased, and the financial conditions prevailing have rendered it impossible, in the majority of cases, for the owners of rights to timbered and other lands to proceed with the survey of same. Consequently the area surveyed during the year is a fraction only of what has been done in recent years. The area surveyed by this Branch during the year 1914 was 1,012,000 acres; this year it was 127,000 acres. The area surveyed privately in the former year was 1,442,200 acres; this year it is only 615,300 acres.

In the report for the year 1912 the programme of the Branch was outlined in detail, and included the definition by survey of district boundaries, the survey of vacant Crown lands adjacent to railways under construction, the tying-in of all isolated surveys made at an earlier date, and the preparation of land maps of various sections of the Province.

With 2,000,000-odd acres of vacant Crown lands surveyed in advance of settlement adjacent to the new railways, practically all the district boundaries defined for which there is any pressing necessity, and with complete land maps of practically all the inhabited sections of the Province, the programme referred to may fairly be said to have been so far carried out as to render it possible for the activities of the Branch to be materially reduced until the revival which may be anticipated at the end of the present war without serious inconvenience to the interests of the public.

Active surveying operations should be resumed in advance of the revival of immigration, and in the interval surveys should invariably be carried out where the same appear to be required, as otherwise the good results obtained by the extraordinary efforts and expenditure of recent years will be lost.

With the exception of the survey of the Alberta - British Columbia Boundary and the topographic survey of the Okanagan Valley, no survey-work has been undertaken by the Branch for which there was not an immediate and pressing necessity, and the surveys made consist almost entirely of the subdivision of logged-off lands, which, under the present practice of the Department, are subdivided for settlement before being withdrawn from the reserve covering timbered lands, including lands from which the timber has been removed, and the survey of areas in which actual settlement was taking place and where it was apparent that complications would arise were the survey left in abeyance until such time as pre-emptors had made improvements of some material value.

As land surveys made for administrative purposes by any branch of the Government service are made under the direction and at the expense of this Branch, a proportion of the annual appropriation is each year consumed in necessary work which does not show in the annual report of this Branch. In planning out the season's operations, provision had to be made for expenditure of this nature, which, with the greatly reduced vote at the disposal of the Branch, would consume a proportionately larger share than is usually the case.

The practice of former years of sending out surveyors for the entire season in charge of large survey parties was this year abandoned. No parties were sent out in the early spring, and to a limited number of surveyors two or three months' work only was allotted during the

summer months, while the strength of the parties was very materially reduced, and, as already stated, the surveyors were assigned to districts where there was absolute necessity for surveying to be done. The results may, on the whole, be considered satisfactory. The average cost of survey per acre is greatly in excess of that of former years, which was only to be expected, as the most economical way of surveying Crown lands is to carry on operations on a large scale; but, on the other hand, the Branch may fairly be said to have succeeded in doing all the work throughout the Province for which an actual necessity has arisen, in addition to subdividing for settlement the best areas of logged-off lands in accessible localities.

It has been pointed out in former reports that the area of land surveyed privately must rapidly decrease from year to year, owing to the reserve from sale or lease of the greater portion of the Crown lands of the Province, and the gradual completion of the survey of lands already under application and timber licence. The phenomenal decrease in the area surveyed this year is, however, due in great part to the financial conditions arising from the war, and from figures given in the report of the Chief Draughtsman, attached hereto, it will be noted that the Branch has this year avoided, as far as has been practicable, insisting on such surveys being carried out.

The natural effect of the reduction in the area surveyed has been to reduce the volume of work to be handled by the office staff. The great majority of the staff of this Branch are temporary clerks and draughtsmen who were appointed in the year 1911 on the reorganization of this Branch, and it is a source of no little gratification to be able to report that the enlistment of members for foreign service has reduced the strength of the staff automatically with the reduction in the quantity of work to be handled. The staff, including that of the Geographic section, numbered, at the beginning of the war, sixty. It was, at the beginning of the year, forty-seven, and is now thirty-five, and in the latter figure is included one junior whose appointment became necessary from the fact that every junior on the staff had joined the colours.

In assigning survey-work to surveyors, care was taken to select men who have during recent years made surveys for this Department, and have consequently, to a greater or less degree, neglected their private practice, as it was felt to be only fair that men who had worked for the Department in busy years should be given preference in lean years.

The sudden closing-down, occasioned by the war, of all activity in the matter of land surveys is naturally a serious matter for the members of the surveying profession throughout the Province. The situation has, however, been relieved by the enlistment for foreign service of eighty-nine British Columbia land surveyors, or slightly over 40 per cent. of the total number.

In the reports of former years will be found a general description of the physical characteristics of the various sections of the Province, as well as of the nature of the survey-work carried on in each, and the general organization of survey parties. It is consequently unnecessary this year to describe at length the field operations, but in the brief summary which follows the sections into which the Province has been divided for descriptive purposes is adhered to.

CENTRAL INTERIOR.

In the Central Interior of the Province—that is, the area lying between the Coast and the Rocky Mountains and to the north of the Dominion Railway Belt, and being the section through which the new railways are constructed or are approaching completion—the work of this Branch during the past years has been very extensive, and in this section there are now over 2,000,000 acres of land surveyed in advance of settlement. This year the number of parties employed in this section was reduced to seven. The following surveyors were employed in the localities indicated:—

A. W. Harvey ..... Between Francois and Ootsa Lakes.
F. Butterfield ..... Vicinity of Fraser Lake.
A. H. Holland ..... North-east of Fort George.
R. W. Haggen ..... Quesnel River.
A. F. Cotton ..... Eastern Portion of Lillooet District.
W. S. Drewry ..... Sheridan Lake.
R. H. Lee ..... North Thompson River.

In all cases these men had smaller parties and were employed for a shorter period than has been the practice in recent years, and work was allotted to them where there was an actual demand for the survey of land arising from actual settlement taking place.

It is interesting to note that surveyors working in this section can now reach their work by the Grand Trunk and Canadian Northern Pacific Railways, thus avoiding the long and expensive journey over the Cariboo Wagon-road from Ashcroft, and the expense to the Department of large pack-trains to keep the parties in supplies during the season.

Southern Interior.

In the Southern Interior—that is, the section of the Province lying between the Coast and the Rocky Mountains and to the south of the Dominion Railway Belt—the number of the parties employed was five. The following is a list of the surveyors employed and the localities in which they were engaged:—

O. B. N. Wilkie ..... Nicola District.*
R. P. Brown ..... Princeton Crossing.
H. C. A. Cornish ..... Blueberry Creek, West Kootenay.
A. H. Green ..... Little Slocan River, West Kootenay.
A. W. McVittie ..... Moyie River, East Kootenay.

For many years past the work done by this Branch in this section has not been extensive. The section in question comprises the older-settled portions of the Interior, and the quantity of vacant Crown land available in any one locality would not warrant the employment of large survey parties. The work this year has been similar to that carried on in former years—viz., the survey of comparatively small areas where active settlement is taking place and the subdivision of logged-off timber lands.

Coast District.

The mountainous nature of the Mainland Coast of British Columbia, and the fact that the river-valleys and flat land generally are covered by a heavy growth of merchantable timber held under timber licences or leasehold, has rendered it impossible for this Department to make extensive surveys. The practice of recent years has been continued, and the work practically confined to the subdivision into small holdings for settlement of logged-off land. The following surveyors were employed in the localities indicated:—

G. J. Jackson ..... Gibson Landing.
J. E. Laverock ..... Sechelt Inlet.
N. F. Townsend ..... Malaspina Inlet.
H. H. Roberts ..... Read Island.
F. Tupper ..... Alert Bay.

Subdivision in this district is into parcels of 40 acres, as against 160 acres elsewhere in the Province. The number of such holdings surveyed this year is approximately 200, any or all of which can be made available for pre-emption in the near future.

Experience the last few years has shown that lands of this nature are in active demand, due no doubt to the facilities for water transportation and the proximity to the larger cities of the Lower Mainland Coast.

Vancouver Island.

The conditions on Vancouver Island throughout that portion under the jurisdiction of the Provincial Government, with the exception of the northern end, are similar to those of the Coast District above referred to.

A considerable portion of Rupert District, at the northern end of the Island, is comparatively level, and in the early history of the Province a system of townships was projected on the maps of the Province and outlines were laid down on the ground. Owing to the incompleteness of these surveys, very considerable confusion has arisen in recent years when actual settlement has taken place, and during the past few years the entire area has been resurveyed. This work is now approaching completion.

During the past season H. H. Browne and L. S. Cokely were engaged on this work.

In addition to these surveyors, A. I. Robertson was employed in the vicinity of Nitinat Lake, and H. N. Clague in the surveying of logged-off lands on the west coast.

Queen Charlotte Islands.

F. Nash and J. C. A. Long were employed in completing work undertaken in former years in the vicinity of Skidegate Inlet.

During recent years very considerable surveying-work has been done by this Department on Graham Island, with the result that nearly all the arable portions of the island and lands held under coal-prospecting licences have been surveyed, and the conditions arising from the confliction of stakings referred to in previous reports have been adjusted.

TOPOGRAPHIC SURVEY OF OKANAGAN VALLEY.

R. D. McCaw continued this year the survey of the watershed of Okanagan Lake commenced by him at the beginning of last season. This work differs entirely in its nature from other work done by this Branch, and was undertaken originally at the request of the Water Branch. The photo-topographic method enables a surveyor to obtain in a comparatively short season topographical information in regard to a considerable area of country. The work involved in the compilation of plans, etc., from this information takes, however, considerably more time than is the case with surveys made by other methods.

In view of the comparatively small expense of a photo-topographic survey and the value of the information obtained, it was considered advisable this spring to continue this work. The field-work done will permit of the mapping of about 325 square miles of country, much of which is the more valuable fruit-growing section of the Okanagan Valley, maps of which will be of the utmost value in considering the question of irrigation. The Branch is again indebted to E. Deville, Esq., LL.D., Surveyor-General of Dominion Lands, for the use of photo-topographical surveying instruments.

INTERPROVINCIAL BOUNDARY SURVEY.

The survey of the boundary between the Province of Alberta and British Columbia was, by arrangement between the Governments of the Dominion, Province of Alberta, and this Province, placed under direction of a Commission, the cost being borne in equal proportions by the three Governments. The work has been carried on for two years, and it was considered inadvisable this year to suspend operations. At a meeting held in Edmonton in May last, between the Surveyor-General of Dominion Lands, the Director of Surveys of the Province of Alberta, and the Surveyor-General of British Columbia, it was decided that the work be proceeded with under a reduced appropriation. The report of A. O. Wheeler, B.C.L.S., Commissioner for British Columbia, is attached hereto and describes in detail the work of the Commission.

MISCELLANEOUS SURVEYS.

In addition to the above-mentioned surveyors who were employed on more or less extensive survey-work, seven surveyors were employed at various times for short periods on miscellaneous surveys throughout the Province.

PRIVATE SURVEYS.

The surveys above described are those made under the direction and at the cost of this Branch. The Branch has, however, a general supervision over all surveys of Crown lands throughout the Province made at the expense of private parties who may have acquired interests in unsurveyed Crown lands by pre-emption record, application to purchase or lease, coal-prospecting or timber licences, etc. This Branch also deals with the notes of survey of rights acquired under the "Mineral Act." Surveys of this nature are generally termed "private surveys."

As already stated, the area surveyed by private survey is this year a fraction only of that done in recent years. The Appendix to this report, Table A, gives the area of every class of survey for each year from 1900 to date, the figures given being the amount of land the field-notes of which have been dealt with and gazetted during the calendar year. As, however, the end of the calendar year follows so closely the end of the surveying season, a large volume of field-notes is, as a rule, dealt with in the following year. The table is therefore not strictly accurate, but furnishes, under ordinary circumstances, a fair comparison between the work done each year. This year, however, it is probable that practically all field-notes of surveys made during the year 1915 have been dealt with in this office, and the figures given are therefore relatively higher than they should be, as they include a portion of the work done in 1914 and nearly all that done in the current year.

In concluding this report, some reference to the Geographic section would appear to be in order. This section of the Branch was organized in 1912 to prepare and to superintend the publication of lithograph maps. For some years prior to the above date no lithograph maps had been published by this Department, and there was an insistent demand on the part of the public for new and up-to-date maps. G. G. Aitken resigned from the staff of the Geological Survey at Ottawa to assume the position of Chief Geographer, and gathered around him a staff of technical draughtsmen, with the result that it may be fairly claimed that the maps published by the Province of British Columbia are not only more numerous, but are equal in every particular to the best maps published by any Province in the Dominion. Mr. Aitken, together with the majority of the members of his staff, have obtained leave of absence and are now in training for military service at the front. It is therefore improbable that during the continuation of the war the remaining members of the staff will be able to do more than keep up to date and republish existing maps.

Attached to this report will be found that of the Chief Draughtsman, which describes in detail the work of the general staff for the past year, and refers to that of the Geographic section.

Following the procedure of former years, there is attached to this report the reports of surveyors who have been employed during the season on field-work, and attention is particularly drawn to the report of G. B. Milligan, B.C.L.S., on the Peace River District, which was received too late to incorporate in the last Annual Report, and which describes his explorations during the years 1913 and 1914.

All tabular statements of comparative statistics, etc., which have appeared in former reports are this year attached as appendices.

I have the honour to be,
Sir,
Your obedient servant,
G. H. DAWSON,
Surveyor-General.

REPORT OF THE CHIEF DRAUGHTSMAN.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

December 31st, 1915.

Sir,—I have the honour to submit the following report on the work of the Survey Branch for the year ending December 31st, 1915:—

The work of the General Office has been carried on along the same lines as in 1914. There has been a considerable decrease in the volume of work handled owing to the reduction in the amount of surveys being made. There has been a reduction in the staff from thirty-seven at the beginning of the year to thirty-one at the present date, being a total reduction of about 40 per cent. since the beginning of the war. These figures are exclusive of the Geographic Sub-branch, which will be referred to later. It is satisfactory to note that as work decreased there has been a corresponding decrease in the staff, which has been brought about entirely by the enlistment of certain members in the Army.

During the year, 1,774 field-books have been received, containing notes for 2,836 lots. During the same period, 4,184 lots have been plotted and gazetted and tracings prepared and forwarded to the Government Agents. The following table gives an analysis of the acreages of gazetted surveys for the year:—

	Acres.
Pre-emption records	22,745.9
Purchase claims	41,550.6
Mineral claims	8,339.4
Timber licences	512,628.0
Coal licences	29.245
Lease of lands and foreshores	841.4
British Columbia Government	705,170.0
Total	1,230,520.3

A comparison of these figures with those of the previous years as far back as 1900 can be made by referring to Table A attached to this report. There has been a marked decrease in all private surveys, with the exception of mineral claims, in which there is a slight increase, which would tend to indicate that the war has had no depressing effect on the mining industry of the Province.

The practice adopted last year of gazetting the acceptance of mineral claims only when the owner gives notice of his intention to apply for certificate of improvements has been continued this year. The figures given in Table A are for surveys actually gazetted, whereas the acreage of mineral claims for which field-notes have been received during the year amounts to 16,546 acres, as compared with 16,167 acres for the previous year.

It might also be explained that a greater portion of the acreage included in the item "British Columbia Government" in the above table refers to areas surveyed during 1914, the field-notes of which were not received or could not be dealt with until the early part of 1915.

NOTICES AND EXTENSIONS OF TIME TO SURVEY.

During the past year notices to survey were issued, affecting thirty-four timber licences, and extensions for various periods were granted for thirty-nine licences. Extensions of time to survey applications to purchase land were granted to 212 applicants, twenty-four of these being first extensions, and the remainder covering applications outstanding for one year or more and granted with the forfeiture of rights of priority over any subsequent applications which might be involved and which might be surveyed in the meantime.

During the year railway-location plans have been received for 250 miles of line. Plans of survey of right-of-way for 755 miles have been filed and dealt with. These plans are used for the elimination of right-of-way from adjoining lands when available, and subsequently as a basis for granting the right-of-way to the railway company. Plans have been examined and accepted for Crown-granting purposes for 300 miles of right-of-way.

CLEARANCES.

All applications for land under the "Land Act" are referred to this Branch for a clearance report as to the status of the lands applied for. During the past year forty-three applications to purchase and 2,500 applications for pre-emption have been dealt with. The corresponding figures for 1914 were 201 and 4,283 respectively. All applications, when cleared, are entered on departmental reference maps, as are also cancellations of pre-emption records, of which 1,590 were noted. Crown grants to the number of 676 have been cleared, as well as 198 applications for coal licences or leases—224 for hand-loggers' licences and 413 timber sales or permits.

In addition to the above, the staff has been called upon to issue clearances to the Forest Branch in connection with timber licences applied for in perpetuity and licences issued over old timber leases. Numerous areas which have been found on examination by officials of the Forest Branch to be timber lands within the meaning of the "Land Act" have been noted on departmental reference maps. Upon receipt of advice of the cancellations and expiration of certain rights under the "Forest Act," suitable notations are made on the maps.

REFERENCE MAPS.

Owing to the reduction in staff and the large amount of Government surveys made during 1914 which required to be dealt with during the early part of the year, it was impossible to devote as much attention as might otherwise have been done to the remaking of departmental reference maps. Twenty-two maps were remade this year, covering an area of 46,620 square miles. The majority of these cover the older portions of the Province and contain more detail than maps of the more outlying portions. The style of these maps is being constantly improved, and considerable care and attention is taken to have the information as complete and authentic as possible.

INFORMATION SUPPLIED TO SURVEYORS AND OTHERS.

A nominal charge is made for the preparation of copies of field-notes, blue-prints, etc., applied for by surveyors in private practice or by other parties who may require information which takes up more or less of a draughtsman's time. The revenue derived from this source during the year amounts to $1,660.89. The Division dealing with this work dealt with 653

letters, of which 420 were requests for blue-prints and the remainder for copies of field-notes, plans, etc. Copies of 287 sets of field-notes and 865 tracings were prepared in this connection.

The following is a statement of the number of blue-prints made during the year:—

Counter orders	431
Mail orders	690
Government Agents	1,697
Works Department	1,545
Forest Branch	762
Water Branch	190
Departmental	4,666
Sundry	820
Total	10,801

There have also been prepared 647 tracings in duplicate to be attached to Crown grants, as well as sixty-seven tracings, also in duplicate, to be attached to leases of coal lands, foreshore, etc.

General.

In addition to the work outlined above, the drafting of instructions to surveyors, routine correspondence occupies a large amount of time and attention. The records show that 8,219 letters were received and 7,068 sent out during the year.

The accountant has dealt with survey accounts to the amount of $229,842.

Considerable miscellaneous work of which no detailed record can be given has been attended to, such as the preparation of descriptions, special maps, reports, and the compilation of statistics from departmental records.

The work of compiling the volume of reference to the general reports and information of interest pertaining to various parts of the country referred to in previous reports has been continued and brought up to date, as well as the classification and mounting of photographs. The time spent in this compilation has been amply justified by the convenience afforded by it in obtaining a reference to all available data regarding any particular section of the Province. The photographs, being arranged to conform in system with the reference volume, are readily available to illustrate the reports.

A commencement has been made on the preparation of special plans of surveyed vacant Crown lands, showing by means of annotations the nature of the ground, character of soil, and other information contained in the field-notes that might be of interest to a prospective settler. In recent years surveyors employed on Government surveys have been required to furnish plans on tracing-linen showing this information, and blue-prints are forwarded to the Government Agents in whose districts the lands are situated. The plans now being prepared cover areas for which no surveyors' plans of this nature were furnished, and it is hoped that the blue-prints of these which are being supplied to the various recording offices will be of some assistance to land-seekers.

A summary statement of the office-work and the corresponding figures for 1914 will be found in Table E attached to this report.

Geographic Sub-branch.

The staff of the Geographic Sub-branch has been very much depleted during the year owing to the enlistment in the Army of five of its members, including G. G. Aitken, Chief Geographer, leaving only three men to carry on the work during the coming year.

Maps published.

The following is a list of the maps which have been published during the year:—

Pre-emptors' Series—

No. 3A. Fort George. Revised and printed.
,, 3B. Nechako. Revised and printed.
,, 3D. Bulkley Valley. Recompiled and printed.
,, 3F. Chilcotin. Revised and printed.
,, 3G. Quesnel. Revised and printed.

Pre-emptors' Series—*Concluded.*

No. 3H. Tete Jaune. Revised and printed.
„ 3J. North Thompson. Revised and printed.
„ 3K. Lillooet. Recompiled and printed.
„ 3L. Graham Island. Compiled and printed.
„ 3M. Prince Rupert. Compiled (not yet printed).

Geographic Maps—

No. 1EM. Kootenay, Osoyoos, and Similkameen, showing Mining Divisions.
„ 1ER. Kootenay, Osoyoos, and Similkameen, showing Land Recording Divisions. Scale, 7.89 miles to 1 inch.
„ 1G. Cariboo and Adjacent Districts. Scale, 7.89 miles to 1 inch.

All pre-emption maps were republished with the exception of the Stuart Lake and Peace River Sheets, for which the additional information available did not justify a new issue. A new sheet of the pre-emptors' series, covering the area lying between the Bulkley Sheet and the Coast, and known as "No. 3M, Prince Rupert," has been compiled and will be ready for the printers early in the new year.

The map of the Kootenay, Osoyoos, and Similkameen Districts on the scale of 7.89 miles to 1 inch, described in the report of the Chief Geographer for 1914, was the first of a series of geographic maps and was issued in April last. Another map of this series, entitled "Cariboo and Adjacent Districts," is now in the hands of the printers, and it is expected that it will be available for distribution before the end of January. The map covers the greater portion of what is generally termed the Central Interior of the Province.

A geographical map on the scale of 17.75 miles to 1 inch has been compiled of the northern portion of the Province, showing the information obtained through various exploratory surveys carried out during recent years. This map has been delayed by reason of the reduction in the staff, but it is hoped that it will be possible to publish it some time during the coming year.

No new maps of the land series have been published this year, but a partial compilation has been made of the northerly portion of Vancouver Island, which when completed will conform with the map of the southerly Vancouver Island published in 1913.

In addition to the above, several maps of a miscellaneous character have been prepared and printed during the year, including a map of the Province showing the Provincial electoral districts as defined by the "Constitution Act" as amended in 1915, and smaller compilations for insertion in pamphlets issued by the Department.

A number of maps have been prepared for printing for the Department of Mines to be inserted in the Annual Report of that Department. Certain sketches were also drawn for the report of the Fisheries Department.

It is proposed during the coming year to keep up to date as far as possible by correcting and republishing, when necessary, the existing maps, as with the small staff remaining it will probably not be possible to undertake any new compilations beyond the completion of the map of Northern British Columbia already referred to.

I have, etc.,
J. E. UMBACH,
Chief Draughtsman.

APPENDIX TO REPORT OF CHIEF DRAUGHTSMAN.

Table A.—Showing Acreages of each Class of Surveys gazetted each Year since 1900.

Year.	Pre-emptions.	Purchases.	Mineral Claims.	Timber Limits.	Coal Licences.	Leases.	B.C. Govt. Surveys.	Totals.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1900	22,873	4,419	33,441	59	...	664	10,057	71,513
1901	26,493	16,401	33,400	2,207	...	593	...	79,094
1902	35,297	29,652	31,057	1,040	626	1,026	...	98,698
1903	37,615	26,787	18,115	127,992	...	2,003	800	213,312
1904	48,124	36,468	20,549	155,279	48,670	3,009	179	312,278
1905	42,660	58,705	15,535	214,841	137,218	806	107	469,872
1906	33,573	66,668	9,894	77,829	41,312	9,566	...	238,842
1907	50,460	162,218	10,017	83,016	20,367	4,387	113,968	444,433
1908	66,788	147,980	14,607	167,925	9,821	2,580	97,072	506,773
1909	71,316	145,325	10,744	426,121	8,310	15,239	512,373	1,189,428
1910	79,273	455,356	12,499	509,201	43,363	5,864	302,536	1,407,912
1911	89,485	1,352,809	21,325	686,909	120,938	6,500	948,644	3,226,610
1912	99,461	1,011,934	16,645	804,730	99,236	8,560	826,362	2,866,997
1913	55,202	508,062	18,043	1,181,355	72,719	4,740	1,014,366	2,854,487
1914	45,551	234,580	7,546	1,105,635	36,098	4,209	1,078,579	2,512,198
1915	22,746	41,551	8,339	512,628	29,245	841	705,170	1,320,520

Table B.—Showing Proportion of Government Surveys to Total Land Surveys since 1900.

Year.	Total Surveys.	Govt. Surveys.	Proportion of Govt. Surveys to Total.
1900 to 1906	907,373	11,143	0.012
1907 to 1911	4,901,984	1,974,593	0.403
1912	2,062,267	826,362	0.401
1913	1,673,132	1,014,366	0.606
1914	1,415,186	1,078,579	0.762
1915	807,892	705,170	0.872

Table C.—Showing Number of Alienated Parcels and Approximate Acreages remaining unsurveyed at the End of each of the Years 1912, 1913, 1914, and 1915.

	1912.	1913.	1914.	1915.	Estimated Area.			
					1912.	1913.	1914.	1915.
					Acres.	Acres.	Acres.	Acres.
Applications to purchase	2,128	1,097	730	604	1,300,000	658,000	417,000	342,000
Pre-emption records ..	2,800	1,745	2,900	1,934	310,000	179,000	295,000	242,000
Coal licences	2,202	1,510	1,240	1,313	1,400,000	900,000	748,000	792,000
Applications to lease..	70	95	90	100	...	...	...	...
Timber licences	8,600	6,000	5,000	4,300	5,450,000	3,840,000	3,200,000	2,688,000
Totals	15,800	10,445	9,760	8,247	8,460,000	5,577,000	4,660,000	4,064,000

TABLE D.—SHOWING AREAS OF SURVEYED LANDS AVAILABLE IN THE VARIOUS LAND DISTRICTS.

District.	Area Available. Acres.
Cassiar	147,518
Cariboo	766,318
Coast Range 5	238,004
Coast Range 4	205,785
Lillooet	519,319
Kamloops	69,686
Queen Charlotte Islands	213,477
Peace River	126,886
Rupert	26,443
Nootka	2,909
Similkameen	22,005
Kootenay	25,553
Sayward and New Westminster	16,430
Osoyoos	9,180
Texada	1,096
Yale	3,865
Clayoquot	1,506
	2,395,980

NOTE.—This table does not include some of the smaller districts in which the amount of surveyed lands available for pre-emption is practically negligible.

TABLE E.—SUMMARY OF OFFICE-WORK FOR THE YEAR 1915 AND COMPARATIVE FIGURES FOR 1914.

	1914.	1915.
Number of field-books received	3,398	1,774
" lots surveyed	6,141	2,836
" lots gazetted and tracings forwarded to Government Agents	6,617	4,184
" miles of railway-location plans received	525	250
" miles of right-of-way plans received	180	755
" applications for purchase cleared	201	43
" applications for pre-emption cleared	4,283	2,500
" cancellations and abandonments of pre-emptions	2,342	1,590
" reference maps compiled	33	22
" reference maps retraced	3	..
" Crown-grant applications cleared	1,260	676
" letters asking for information dealt with	356	233
" letters asking for blue-prints dealt with	391	420
Total number of letters received by Branch	11,394	8,218
" " Crown-grant and lease tracings made in duplicate	1,372	714
" " blue-prints made	14,235	10,801
Total revenue from information, blue-prints, maps, etc.	$2,726.45	$1,660.89

Table F.—List of Lithographed Maps.

Map No.	Year of Issue.	Title of Map.	Scale.	Per Copy.	Per Dozen.
		Geographic Series—			
1A	1912	British Columbia. In four sheets. Showing roads and trails, railway systems, etc	18 m. to 1 in.	$1 00	$10 00
1B	1913	British Columbia. In one sheet. Showing Land Districts	30 m. to 1 in.	25	2 00
1C	1913	British Columbia. In one sheet. Showing Land Recording Divisions	30 m. to 1 in.	25	2 00
1D	1913	British Columbia. In one sheet. Showing Mining Divisions	30 m. to 1 in.	25	2 00
1E M	1915	Kootenay, Osoyoos, and Similkameen. Showing Mining Divisions	7.89 m. to 1 in.	25	2 00
1E R	1915	Kootenay, Osoyoos, and Similkameen. Showing Land Recording Divisions	7.89 m. to 1 in.	25	2 00
1F	1915	British Columbia. In one sheet. Showing Electoral Divisions	30 m. to 1 in.	25	2 00
‡1G	1915	Cariboo and Adjacent Districts. Showing Land Recording Divisions (probable date of publishing, Jan. 1916)	7.89 m. to 1 in.	25	2 00
		Land Series—			
2A	1913	Southerly Vancouver Island	4 m. to 1 in.	25	2 00
2B	1914	New Westminster and Yale Districts	4 m. to 1 in.	25	2 00
		Pre-emptors' Series—			
3A	1915	Fort George	3 m. to 1 in.	Free	1 00
3B	1915	Nechako	3 m. to 1 in.	Free	1 00
3C	1914	Stuart Lake	3 m. to 1 in.	Free	1 00
3D	1915	Bulkley Valley	3 m. to 1 in.	Free	1 00
3E	1914	Peace River	4 m. to 1 in.	Free	1 00
3F	1915	Chilcotin	3 m. to 1 in.	Free	1 00
3G	1915	Quesnel	3 m. to 1 in.	Free	1 00
3H	1915	Tete Jaune	3 m. to 1 in.	Free	1 00
3J	1915	North Thompson	3 m. to 1 in.	Free	1 00
3K	1915	Lillooet	3 m. to 1 in.	Free	1 00
3L	1915	Graham Island, Queen Charlotte Islands	3 m. to 1 in.	Free	1 00
†3M	1916	Prince Rupert	3 m. to 1 in.	Free	1 00
		Degree Series—			
*4A	1912	Rossland Sheet	2 m. to 1 in.	$0 10	..
*4B	1912	Nelson Sheet	2 m. to 1 in.	10	..
*4C	1912	Cranbrook Sheet	2 m. to 1 in.	10	..
4D	1913	Fernie Sheet	2 m. to 1 in.	10	..
4E	1913	Upper Elk River Sheet	2 m. to 1 in.	10	..
4F	1913	Duncan River Sheet	2 m. to 1 in.	10	..
4G	1914	Windermere Sheet	2 m. to 1 in.	10	..
‡4H	1915	Arrowhead Sheet	2 m. to 1 in.	10	..
48	1913	Sayward District, Sketch-map of	3 m. to 1 in.	10	..
*33	1912	Yale District and Portion of Adjacent Districts	8 m. to 1 in.	25	2 00
27	1912	Rupert and Coast Districts, Portions of	3 m. to 1 in.	25	2 00
22	1912	Northern Interior	17.75 m. to 1 in.	25	2 00
*20	1912	New Westminster and Vancouver Island, Portions of	3 m. to 1 in.	25	2 00
18	1912	British Columbia, South-west Portion of. (Second iss.)	12 m. to 1 in.	25	2 00
*11	1911	Kootenay District, East and West, showing Mining Divs.	8 m. to 1 in.	25	2 00
9	1907	Northern Interior. (A. G. Morice.)	10 m. to 1 in.	10	50
7	1903	British Columbia. In two sheets	20 m. to 1 in.	..	5 00
5	1898	Kootenay District, East, Triangulation Survey of	6,000 ft. to 1 in.	10	50
4	1897	Osoyoos District, Portion of	2½ m. to 1 in.	10	50
3	1897	Kootenay District, West Division, and Part of Lillooet, Yale, etc., Mining Recording Divisions	8 m. to 1 in.	10	50
2	1896	Kootenay District, West, Portion of	1 m. to 1 in.	10	50
1	1895	Vancouver Island, West Coast, Portion of; Clayoquot District	½ m. to 1 in.	10	50

‡ In course of printing. * Out of print. † In course of compilation.

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

TABLE G.—DEPARTMENTAL REFERENCE MAPS.

Price-list of Blue-prints.

1.	West Coast, V.I. (Barclay Sound, Southerly)	Scale, 1 inch to 1 mile	$1 50
1A.	West Coast, V.I. (Barclay Sound, Northerly)	,, ,, ,,	1 00
2.	Nootka District	,, ,, ,,	1 00
2A.	Rupert District (South Portion)	,, ,, ,,	1 00
3.	Kingcome and Seymour Inlets	,, ,, ,,	1 50
3A.	Rupert District (North-west Portion)	,, ,, ,,	1 00
3B.	Johnstone Straits	,, ,, ,,	1 00
4.	Knight and Bute Inlets	,, ,, ,,	2 00
4A.	Sayward District	,, ,, ,,	1 00
5.	Texada Island and West Portion N.W.D.	,, ,, ,,	1 00
5A.	Jervis Inlet	,, ,, ,,	1 00
5B.	Howe Sound and Squamish Valley	,, ,, ,,	1 00
5C.	Harrison Lake	,, ,, ,,	1 00
6A.	Nicola	,, ,, ,,	1 00
6B.	Princeton	,, ,, ,,	1 00
6C.	Ashnola River	,, ,, ,,	1 00
7A.	Kettle River	,, ,, ,,	1 00
7B.	South Half of Okanagan Lake to Boundary-line	,, ,, ,,	1 50
7C.	North Half of Okanagan Lake	,, ,, ,,	1 00
7D.	Lumby and Vicinity	,, ,, ,,	1 00
11.	Murtle Lake	,, ,, ,,	1 00
11A.	North Thompson	,, ,, ,,	1 50
12.	Ranges 2 and 3, Coast District	Scale, ½ inch to 1 mile	1 50
12A.	Bella Coola Valley	Scale, 1 inch to 1 mile	1 50
14.	Ranges 4 and 5, Coast District	,, ,, ,,	2 00
14A.	Portion of Skeena River and Kitsumgallum	,, ,, ,,	2 00
14B.	Gardner Canal and Vicinity	Scale, ½ inch to 1 mile	1 00
15.	Moresby Island, Northern Portion	Scale, 1 inch to 1 mile	1 00
15A.	,, Southern ,,	Scale, ½ inch to 1 mile	1 00
16.	Graham Island, N.E. Portion	Scale, 1 inch to 1 mile	1 00
16A.	,, S.E. ,,	,, ,, ,,	1 00
16B.	,, W. ,,	,, ,, ,,	1 00
17.	Portland Canal	,, ,, ,,	2 00
17A.	Skeena River from Lorne Creek to Kispiox River	,, ,, ,,	1 50
17B.	Nass and Kitwancool	,, ,, ,,	1 50
18A.	Moose Lake and South Fork of Fraser River	,, ,, ,,	1 50
20.	Moricetown and Bulkley River	,, ,, ,,	1 00
21A.	Fraser Lake and Nechako Townships	,, ,, ,,	1 00
21B.	Francois Lake and Oosta Lake	,, ,, ,,	1 50
21C.	Douglas Channel	,, ,, ,,	2 00
22.	South Fork of Fraser River	,, ,, ,,	2 00
22A.	Fort George and Vicinity	,, ,, ,,	1 50
22B.	Portion of Nechako River and Cluculz Lake	,, ,, ,,	1 50
22C.	Blackwater and Mud River	,, ,, ,,	1 50
22D.	Fraser River, Vicinity of Quesnel	,, ,, ,,	1 50
22E.	South Fork of Fraser River	,, ,, ,,	1 50
23.	Quesnel Lake (East Arm)	,, ,, ,,	2 00
23A.	150-Mile House, Barkerville and Quesnel Lake	,, ,, ,,	2 00
24A.	Anderson and Seton Lakes, Lillooet	,, ,, ,,	2 00
24B.	Fraser River, Lillooet District	,, ,, ,,	2 00
25.	Portion of Ranges 2 and 3, Coast District	,, ,, ,,	1 00
26.	Porcher and Adjacent Islands	,, ,, ,,	1 00
27A.	Fraser River (Alexandria, Southerly)	,, ,, ,,	2 00
27B.	Lac La Hache and Northern Lillooet	,, ,, ,,	1 50
28.	North Part of Babine Lake	Scale, ½ inch to 1 mile	2 00
28A.	Stuart and Babine Lakes	Scale, 1 inch to 1 mile	2 00
29.	Chilcotin, West 124th Mer.	,, ,, ,,	2 00
29A.	Anaham and Abuntlet Lake	,, ,, ,,	2 00
29B.	Nazko and Chilcotin Rivers	,, ,, ,,	2 00
30.	Bonaparte River and Canim Lake	,, ,, ,,	1 00
31.	Bulkley Valley	,, ,, ,,	2 00
32A.	Tatlayoko Lake	,, ,, ,,	2 00
32B.	Head of Bute and Knight Inlets	,, ,, ,,	2 00
34.	Lot 4593, West Portion	Scale, 2 inches to 1 mile	1 00
34A.	Lot 4593, East Portion	,, ,, ,,	1 00
35.	Islands, S.E. of Vancouver Island	Scale, 1 inch to 1 mile	1 00
38A.	Groundhog Coal Area, East of Meridian	,, ,, ,,	1 50

TABLE G.—DEPARTMENTAL REFERENCE MAPS—*Concluded.*

Price-list of Blue-prints—Concluded.

38B.	Groundhog Coal Area, West of Meridian	Scale, 1 inch to 1 mile	$1 50
38C.	Upper Nass River	" " "	1 50
39.	Euchiniko Lake	" " "	1 00
40.	Tetachuck and Euchu Lakes	" " "	2 00
42.	Big Bend, Kootenay District	" " "	1 50
42A.	Adams Lake and River	" " "	1 50
42B.	Canoe River	" " "	1 50
42C.	Cedar Creek, Columbia River	" " "	1 00
43.	Peace River, South of Dominion Government Reserve	" " "	1 00
45.	S.E. Foreshore of Vancouver Island	" " "	1 00
46.	Saanich District and Islands	" " "	1 00
47.	Peace River, West of Dominion Government Reserve	" " "	2 00
48.	Lake McLeod	" " "	2 00
49.	Pine River, Peace River District	" " "	1 50
50.	Parsnip and Peace Rivers	" " "	1 50
51.	Finlay River	" " "	1 50
52.	Atlin Lake	Scale, ½ inch to 1 mile	1 00
18-9S.	Rossland and Vicinity	Scale, 1 inch to 1 mile	1 00
17-9S.	Nelson and Creston Vicinity	" " "	1 00
16-9S.	Moyie River	" " "	1 00
15-9S.	Elko Vicinity	" " "	1 00
15-9N.	Fernie and Crow's Nest Vicinity	" " "	1 00
16-9N.	Cranbrook and Kootenay River	" " "	1 00
17-9N.	Kaslo and Kootenay Lake	" " "	1 00
18-9N.	Edgewood and Lower Arrow Lake	" " "	1 00
15-0.	Elk and White Rivers	" " "	1 00
21-23.	Duncan Lake and Columbia Lake	" " "	1 50
18-20.	Nakusp and Vicinity	" " "	1 50
27-29.	Columbia River, Wilmer, and Spillimacheen	" " "	1 50
30-32.	Trout Lake and Upper Arrow Lake	" " "	1 50

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, are now on sale.

FRANCOIS-OOTSA LAKE DISTRICT.

BY A. W. HARVEY.

VICTORIA, B.C., October 19th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—In accordance with your instructions of last July, I proceeded to Ootsa Lake and surveyed the area left vacant in the vicinity of Skins Lake, containing approximately fifteen sections. The country lying between Ootsa Lake and Skins Lake is very rough and rocky, Lots 2538, 2545, and 2546 being worthless. The eight sections lying to the west of Sections 2538 and 2543 contain a considerable quantity of good land, the country being rolling and timbered lightly with small poplar, pine, and spruce. The soil is similar over the whole area, being a light clay loam, gravelly on the ridges. There are numerous small lakes and swamps.

To the north along Cheslatta Creek I completed the survey of the sections having this creek for the south boundary. This stream, after leaving Skins Lake, runs through two small lakes and is from 15 to 50 links wide, in a well-defined channel, and contains running water throughout the year. I have used this stream as the northern boundary of Lots 2542 and 2548.

On the completion of this work I moved to the west end of Uncha Lake, where I surveyed nine and a half sections. The land along the stream connecting Takysie and Uncha Lakes is good and comprises numerous small meadows and willow-swamps. The uplands are lightly timbered with pine, spruce, and poplar, and the soil is a clay loam, with a gravelly subsoil. Lots 2563, 2564, and 2565 are somewhat rough and broken. After the completion of this work I returned to Burns Lake, where I arrived on September 11th.

The Francois-Ootsa Lake District contains more good, open farming land than any other portion of Northern British Columbia. The country is broken by numerous ranges of hills varying in height from 300 to 1,000 feet above the elevation of the larger lakes. The southern slopes of all these hills are practically devoid of trees and covered with a heavy growth of grass, peavine, and fireweed, reaching a height in places of over 6 feet, interspersed with clumps of willow-bush and poplar. The northern slopes are generally moss-covered and thickly timbered with pine and spruce. Balsam also is found on the higher hills.

The soil in these ridges is chiefly a light clay loam, dry and gravelly, covered on the southern slopes by a layer of black loam varying in depth from a couple of inches to over a foot, and formed by the annual decay of the rank vegetation.

The valleys between these ridges contain a very large quantity of excellent land. Hay meadows are very numerous, also large willow-swamps, most of which are easily drained and brought under cultivation. The soil in the bottoms is a heavy clay loam with a covering of vegetable mould. On the benches the soil is lighter, with a mixture of sand, and the timber consists of small poplar, pine, and spruce from 3 to 15 inches in diameter.

The climate is generally dryer and warmer than the average of Northern British Columbia, the summer frosts being less frequent and severe than in other districts and the rainfall in the summer very light.

There are numerous settlers in the country, most of whom are located along the north shores of Francois and Ootsa Lakes, and along the wagon-road from Burns Lake to Ootsa, which has been nearly completed this summer.

Vegetables, such as potatoes, turnips, carrots, etc., can be grown to perfection in this district and yield very heavy crops. Very few attempts have been made to grow fruit, but berries and the hardier fruits should be raised successfully. The winters are long, but not so severe as in the Bulkley and Nechako Districts. Snow lies on the ground from four to five months in the year and averages about a foot in depth. The lakes are frozen for about three and a half to four months.

Lakes are more numerous in this district than in any other part of British Columbia, and fish are very abundant. In Francois Lake the trout, both grey and rainbow, grow to a very large size, the grey trout especially being taken occasionally as large as 40 lb. In Ootsa Lake the grey trout is not found, and the rainbow are much smaller than in Francois Lake. Most of the small lakes are also full of fish, trout, whitefish, suckers, and a coarse species of chub which are very poor eating.

Game is not very abundant, though deer are fairly plentiful, and moose and caribou are occasionally seen. Grouse and rabbits are numerous, but not as abundant as in other districts.

The chief difficulties of the new settlers in the country are lack of transportation facilities and a market for their produce. The only road through the district is that from Burns Lake to Ootsa, and the suitable land on this road and adjacent to the large lakes has all been taken up.

The chief crop grown in the country is potatoes, value about 1 cent a pound, and it does not pay to haul these to the railroad. The future of the district depends on the cattle industry, the country being essentially adapted to stock-raising. The range on the hills is very extensive and the snowfall light. With greater transportation facilities and a better market, the Francois-Ootsa District should have a great future.

I have, etc.,
A. W. HARVEY, B.C.L.S.

VICINITY OF FRASER LAKE.

BY F. BUTTERFIELD.

November 30th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to submit the following general report on Fraser Lake District:—

The old surveys in this district, owing to the physical nature of the country, were often disconnected; fractions were thus created, and in many instances excellent lands neglected. Such lands as these have become valuable of recent years, and many settlers have found vacant unsurveyed land and good homes in localities where the majority have passed without examination.

The survey of such pieces comprised a considerable portion of the past season's work, and I believe I am correct in stating that at the close of the season all pre-emptions immediately south and west of Fraser Lake and east of Savory, in the Endako Valley, were surveyed. In addition to these, considerable land has been surveyed in advance of settlement.

The survey of land ahead of settlement in this district, while highly satisfactory when completed, requires an excellent knowledge of the country to carry out. Even with such knowledge, unless, by chance, outside information is obtained, a stray tract of land might easily escape notice. Rocky lands and agricultural pieces are freely interspersed, and I would advise the intending settler to bear this in mind when in search of a suitable location.

The influx of settlers during the past year has been very satisfactory. The sudden realization of the country's possibilities actuated by the comparatively recent advent of the Grand Trunk Pacific Railway has raised the restriction which the settler placed on the extent of his tilled land, and such an advance has been made in quantity of produce in 1915 over former years that great difficulty has been experienced in finding sufficiently large markets. Surplus and unmarketable produce, however, is now being used in many instances to feed recently imported stock, and the farmer is neither suffering loss nor has he any regrets. At the close of the season potatoes were selling at 1 cent and turnips at ½ cent per pound.

A number of farmers and settlers are experimenting with fruits, and while it will be some years before the large fruit-trees are yielding, there seems absolutely no reason why an immediate result of a satisfactory nature should not be attained with the smaller varieties. To substantiate the belief that it is a small-fruit country, I would mention that wild fruits have during the season been very prolific. Black currants more particularly came under notice, and for weeks there was hardly a day that black currants in some form or another did not find a place on the camp table. Wild strawberries were also very plentiful, but were unmolested by us, as the currants were more easily picked.

Yearly the residents of the district learn more of the adaptabilities of the local soil and climate, and last summer, on the shores of Fraser Lake, tomatoes of good quality matured and ripened in the open. This, I believe, was the first attempt at growing tomatoes in this district, and no doubt such success will be an incentive to their more general growth in the future.

Some of the older settlers are breeding cattle, and expect to reap substantial remuneration for their efforts shortly. The war has affected the development of this part of the Province,

in common with others, and many of the better-known faces of the Northern Interior are away on active service. However, development continues, and settlement in a slow, steady way promises a prosperous day when the world's business once more becomes normal.

CHARACTERISTICS, ETC.

Fraser Lake is situated at the east end of Endako Valley, and is fed by the combined waters of the Endako and Stella Rivers. It is drained by the Nautley River, which carries its overflow to the Nechako River, only one mile distant. At this point the Nechako River makes its big bend, changing direction from about N. 40° W. to east. The Nautley is navigable by launches only on high water, and at low water it is only by dint of perseverance and much hauling over stones that any craft may be taken from the Nechako River to Fraser Lake. The lake is about 2,250 feet in altitude and is encompassed by low hills. On the north side these are more prominent, but on the south they do not rise so high, and while the country is much broken and very irregular, the relative amount of rock is comparatively small. The timber consists chiefly of poplar and jack-pine, the latter found occasionally growing amongst the former.

The theory that jack-pine flourishes only on useless and unfertile soil is being exploded. Jack-pine does grow in places where it is hard to credit the existence of any nourishment, but it does not necessarily follow that a lack of sustenance is requisite for its growth. In order to dispel the idea that jack-pine land is invariably useless, I would emphatically state that I have seen equally good crops taken from former jack-pine land as from neighbouring poplar. Jack-pine needs very little moisture, and sometimes, in consequence, grows profusely in localities where other trees cannot exist. It has been said that the soil in which jack-pine has grown for some years is intensely resinous and is thus rendered unsuitable for herbage. This may be, but nothing has ever come under my observation to lead me to any decision on this point.

The Endako Valley proper is only about one mile in width in some places, but, nevertheless, possibly receives more attention from incoming settlers than any other portion of the Fraser Lake District. The soil of this valley is rich in the bottom lands, but inclined to rock on the higher levels. As a fair proportion of the season's work was performed in this valley, I propose going more into detail later.

Throughout the district the beaver has contributed to the formation of meadows by damming the waterways at the narrow points, and though many meadows so formed are wet, they can, without exception, be drained and brought under cultivation.

Light timber is general, rendering slashing, clearing, and road-building as simple and inexpensive as possible.

The past summer experienced absolutely no frost, and undoubtedly the reduction of the wet, moss-covered bottoms, sometimes, and to my mind incorrectly, termed "muskegs" by the farmers, has materially assisted in the remedy of this evil.

ACCESSIBILITY.

The Grand Trunk Pacific Railway skirts the south shore of Fraser Lake, coming from the west by way of the Bulkley, and from the east by the Fraser and Nechako Valleys. Fraser Lake is reached by train in about fifteen hours from Prince Rupert and four hours from Fort George. Numerous wagon-roads and trails traversing the districts in all directions give ready access to outlying points. New trails and roads are in course of construction, and others, I understand, under consideration, which will further facilitate transportation by providing shorter routes to the railway.

FARMING AND AGRICULTURE.

No class of farming or agriculture has been pursued sufficiently to prove its limitations, but judging from the crops of the past two years the vicinity of Fraser Lake compares favourably with other cultivated districts of the Northern Interior. Prevalent opinion has favoured the growing of garden-truck as the most remunerative branch of agriculture, but a superabundance of vegetables on this account, together with bumper crops, recently threatened a glut of the present markets.

While cattle-raising is still in its infancy, its success has been established, but the presence of cattle, horses, pigs, chickens, etc., together with oats and hay sufficient for winter consump-

tion, suggests mixed farming as the ultimate aim of the local farmer. The existence of coyotes probably discourages sheep-farming, and though some residents are seriously considering sheep as an adjunct to their mixed farms, no attempt has been made to test their success. As a specialty, the preparation of stall-fed cattle for Coast markets would, in consideration of the excellent location, the luxuriant growth of herbage for stock, and the amount of excellent winter feed which may be cheaply grown by the farmer, appear to be the most lucrative. It is a general local belief that ultimately the district will hold a prominent place in the beef-producing districts of Canada.

Oats are being grown with great success, and from actual weights and measurements taken this year an individual crop of oats was found to average slightly in excess of 100 bushels to the acre. The potato-crop is usually highly satisfactory, and the past year's is no exception, some of the yield even weighing over 3 lb. each. A short list of prices of produce, etc., is appended, and it is hoped may render the foregoing more comprehensive.

Soil.

Disintegrated clay has, by years of nature's working, been deposited over a considerable area of the district, ultimately producing by association with sand, gravel, and other ingredients a sandy soil. This varies greatly, occasionally presenting a fine silt appearance which suggests the entire absence of sand, and again showing a decided preponderance of gravel. The latter soil is found usually on the higher levels, where the absence of moisture is also manifest. Vegetable mould, red and black loams are present along the river-bottoms and in most of the lower altitudes, except where summer fires have burnt deep into the surface soil. The fertility of the lower lands is unquestioned, and the luxuriant growth of peavine or vetches, fireweed, etc., gives ample evidence.

Climate.

During the summer careful readings were regularly taken each morning of the maximum and minimum temperatures, and the precipitation during the preceding twenty-four hours. A table based on these observations is appended. It should be stated here that for portions of the months of July and August the thermometer was stationed on the edge of a moist meadow of some 70 acres in extent, a decidedly cold place, resulting in temperature-readings several degrees lower than the average temperature elsewhere. The appended readings deal only with the past summer months, and as no winter records are at hand the tabulation must remain incomplete. The respective localities of observations are shown, and the months are broken the better to distinguish the climatic conditions at each point. The best information the incoming settler may obtain for determining the suitability of the climate may be gleaned from the foregoing reference to the district's farming adaptabilities.

It is worthy of note that during the summer months no single instance of frost was recorded, except in such places as were locally affected by the near existence of wet meadows.

Markets.

Under normal conditions—that is, with the average amount of road-construction, railway improvements, etc., in progress—the vegetable production far exceeds the need of the local markets. The fluctuations of these markets are materially enhanced by outside labour being occasionally imported for the purpose of hastening railway-work, but never do the meat and dairy markets ebb so low that their requirements can be met by local supplies. The importation of beef, eggs, butter, etc., is regular, and ample room is left to warrant much development and increase in stock on the part of the farmer. Prince Rupert and Prince George, being comparatively large towns, receive their farm produce by train, and in the competition for their desirable patronage the district surrounding Fraser Lake is by merit destined to become noteworthy.

Local Employment.

New arrivals are often dependent on this phase of the situation to give them a "start." Dearth of employment was general during the past summer months, but this unsatisfactory state of affairs is quite exceptional and not in the least peculiar to the district. The war is easily traced to be the cause, and no doubt the same trouble has been experienced in most

countries of mixed agricultural tendencies the Dominion over. Lack of employment, however, has never been so conspicuous or serious as to leave hunger in its trail, and the new pre-emptor can be assured that he can always find an older-established farmer who, in return for labour, and failing all else, will give him at least a living until something more substantial presents itself. The wheat-crop proved the safety-valve last summer, and large numbers of men left for the Prairie Provinces to earn themselves a grub-stake. It is the usual thing for farmers to aid one another in their more arduous tasks. In this way fewer expenses are incurred and all work in accord and unison. It is impossible to mention the many sources of employment which await the needy settler's investigation. Demand for manual labour is usually sufficient for all who require it, while frequently stores, railway offices, etc., require additional help, which can often be fitted in and arranged to suit the settler. In addition, a resourceful man can usually find a means in this new country of earning money sufficient for his immediate needs without being dependent on what may be offered him.

ABORIGINES.

Much has been said and written pertaining to the Northern Interior natives, and authentic information, valuable to the student of the Province's early history, has been presented from time to time. From these writings and present-day observations we note a remarkable change in their daily lives, the more remarkable as the last few years appear to have evidenced practically the entire change. Indeed, during the past twelve months, the Indian has surpassed himself, no doubt to a large extent through necessity, but probably influenced also by the sound advice of the Indian Agent.

As far back as history takes us, the Indian has been largely dependent on fish, and had he not displayed a sudden increase of energy and interest in agriculture, the recent failure of salmon would have caused much greater distress than it has done. The Indian has always delighted in the possession of horses and carries his delight to a ridiculous extreme. Often "hard-up," he still retains at least one horse, and only in desperation will he condescend to part with any. The cayuses are invariably inferior beasts when owned by the Indian, but to him a horse is apparently indispensable. To my knowledge, the local Indian Agent has for years attempted to demonstrate this folly, and advised the acquisition of cattle in place of superfluous horses. At last it would appear some Indians are acting upon this good advice.

On one Indian reserve east of Fraser Lake may now be found over fifty head of cattle; Nautley Indian Reserve boasts six; while Stella Quo has about thirty to its credit, most of which are under the ownership of a single individual. In addition to cattle, great progress has taken place in agriculture, and in place of a few small scattered garden-plots, with contents stunted for lack of proper attention, now large tracts of garden produce and cereals are cultivated and receive comparative care.

In illustration, within the past year the Stony Creek Indian Reserve raised 230 acres of oats and 30 acres of garden produce; Nautley Indian Reserve grew about 10 acres of oats and the same amount of garden produce; while the Indians of Stella Quo cultivated in all about 35 acres, 15 of which were in oats, 15 in produce, and about 5 acres in timothy-hay. Oats and potatoes did particularly well on all the Indian reserves, but some of the garden produce was not a success.

Such oats as were not cut green for feed ripened nicely, though the number of black oats would suggest the advisability of a change of seed. As before stated, probably poor fish-catches induced the Indians to devote more time and attention to agriculture. Some never caught a salmon the whole season through, and those who were luckier or more skilful obtained very few. At the close of the survey season, however, the larders were being filled with venison to compensate for fish-failures, and many deer were falling victims to the native hunters' rifles.

Some of the women are skilled in the use of the needle, and while their taste in design is often crude and decidedly Oriental, the patience and perseverance they employ excites admiration. Civilization is teaching them much useful knowledge, but while it is doing this, they are surely becoming less adept in their former crafts. Amongst other things, the arrangement of beads and mingling of silks in that peculiar manner is being forgotten, and patience is becoming less of a trait in their character. Nevertheless, a few women are yet to be found in Fraser Lake District who can display true Indian skill in both silk and bead arts.

FISH AND GAME.

The country is endowed with a fair quota of fish and game, though the hunting and sometimes the fishing usually involves considerable labour. Practically every stream is a trout-stream, and every lake of fair size has its whitefish. Salmon are usually plentiful during the season in both lake and stream, but, as before stated, the past proved exceptional. For trout I would especially mention the falls in the Stella Quo, where good catches are made annually with rod and fly. It appears any bright-coloured fly of liberal dimensions is good, but a small fly is less successful. Deer are plentiful, more so this year than usual, but grouse of all species are now very scarce in the settled vicinities. Deer are difficult to locate while the ground is bare, as they are so scattered and do not congregate or habitate any particular spots. They wander through a large expanse of country, and therefore little attempt is made to hunt them until the first fall of snow, when the expert hunter tracks them to a stand. In the outlying portions of the district grouse are still in fair numbers, but more easily affrighted than before the days of railway-construction. Chief amongst the fur-bearing animals is the beaver, which has done so much towards the preparation and formation of land. They are being killed out expeditiously by the settler draining land, who finds them a pest, as they rebuild with such rapidity the dams which he is endeavouring to destroy.

SOUTH OF FRASER LAKE-CHESLATTA TRAIL.

That portion of the district south of Fraser Lake which more particularly came under notice is within six miles of the lake-shore and, with the exception of about 1,000 acres, west of the Old Cheslatta Trail. This trail leaves the south shore wagon-road about six miles west of Fort Fraser and, continuing westerly, skirts the shore of Dry William Lake; then, turning southerly, passes Klez Lake on the west shore.

Old lines of prior surveys for the most part defined the limits of survey, while the foot-hills of the Nithi Divide rendered it inadvisable to continue the system farther south. While surveying the westerly portion of this tract camp was located about one mile south of Mud Lake on the edge of an extensive meadow. This meadow, indirectly formed through the activities of beaver, and only a few years ago perpetually under water, has now been drained and transformed into one of the finest hay meadows of the district. Timothy grass (*Phleum pratense*) has been sown, and is quickly choking the coarse, native swamp-grass out of existence. Another large meadow, still in its native state, is situated about half a mile east of here, and other smaller ones exist in the neighbourhood. The surrounding country is clothed in spruce, poplar, and jack-pine, the spruce being particularly heavy in the close proximity of the meadows. In the poplar and spruce localities the soil is excellent, but almost all this land is now alienated. The vacant lands south of Dry William Lake and west of the Cheslatta Trail as far south as Chowsunkut Lake are mostly covered with poplar. The trail itself follows high gravelly and rocky ridges, but leaving the trail westerly the soil improves, ultimately consisting of black loam and light vegetable mould, while rock only occasionally appears on the surface. The whole of this tract is entirely unsettled, and is seldom traversed except by the few Indians who trap through the district. Filed with the field-notes is a short description of each separate parcel surveyed.

STELLACO AND VICINITY.

Stellaco is situated about one mile west of the Indian reserve of the same name at the west end of Fraser Lake. In the days of railway-construction it was one of the busiest places along the line, but is now just the farming community it was in former days. Stellaco lacks a railway-station, but boasts both a post-office and a school. The settlers are extremely industrious, and their industry is vouched for by the magnificent crops of vegetables. Almost without exception the residents are "old-timers" who took up land years before railway communication, when the Hudson's Bay Fort, near the present Fort Fraser (eighteen miles distant by trail), was their nearest store and neighbour. No speculative reason prompted these men into the acquisition of the land, and though their holdings through years of cultivation and through the asset of railway facilities are now very valuable, they have not been sold, but rather the owners have increased the scale of their agricultural activities and set a fine example to the countryside.

There are no stores at Stellaco, all necessary provisions, etc., being purchased at Endako, which is about three miles and a half distant. Stellaco would not be worthy of mention were it not for the fact that its residents to-day were its settlers and agriculturists before Endako or a railway divisional point was thought of.

A few quarter-sections of land open to the settler for pre-emption in this vicinity are bounded on the south by the Stellaco River. The falls of the river, while being noted for trout, should prove an unending source, should local industry ever require power.

ENDAKO AND SAVORY.

Endako is a divisional point of the Grand Trunk Pacific Railway, and as such has attracted much attention from incoming settlers. The valley of the Endako is very narrow and does not permit extensive settlement, but, nevertheless, vacant lands, and strangely some of the best, do exist, more particularly in the vicinity of Savory. Savory is the first flag-station west of Endako and is distant about seven miles, has no population, and consists of the station-house only. A few pre-emptors residing within a few miles distance utilize the station when incoming freight arrives.

The land hereabouts apparently has been little explored by the land-seeker, as excellent land, possibly the best in the country, may be found within two miles of this station and around Savory Lake and Loch Garry still lying idle. Willow bottoms, meadows, and poplar slopes constitute a sufficiently complete description to obviate the necessity of exemplification of the desirability of these lots. To convey a more adequate impression of the excellencies of some of this district, I might say that one individual settler has slashed 70 acres since obtaining his pre-emption record in June, 1913. The majority of this is burned and a fair proportion of it brought under barley, oats, and vegetables, all of which have been very successful.

East of Savory little unalienated land of agricultural value remains, though an occasional isolated pre-emption, as has been before explained, might be found which has escaped previous notice.

PRICES OF PRODUCE, ETC.

Wheat, $1.25 per bushel; oats, 1½ to 2 cents per pound; oat-hay, $25 per ton; oat-straw, $7 per ton; hay (timothy), $20 per ton; hay (swamp), $10 per ton; potatoes 1 to 2 cents per pound; turnips, ½ to 1½ cents per pound; cabbages and beets, 3 to 4 cents per pound; onions, 5 cents per pound; beef, 20 to 25 cents per pound; mutton, 25 cents per pound; milk, 5 cents per pint; eggs (local), 50 to 60 cents per dozen; eggs (imported), 35 to 40 cents per dozen; butter (local), practically unobtainable; butter (imported), 45 cents per pound; groceries, add 1½ cents per pound to Coast prices.

TEMPERATURES AND PRECIPITATION.

1915 (Month).	Mean High Temperature.	Mean Low Temperature.	Rainfall.	Locality of Observation.
	Degrees.	Degrees.	Inches.	
July 6th to 25th (20 days)	73.3	44.3	1.275	At Stellaco, three miles and a half east of Endako.
July 26th to 31st (6 days)	82.9	45.3	...	Foote's meadow, about three miles south of Frasertown.
August 1st to 22nd (22 days)	81.5	39	0.375	
August 23rd to 29th (7 days)	80.4	38	...	Dry William Lake.
August 30th to 31st (2 days)	59.5	45	0.1	Klez Lake.
September 1st to 12th (12 days) ...	58.7	39.1	0.3	
September 13th to 30th (18 days) ..	60.8	31.6	0.25	Half a mile west of Endako.
October 1st to 2nd (2 days)	51.5	29	0.15	

I have, etc.,

F. BUTTERFIELD, B.C.L.S.

PRE-EMPTION RESERVE, SOUTH OF WILLOW RIVER BASIN, NORTH-EAST OF PRINCE GEORGE.

By A. H. Holland.

Vancouver, B.C., December 4th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—In accordance with instructions, I completed the survey of that portion of the agricultural lands held under reserve for pre-emption which lie about twenty miles north-east of Prince George, on the south side of the Willow River basin.

Leaving Prince George on July 2nd, we were able to take a wagon-load of supplies to within three miles of our work over the new wagon-road which was then under construction and has since been completed, running easterly from Prince George to the Willow River. Another wagon-road has also been started from a point about twelve miles east of Prince George, running northerly through the area surveyed this year to Willow River Station, on the Grand Trunk Pacific Railway, and this road, when completed, will give all this section easy access to a market.

From our first camp on the wagon-road we built during the season twelve miles of horse-trail, connecting up with the trail built by the Forest Branch on the south bank of the Willow River, and thence back through the country surveyed to the end of the new wagon-road being constructed to Willow River Station, enabling us to take supplies to our work from either the town of Willow River or Prince George, as required. There is also a good horse-trail running in easterly from the railroad at Shelly Station, so that the whole area is easily accessible to intending settlers.

The country is more or less heavily wooded with a growth of balsam, spruce, and some pine to 18 inches, which is of little commercial value and makes fairly heavy clearing, but the settlers could save some of the timber for railway-ties, for which there should be a constant if not heavy demand, and so lessen the cost of the clearing, which would otherwise run from $50 to $80 per acre.

This area would be classed as bench land, lying as it does from 300 to 500 feet above the Fraser River, and is practically level, though cut by the drainage of some small tributaries of the Willow River, and is all suitable for settlement save a few quarter-sections on the south, where there is a rocky outcrop, which is mineralized, and where during the past season several mineral claims were staked and some assessment-work done; though with what results I do not know.

The soil is clay or silt, with a subsoil of blue clay, and wherever cultivated has given excellent results to the settlers, whose gardens contained all kinds of root-crops. In one case, where oats were seeded, there was a splendid showing, indicating that the country is specially adapted for mixed farming.

There is abundant rainfall in the spring, and this year we had showery weather till the middle of July, followed by six weeks of extremely warm weather which averaged a minimum of 50 degrees and a maximum of 80 degrees, giving the best conditions for ripening the crop before the first frosts of the season, which this year came on September 9th; and then only of a few degrees, so that some root-crops were not raised until the last week of the month.

The majority of the settlers on the ground are making a good showing, slashing and clearing from 3 to 10 acres each, besides putting up good cabins, and the action of the Government this year in building roads and trails in this district will help the settlement wonderfully.

The game of the country is not abundant, seemingly being driven back by the railroad-construction of the last few years and by incoming settlers, but we saw many signs of moose and deer in the autumn of the year, and the small game, such as grouse and rabbits, are plentiful.

Living costs in this district are also much lower than they have been in my experience of the country for the last five years, as the settlers are no longer handicapped by having to pay enormous freights as in the past, there being none of this area more than eight miles from a station on the railroad.

I have, etc.,

Arthur H. Holland, B.C.L.S.

QUESNEL RIVER VALLEY, BEAVERMOUTH TO QUESNEL.

BY R. W. HAGGEN.

QUESNEL, B.C., October 5th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—The surveys made by me during the past season cover the lands lying along the west bank of the Quesnel River, between Beavermouth and the mouth of Slate Creek, and also lands suitable for settlement along the road in course of construction from Quesnel to Hydraulic, between Dragon Lake and Quesnel River. In addition to this, a tie was made along the Cariboo Road from the 13-Mile House to Cottonwood, where connection was made to an old tie from lots on Swift River. The ties made will enable various blocks of lots, some distance from the Fraser Valley, to be accurately shown on the departmental maps, while all lands suitable for settlement in the locality where I was employed are now surveyed.

The flats in the valley of the Quesnel are not wide, the average width being from 30 to 60 chains, but they contain some excellent farming land, the best of which is now held under pre-emption record. The soil in the valley is generally a loam of considerable depth, overlying a gravel subsoil. The climate is excellent, there being a heavier precipitation than in the Fraser Valley, rendering irrigation quite unnecessary, except for ensuring a good crop of hay. I saw good crops of grain and vegetables at different places along the valley.

Gerimi Gravel, the pioneer farmer of the valley, whose ranch is at Twenty-six-mile Creek, has several hundred sheep, and now cultivates some 50 acres of land on the home ranch, to which he adds new fields each year. He irrigates the hay-fields. Mr. Gravel assures me that the winter climate of the valley is so mild that horses and cattle can rustle on the range all winter; however, the range is very limited, insufficient to permit large herds of stock to be kept.

Originally the valley was wooded with a forest of cedar, but an old fire cleaned it out almost entirely, there being now only scattered patches of a few acres of cedar; old stumps and many windfalls are all that remains of the old forest. In many places the land is almost open, grassy, and capable of being brought under cultivation at a very low cost. In a few places, and especially on some of the hillsides, the brush is as dense as one would find in almost any part of the Province.

The hills on either side of the valley are very steep, broken, and covered with numerous windfalls and brush. A number of small creeks are found along the hillsides, but these sink in the gravel as soon as the flats are reached.

At the Sardine Flats, near Sardine Creek, is found the largest flat, it comprising some 750 acres of land which is fairly level and easy to clear; the value of this flat is mitigated by the poor quality of the soil over the greater portion of it.

In the valley proper seventeen parcels of land were surveyed; of these, six are held under pre-emption record, but the others are suitable for settlement and will undoubtedly be taken up when local conditions warrant an extension of the farming industry.

LAND NEAR SLATE CREEK.

Along and near the new road from Quesnel toward Hydraulic I surveyed six parcels in the pass to the north of Dragon Mountain. These lie near the head of Slate Creek. Five of these parcels are pre-empted already, and the sixth contains some good land. The best land is on a bench in the west half of Lot 9130. The soil is excellent, there are several springs, and the clearing would not cost more than $25 per acre. This land is about twelve miles distant from Quesnel.

13-MILE HOUSE TO COTTONWOOD.

There is no agricultural land along this portion of the Cariboo Road. Hay is cut at Fifteen-mile Lake. The land is quite high, hilly, and undulating, the vegetation consisting of a growth of jack-pine and spruce. At Cottonwood there is a large ranch owned by the John Boyd Estate. There are patches of good land in the Cottonwood Valley below here, and good

land on Swift River (the South Fork of the Cottonwood) above Coldspring. At Cottonwood, which is twenty-one miles from Quesnel, there are store and stopping-house, post and telegraph offices. At the 13-Mile House (Locke's) there is a telephone-office on the Government Telegraph Line.

Summary.

In all, during the eight weeks I was in the field, 3,320 acres of land were surveyed, which involved the running of 39 miles of line, and 18.6 miles of tie-lines to various lots were run.

Access.

The old French Road, which continues from Quesnel to Quesnel Forks, leaves the Cariboo Road at Kersley, fourteen miles south of Quesnel, crosses over the range dividing the Fraser and Quesnel Valleys at an elevation of about 3,500 feet, and enters the bench land along the Quesnel Valley some five miles below Beavermouth. It follows the Quesnel Valley for some distance, reaching Quesnel Forks by way of Bullion. The road is rough and hilly between the Quesnel Valley and Kersley, and is not popular with teamsters; consequently it is little used, freight for Quesnel Forks and the Keithley District being brought from the 150-Mile House via the road from Mountain House. A new road, which will eliminate the bad summit, is now under construction from Quesnel, following around the north end of Dragon Lake, through a low pass to the north of Dragon Mountain, entering the flats along the Quesnel River in Lot 8719. This is the present end of the road, construction to this point being completed in September of this season. Approximately seven miles of road has yet to be built before connection is made with the French Road. Horses can be taken along the valley between the roads, but there is no trail worthy of the name below Lot 4635.

Mining.

Since the early "sixties" the Quesnel Valley has proved excellent for mining, large quantities of gold being shipped at various times. Chiefly flour gold is now found. Several dredges have been built at different places along the valley, but have not been a success, though the Hall dredge worked for several years. I have heard that one dredge is still working at Seven-mile Creek, but do not know whether this is the case. However, a number of diggers work along the bars of the river each season, and get a considerable quantity of gold. Some white men have told me they can average $3 per day working with a rocker. In mining of this nature, as with other branches of the industry, luck plays a great role. Occasionally a digger strikes a good pocket, taking out a good many days' wages in a few hours. These cases are, however, exceptional.

The flour gold on these bars is brought to them each season by the freshets, presumably from pockets of gold in banks which cave in. The dirt put through the cradle is taken from a depth of only a few inches from the top of the bar. Considering the small amount of dirt that can be handled through the rocker in the course of a day, I do not consider it any exaggeration to say that the average yield of the ground worked is $1 per yard. On first thoughts it seems strange that dredges do not make huge profits working these bars. Unfortunately the flour gold is difficult to save where a high force of water is used; even the rockers are reputed to save only half the gold that goes into them. Then, again, while the digger works only the pay-dirt on a bar, the dredge has to shovel to a considerable depth in order to work itself ahead; having, in consequence, to handle a very large yardage from which no return can be derived.

A syndicate whose name is well known throughout even more than the mining world is starting investigations along the valley to ascertain whether or not it will prove a good investment to put in large dredges of a new design.

With the closing of other avenues of employment, a number of men have been mining this year; pre-emptors who could get very little other work, and had no market for the produce they raised, have made their grub-stake at mining. The companies working in the Barkerville District have also had a good season, and it is certain that the aggregate gold shipment from Cariboo will exceed that of any one of the past ten seasons. It is estimated to be double that of last year. New prospects, which give promise of developing into good mines, have been worked on the North Fork of the Cottonwood and on Willow River. A find, which caused

considerable excitement, was made near Swamp River, some thirty miles east of Barkerville, but, apart from the finding of a few nuggets and some coarse gold, no deposit of value was struck. The indications are that a good deposit exists in the locality, but it is difficult to prospect. It is far from improbable that a find may be made there in the early future.

MARKETS.

At the present time there is no market available for farm produce raised in the district. The local market is very limited and, until the Pacific Great Eastern Railway is completed, outside markets are inaccessible for anything except beef. On all the farms in the district there are large crops in stack, while there is no immediate prospect of selling them.

RECRUITING.

A number of the pre-emptors in the district, as well as many others, have answered the call to arms; the number enlisting from the new Cariboo Electoral District is nearly 200. In proportion to population this exceeds 15 per cent. of the total, and is about 30 per cent. of the number of names on the voters' list.

GAME.

In the Quesnel Valley there is a fair number of black bear, deer, and grouse. The Beaver River, which enters the Quesnel at Beavermouth, is a renowned trout-stream.

I have, etc.,

RUPERT W. HAGGEN, B.C.L.S., D.L.S.

LILLOOET DISTRICT, BETWEEN 111-MILE CREEK AND 52ND PARALLEL.

BY A. S. COTTON.

NEW WESTMINSTER, B.C., November 30th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—In accordance with instructions dated August 6th to survey pre-emptions and examine that portion of the Lillooet District lying between 111-Mile Creek and the 52nd parallel, I proceeded to the 115-Mile House and found everybody busy harvesting, and could not get any men to work until that was over, which was not until September 1st.

The building of the Grand Trunk Pacific Railroad has made a wonderful change all along the old Cariboo Road. A few years ago all the freight was hauled over this well-known route from Ashcroft, and countless freight-wagons were seen going to and fro. To-day it is vastly different, as all now goes by rail to Prince George. The completion of the Pacific Great Eastern will still more reduce the traffic, thus compelling the ranchers to turn their attention to farming, and judging from what I saw this season, they should not have any fear. All those who tilled their land were well repaid, as there was a banner crop from one end of the road to the other.

In the area examined and surveyed by me this season there is room for quite a number of settlers, provided they do not want open meadow land, which was the custom a short time back. The bush land will amply repay the clearing. The object of my visit to this section of the district was to obtain information regarding the country lying south of the 52nd parallel and Timothy Mountain Lake, and I found that there are about thirty square miles of grazing land and on which a considerable amount of hay could be cut. It is rather too high for general farming, but is well suited for summer range.

Timothy Mountain Lake is a beautiful sheet of water four miles long and half a mile wide, the north side of which is some of the finest land in the Province, easily cleaned and well worth taking up. It is only eight miles from the 115-Mile House and a fairly good wagon-road leads to it. The same can be said of a strip on the north side of Green Lake, while the greater portion lying between Timothy Lake and Chub Lake is a little more rolling and is well worth taking up. The soil is excellent and the timber is not dense. Good feed is to be found everywhere.

Lying to the east of Railroad Lake is a good-sized flat of good soil. At present it is covered with second-growth pine. The old Horsefly Road runs through it, making it accessible.

Little Timothy Mountain is a landmark. It can be seen from miles around. It is of volcanic origin and abounds in magnetic iron. It stands out in bold relief.

Of the game, I cannot say much, as very little was seen, but on every stream beaver are numerous.

A sketch-map showing the main topographical features accompanies this report.

I have, etc.,

A. S. COTTON, B.C.L.S.

EAST OF 83-MILE HOUSE, LILLOOET.

BY W. S. DREWRY.

November 28th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to report that, in accordance with instructions, a tract comprising some 15,000 acres has been subdivided to meet the requirements of advancing settlement. The area dealt with lies east of 83-Mile House on the Cariboo Road, joining lands surveyed by the undersigned in 1914 east of Horse Lake, and stretching north and east of Sheridan Lake to Bridge Lake. It is a comparatively regular plateau lying between North Bonaparte River on the south, embracing Upper Bridge Creek Valley on the north, and extending westerly from the mountains along the North Thompson River to the Pacific Great Eastern Railway, which follows, in part, the foot of its westerly slope.

The plateau is relieved by a few fir-crowned ridges which assist in watering the country from the increased precipitation of higher altitudes, and also afford valuable range for stock, since bunch and other succulent grasses, peavine, and lupine grow luxuriantly among the open timber.

The lava floor of the country is elevated along the westerly side of Bridge Lake, towards which it presents an escarpment rising some 300 or 400 feet above the water. This ridge is the only rock-exposure noted, and is worthless except for scenic effect. Being easily accessible and commanding a wide range of country, it might possibly be used as a look-out station in forest-protection work.

There are many lakes varying in size, the largest being Bridge and Sheridan Lakes, each some five miles long by three wide. The former has bold shores, contains several islands and shoals, and its water has a slightly peaty appearance.

SHERIDAN LAKE.

Sheridan Lake, draining into Bridge Creek, is an interesting as well as lovely sheet of water. There are no creeks of consequence flowing into it, and its apparent outlet near its north-west angle seldom shows a run of water. But the lake-water is very clear and pure and must come from deep-seated springs, its level being well maintained. This can hardly be the result of balance of inflow and evaporation, since the water would probably long ago have become unfit for use, it being ice-covered during the winter. Its eastern limit is only a few hundred feet from a creek flowing into Roe Lake, the surface of the creek having been ascertained to be 14.7 feet lower than that of Sheridan Lake. It is therefore possible that there is a strong seep or underground connection through the intervening ridge, although no indication of it was found.

BRIDGE CREEK.

Bridge Creek, coming from the mountains along the North Thompson River, enters Bridge Lake near the centre of its westerly side, and leaves at the north-west angle; enlarging into Lesser Fish Lake at a distance of about a quarter of a mile, forming a sheet of water about one mile east and west by half a mile wide.

The creek flows from its western extremity, following a circuitous course for some two miles, when it again enlarges into Roe Lake about one mile long and half a mile wide. From Roe Lake the stream flows northerly and westerly in a deep valley to Horse Lake, eventually discharging through Canim and Mahood Lakes into the North Thompson River.

No other creek of any importance was encountered, but there are numerous springs and brooks affording an excellent water-supply. Wells not exceeding 12 or 15 feet in depth yield good water, there being little or no alkali in the soil.

The deep valleys of North Bonaparte River and Bridge Creek serve not only in unwatering the country, but also appear to drain off the cold air, so that there seems to be a greater freedom from frost in the uplands than in the valleys. The phenomenon would appear to be explained by the heavier, colder air naturally seeking the gutters, leaving a warmer stratum above it, thus having a marked effect when the temperature approaches freezing-point.

ACCESSIBILITY.

The region is most easily reached at present by the Cariboo Road from Ashcroft to 70-Mile House, and thence by the North Bonaparte Road north-easterly some thirty-one miles, from which point a rough road leads northerly some six miles to Roe Lake, whence possible roads radiate to various points within the lands surveyed, connecting with a road cut out following Bridge Creek Valley to 100-Mile House on the Cariboo Road.

The completion of the Pacific Great Eastern Railway will, however, entirely alter the whole transportation problem, Roe Lake being only some eighteen or nineteen miles from the railway on the Horse Lake Summit.

An easily constructed road, crossing Bridge Creek about one mile and a half north of Roe Lake, and running almost directly west north of Sheridan Lake, passing through first-class country, would be free from steep hills or swamps, and connect with the road system begun in the Green and Horse Lake sections; making the best route to either 100-Mile or 70-Mile Houses on the Cariboo Road. Utilizing road already cut out, there remains only some eight miles to open this proposed road to the railway.

Some improvements in the local roads connecting with the above trunk road would begin a vein system, which will be required by the increasing settlement in the vicinity of Roe Lake, which has every indication of becoming an important and prosperous dairying and grazing community. The above remark applies not only to the Roe Lake locality, but also to an area embracing some 40,000 acres, which would also be served.

A school and Roe Lake Post-office have been established a short distance south-east of Roe Lake, the mail arriving weekly via 70-Mile House.

AGRICULTURAL POSSIBILITIES.

The soil generally is black loam varying from 4 to 18 inches in depth, with a clay subsoil on which in places is an ash-like deposit, possibly the result of the destruction by fire of the great fir forest which covered the country perhaps over a century ago. The variety and luxuriance of the vegetation amply proves the fertility of the soil, and also bears testimony to the sufficiency of precipitation. During the early part of last summer there was too much moisture, so that both grains and grasses grew so rankly as to be unable to sustain themselves erect. In many places wild grass and peavine were found standing from 3 to 4 feet high, which growth was not confined to the valleys alone, but was found also on the ridges, although generally to a somewhat lesser extent.

The productivity of the soil and suitability to farming purposes is not a matter of conjecture, but an accomplished fact. At different points fine crops of timothy, wheat, oats, barley, and rye were noted. Root-crops of turnips, beets, and carrots were very successful; several turnips weighed averaging above 5 lb. each. Clover of different varieties has been tried and appears to do very well. Mr. McDonald, of Lac Des Roches, reported having a good crop of alfalfa; but, so far as informed, he is the only settler in the district who has tried to grow that fodder. The gardens visited were somewhat surprising, both in variety and excellence of product, embracing potatoes, onions, carrots, beets, peas, lettuce, radishes, cabbage, cauliflower, rhubarb, etc.; in fact, almost everything which could be expected to grow at that altitude.

Some of the garden-tracts have been planted for the first time; but others have been cultivated for several years, the owners reporting that as yet they have had no failure from frost or lack of precipitation. Particularly the lettuce grown was of surpassing crispness and delicacy, and it is thought that celery of similar quality could be produced.

On the places of Mr. Holland, east of Roe Lake, and Mr. Smith, at the outlet of Bridge Lake, apple-trees, packed over the mountains from the North Thompson Valley, were planted out late last spring. On the first-named place a growth of about 3 feet was observed, while at the latter a growth of 2 feet was measured. As Mr. Smith moved on his land only last spring and the young trees were placed in newly broken ground, the result must be looked on as very satisfactory. It is probable that the trees will not "winter-kill," as there will be ample snow covering to protect the roots; but possibly late frosts in the spring may prevent their bearing, although good apples have been grown at Rossland at about the same altitude above sea. It will be decidedly interesting to learn the result of the experiment.

Although this section of the Province is suited to farming, it is believed to be pre-eminently a dairying and grazing country, as there is luxuriant pasture throughout, and there will always be ample summer pasturage on adjoining lands not adapted to easy cultivation.

Several settlers make excellent butter and cheese, production being limited to the local market, as Clinton, the nearest town, is some sixty miles distant by road.

With some improvement in roads and the completion of the Pacific Great Eastern Railway, the establishment of a cheese-factory or creamery would no doubt greatly assist in developing the district along the lines to which it is naturally adapted in a marked degree.

Timber.

The character of timber observed varies greatly in size, quantity, and quality; the ridges generally being covered with an open growth of fir from 24 to 60 inches in diameter. Some small patches of thick jack-pine are found, but for the greater part the land carries a very open growth of lodge-pole pine and poplar, through which are practically prairie openings up to 20 acres or more in extent. There are some spruce-swamps and willow-swales, but they are not extensive.

The lodge-pole pine affords excellent building-logs on account of its habit of straight, clean growth, sometimes holding its size and being without a limit for 40 or 50 feet from the ground. As small groves of trees up to 18 inches diameter were found, it is possible that they may be utilized for finishing lumber. At present all lumber used is hauled from Clinton or Lac La Hache, a trip occupying from five to eight days, or is whipsawed on the ground.

On nearly every 160 acres surveyed there is a considerable area which could be cleared for probably not more than $20 per acre, figuring labour at $2 per day. Some of the more heavily timbered land might cost from $50 to $70 per acre to clear and grub; but there is plenty of more easily cleared land, so that it would not be necessary to undertake the heavier clearing until the return obtainable from the land would warrant the expenditure.

Taking land at $60 per acre, interest at 6 per cent., and estimating a safe production of 2 tons of timothy or other hay to the acre, the superiority of the fodder produced over hay made on the wild meadows would probably more than make up the interest difference in cost; while in the case of land costing $300 per acre, the difference in quality would not offset the interest charge in converting the hay into a more valuable commodity such as beef. The figures stated above illustrate the necessity of low-priced lands if people are to be induced to enter agricultural pursuits.

Climatic Conditions.

During summer the days are usually bright and warm, with cool nights; while in winter a clear, dry cold is experienced, but not of such intensity as to prevent cattle and horses running out all winter, it, of course, being necessary to feed them when the snow becomes deep. A provision of 1 ton of hay per head of stock carried is considered ample security, and quite often only a part of it is required.

Light summer frosts are not unknown, but have not been of such severity or frequency as to discourage the settlers. In fact, from all reports of the Roe Lake section, but little damage has arisen from this cause. It is considered quite probable that summer frosts will cease entirely with the clearing-up of the country, as has occurred elsewhere.

The duration of seasons is not unlike that of Western Alberta; but, excepting an area about Green Lake, the precipitation is thought to be greater both in summer and winter, and snow lying from 2 to 2½ feet deep in midwinter. In some years a light snowfall occurs late in October, but disappears quickly; no considerable amount coming until about Christmas, although in 1911 there was deep snow in November.

On the whole, the winter climatic conditions are thought to be much more favourable than those in the greater part of Ontario; while the shelter of the forest ridges renders the physical condition superior to that of Alberta.

GAME AND WILD ANIMALS.

Remarkably little game, either bird or animal, was observed in any part of the country surveyed. The wetness of the early summer may account in part for the scarcity of game birds, as such a condition interferes with nesting and hatching of eggs. The great increase which is taking place in the number of horned owls and hawks has probably also a great deal to do with it. Nearly all men who live in the forest for any length of time know that these birds of prey do attack and destroy game birds as well as rabbits and vermin. If a moderate bounty were granted as an incentive to the destruction of horned owls, it would be a double-barrelled protection to game birds; because, since owls have a habit of perching on the tops of old snags or other prominent objects when watching for prey, and are usually taken by small traps placed on such points, it has been found by trappers that about as many hawks as owls are caught, the habits of both birds being similar in some respects.

A few willow and sharp-tailed grouse were obtained, and in October a few mallard and other wild ducks were shot. Rabbits are fairly plentiful, but not numerous; the constant toll exacted by coyotes and owls keeping the numbers down. Only three deer were seen during the season, and very few tracks were noticed. No bears were encountered, and very few signs of their presence were observed. Coyotes were numerous, treating us to nightly serenades throughout our stay. Their musical efforts at close range frequently kept us awake, causing the men to say anything but their prayers. It is extremely difficult to get a shot at them, as they are very wary, and suspicious even of a nice piece of meat with a little strychnine enclosed. Two musk-rats and one mink were trapped in our store tent, which they endeavoured to raid. Otter slides were observed at various points along the lakes, but none of the animals were seen.

Beaver are plentiful along the streams and in some of the lakes. In many places they have flooded considerable areas of what might be made good hay meadow, and this will no doubt lead to their extermination as the country is settled.

I have, etc.,
W. S. DREWRY, B.C.L.S.

KNOUFF AND BADGER LAKE VALLEYS.

BY R. H. LEE.

KAMLOOPS, B.C., October 20th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to submit the following report on my season's work during 1915 in the Knouff and Badger Lake Valleys, from the Dominion Lands Belt northward. The work this season had to do almost wholly with lands already located and recorded as pre-emptions, only four lots of Crown lands being surveyed.

The valley, including bench and bottom land, is from one to two miles in width from east to west, of uniform, regular surface, with a slight slope from the foot of the main mountain range toward the lakes, which lie in the middle of the valley and form a chain from north to south.

The soil is a good clay loam, remarkably free from stones and gravel, and especially suitable for mixed farming, vegetables, hay, and grain giving splendid returns, unsurpassed by any other section of this district.

The land is well watered by creeks and springs, giving good sub-irrigation, so that under ordinary conditions artificial irrigation is quite unnecessary.

The valley occupies an old burn, and is covered with a young growth of poplar, alder, and willow. There is no standing timber of any merchantable value. The surrounding hills and mountain ranges are sparsely timbered and suitable for grazing, producing a good growth of bunch-grass and peavine.

Climate.

The climate is good and very favourable for farming—about the same as Kamloops, with perhaps cooler nights. The springs are early and moist; summers and falls are very warm and dry, though showers are quite frequent. The winter lasts about three months, with an average snowfall of about 12 to 18 inches. The annual precipitation makes irrigation quite unnecessary.

Water Power and Storage.

The possibilities for power-development are negligible, there being no creeks of any size flowing down the sides of the mountain ranges. Water records are held on Upper and Lower Knouff Lakes and on Sullivan Creek, which drains them, and the water used for the irrigation of lands in the lower part of Sullivan Valley. A water record is also held on Badger Lakes. Badger Creek is dammed at the northern end of Badger Lake, causing it to overflow into smaller Badger Lake to the west, and a ditch from this carries the water to the upper part of Sullivan Valley, where it is used for irrigation.

Roads.

The Government-built wagon-road which branches off from the Heffley-Louis Creek Road at Alfred Devicks, some six miles from the North Thompson Valley, extends only as far as the lower end of Upper Knouff Lake. From this point some of the pre-emptors have continued it northward some five or six miles to Lot 3318, at the north end of Badger Lake. In addition to these main roads, these same settlers have built branch roads into Lots 4009, 4010, and 4014. There is also a rough wagon-road running from Lot 3318 north-westerly to the mouth of Badger Creek, on the North Thompson River.

Game.

We saw very little game during our season in the valley, but the settlers stated that deer were quite plentiful in the late fall and winter.

I have, etc.,
R. H. Lee, B.C.L.S.

VICINITY OF QUILCHENA, MAMETE LAKE, AND OTTER VALLEY.

By O. B. N. Wilkie.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—The adjustment and other surveys assigned to me near Quilchena, Mamete Lake, and Otter Valley have been carried out, separate reports on each being prepared for your Department. The localities referred to are in the vicinity of Merritt, which is reached by a branch of the Canadian Pacific Railway, and is about forty miles south from Spences Bridge, on the main line. From Merritt the Kettle Valley Railway Company operates trains through Southern British Columbia via Princeton, Penticton, Greenwood, Grand Forks, and Nelson, and joining the Canadian Pacific Railway main line again near Medicine Hat, Alberta; the towns referred to all being important as agricultural or mining centres. My party was organized at Merritt, which is the centre of an agricultural community, where general farming is successfully carried on, the land generally requiring irrigation for most crops. Good roads radiate from Merritt in all directions, which enables the farmer to market all the products. Stock-raising is carried on extensively.

About six miles from Merritt a large tract of land has been set aside as a commonage for pasturage purposes, thus enabling the small land-holder to use his entire holding for planting crops, letting his stock pasture on the commonages near by. Sheep-raising is also carried out very successfully in the district. Fruit-growing has been gone into on a small scale. Small fruits do well in portions of the district, as well as the hardier varieties of trees bearing apples, etc.

Several coal-mines employing a number of men are operating in the vicinity of Merritt. Recently there has been a certain amount of activity in copper-mining, ore having been shipped from the Aspen Grove section. Some properties in the Mamete Lake country are also being developed.

Logging is carried out extensively along the Coldwater River for the Nicola Valley Pine Lumber Company, which operates a mill at Canford, about ten miles from Merritt; another mill has been completed at Brookmere, on the Kettle Valley Railway, about twelve miles from Aspen Grove.

Crops throughout the district have been excellent, grain doing particularly well; the British Columbia Government Experimental Dry Farm at Quilchena, which is at an altitude of 3,800 feet above the sea, having results as high as 90 bushels per acre with oats. Grasshoppers, which had done so much harm last year, were not in evidence this season.

In general the Nicola Valley Land District consists of undulating country varying from open bunch-grass valleys and hills to timbered mountains. The whole is interspersed with natural meadows and willow bottoms. Farming is carried on within altitudes from 1,500 to 4,000 feet, though stock-raising predominates. Above this elevation the country is usually timbered grassy land, with occasional meadows and willow bottoms, upon which large herds of cattle range during the summer and autumn.

The average altitude of the district lies between 1,500 and 6,000 feet above the sea. The climate is very bracing and healthy and has a light rainfall. The district is well served with good wagon-roads as well as railway facilities. The Canadian Pacific Railway follows up the Nicola River from Spences Bridge to Nicola, connecting with the Kettle Valley Railway at Merritt, from which point the Kettle Valley Railway runs up the valley of the Coldwater for some thirty miles, where it crosses over to and runs down the Otter Valley to Princeton, and on through to the southern portion of the district to Penticton.

A Government telephone system connects up all the principal towns through the entire district.

Game is plentiful in these parts, consisting chiefly of grouse, ducks, geese, prairie-chicken, deer, and rabbits. Bear, cougar, lynx, and coyotes are also found. There is excellent fishing in the many lakes and streams.

I have, etc.,
O. B. N. WILKIE, B.C.L.S.

VICINITY OF OSPREY AND PENASK LAKES.

BY R. P. BROWN.

December 15th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to submit the following report on my work in the vicinity of Osprey Lake, Kamloops District, during the past season:—

Osprey Lake (elevation 3,600 feet above sea-level) is situated on the summit of the Trout Creek Pass, between the Okanagan Valley and the Similkameen River. The Kettle Valley Railway passes through this divide, Osprey Lake being at Mile 40 west of Penticton. The land to the south of Osprey Lake is mountainous, broken up, rocky, and covered with a dense growth of small jack-pine, with small areas of cultivable land, which, however, are so isolated as to be practically valueless.

To the north-west of Osprey Lake the hills are low-lying, and in the valleys there are numerous stretches of meadow land, either open and growing natural wild hay, or covered with small willow-scrub. These meadows are in many places partly under water owing to beaver-dams, but drainage can easily be obtained by cutting these dams and allowing the creeks to resume their natural channel.

The lower slopes of the hills consist of level benches and gently sloping terraces, growing scattered jack-pine, willow, and alder-brush. The soil is a sandy loam, free from rocks. The higher slopes are steeper and rocky in many places, and not suitable for agricultural purposes.

Osprey Creek Valley.

The areas of agricultural land are small and scattered, but being contiguous to the Kettle Valley Railway are valuable for mixed farming. In this section I surveyed twelve pre-emptions, two lots of 160 acres each, and one lot of 82 acres.

From Osprey Lake I moved camp to the East Fork of Siwash Creek, which empties into Five-mile Creek, draining into the Similkameen Valley. Siwash Creek lies about two miles north from Osprey Creek Valley, and flows in a south-westerly direction parallel to Osprey Creek.

For a stretch of about four miles down the creek there are meadows of an average width of 12 chains, caused by numerous beaver-dams which were built many years ago. The meadows are partly open, growing natural meadow-hay, and partly covered with thick clumps of willows. The meadows would grow good crops of wild hay, and if ploughed and seeded to timothy would eventually become very valuable. The cost of putting this land ready for cultivation would be, approximately, $15 per acre.

On either side of these meadows are level benches from 5 to 15 chains wide. The bench soil is a sandy loam with a considerable supply of humus, in which oats would grow well. This is evidenced by experiments made by J. S. Chapman, of Princeton Crossing, who, two years ago, cleared a few acres of jack-pine bench land, which he then ploughed and seeded to oats. The first year the crop was poor and only useful for grazing purposes; but this year, being the second year, a good crop was obtained, the straw growing to an average height of 30 inches and heavily headed. On this branch of Siwash Creek I surveyed one pre-emption and twelve lots of 160 acres each.

From the East Fork of Siwash Creek we moved camp to Kirton Siding, which is in the valley of Trout Creek at Mile 25 on the Kettle Valley Railway, west of Penticton, and in the Osoyoos District. In this vicinity I surveyed two lots of 320 acres each.

Between Osprey and Penask Lakes.

In accordance with your instructions, I made a general examination of the country lying between Osprey and Penask Lakes, with a view to the production of a rough sketch showing the main topographical features, and also to determine the amount of land suitable for agricultural purposes at the headwaters of Trout Creek and its tributaries.

From Osprey Lake, about twelve miles in a northerly direction to the summit of a range of hills running nearly east and west (elevation about 6,000 feet above sea-level), which is the divide between the Okanagan and Nicola drainage, the country is at an elevation of from 4,500 to 5,000 feet above sea-level, and is densely timbered with small jack-pine and windfall in many places. The soil is sandy loam, with a few to many stones on the ridges, rock outcropping in many places, and a few small areas of wet, boggy land, growing spruce-trees and dense willow-brush. There are a number of small lakes in this vicinity, most of which are teeming with trout.

Headwaters of Trout Creek.

From the head of Trout Creek to the forks, a distance of about eight miles, there is a stretch of bottom land, about five miles long and about 10 to 30 chains wide, either open and growing natural meadow-hay or covered with willow-brush; and on the north bank of the creek there are benches and gently sloping terraces, from a quarter to half a mile wide, growing scattered jack-pine, poplar, and willows—in all, about 2,000 acres of land suitable for agriculture.

Whitehead Lake.

This is the headwaters of the north branch of Trout Creek. The country is composed of natural hay meadows, of which the greater part is covered with water from 1 to 18 inches

deep, caused by recently-built beaver-dams across several narrow places; and on the north side of these meadows there are jack-pine benches, with good soil free from stones—in all, about 2,000 acres suitable for growing hay.

KATHLEEN CREEK.

This creek is on the east branch of Trout Creek, bottom land, either open and growing natural meadow-hay or covered with willow-brush; and on the south bank of the creek the land is half open and gently sloping, on which the soil is a sandy loam and free from rocks—in all, about 1,600 acres of agricultural land.

GAME.

In the basins of Trout Creek and Siwash Creek deer are fairly plentiful, and there are a few black and brown bear, two black bear having been seen during the season. Coyotes, lynx, beaver, and Franklin grouse are numerous, while in the creeks and lakes excellent fishing can be obtained. Whitehead Lake, Tepee Lakes, and Saturday Lake being especially well stocked with trout up to 4 lb. in weight.

PENASK LAKE.

Penask Lake lies about twenty miles due north of Princeton Crossing. There are four trails into this vicinity: (1.) From Princeton Crossing, on the Kettle Valley Railway; thence running up to the headwaters of Trout Creek; thence crossing over to the head of Penask Creek, and down this creek to Penask Lake. With the exception of three miles along Penask Creek, this trail is dry and open from down timber. (2.) Leaving the Princeton-Summerland Wagon-road about one mile west of Osprey Lake; thence in a north-westerly direction, crossing over the East Fork of Siwash Creek, by Tepee Lakes, Saturday Lake, and over the headwaters of Siwash Creek, to the headwaters of Quilchena Creek, and down the latter creek to Penask Lake. From the summit of Siwash Creek to Paradise Lake, on Quilchena Creek, the trail passes through a succession of meadows, which are too wet and boggy for the passage of horses until the middle of July. (3.) From Peachland, following up Trepannier Creek to the headwaters of the South Fork of Trepannier Creek, and thence north-westerly to Hazoon Lake. (4.) From Aspen Grove; thence following the Douglas Lake Wagon-road a distance of about twenty-five miles to Quilchena Creek; thence along a wagon-trail following up Quilchena Creek to Penask Lake.

From the foot of Penask Mountain, the summit of which is about eight miles due south of Penask Lake, and is the highest point in the range of hills dividing the Okanagan and Nicola drainages, the land slopes gently to Penask Lake, and is undulating country, the ridges and higher levels growing dense small jack-pine and windfall in many places. There are numerous small watercourses, which are a succession of meadows and lakes. The meadows, ranging in area from 20 to 400 acres, are in some places covered with small willow-brush, but the greater part is open and growing natural meadow-hay.

At Hazoon Lake, which lies about three miles east of Penask Lake, about twenty settlers have located pre-emptions during this last summer. Mr. Sellers, who owns a ranch at Hazoon Lake, cuts about 500 acres of natural meadow-hay annually, driving cattle in from either Peachland or Princeton to feed during the winter months.

Owing to the lack of transportation facilities at the present time, settlers who do not own stock can make good returns by contracting to winter or fatten cattle for ranchers and butchers resident in the Okanagan and Similkameen Valleys, who are finding it more and more difficult to obtain hay.

Owing to the dense growth of small jack-pine in this vicinity, and in many places windfall, it was impossible to make an estimate of the area of land suitable for settlement; but from what the writer saw and from information obtained from Mr. Sellers there are meadows and level benches, totalling a large acreage, suitable for agriculture.

I have, etc.,

R. P. BROWN, B.C.L.S.

EXPIRED TIMBER LICENCES IN COLUMBIA RIVER VALLEY, WEST KOOTENAY.

By H. C. A. Cornish.

December 9th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I have the honour to submit the following report of my subdivision into lots for pre-emption of expired timber licences, previously surveyed as Lots 7169 and 7172, and unsurveyed Timber Licence No. 12214:—

These were adjoining timber licences situated on the west side of the Columbia River about twelve miles north of Trail, and comprise a tract of land running from Blueberry Creek on the south to within two miles of Castlegar Junction on the north. In general they consist of large benches rising above the Columbia River and bounded on the west by rocky mountain-slopes. In accordance with your instructions, only such land as was suitable for agriculture was subdivided. Where there was practically no waste land it has been cut up into 40-acre lots, and where there are rocky outcrops larger lots were surveyed, giving to each lot about 40 acres of good agricultural land.

The character of the soil varies greatly with the locality. The upper benches throughout the Columbia River Valley, being geologically older, are invariably richer in soil than the lower benches, which are of a lighter sandy loam. On the lower benches irrigation is sometimes thought to be necessary for the growing of small fruits and vegetables, but many of the ranchers along the valley have adopted dry-farming methods with great success. The upper benches, which lie closer to the sides of the mountain, have natural sub-irrigation, and numerous small springs are found along the hillsides.

Lot 7169 adjoins the railroad just north of Blueberry Creek, and consists partly of a low bench just above the level of the railroad and partly of a large upper bench along the westerly side. Six lots were surveyed, totalling 320 acres. The soil is a light sandy loam, the typical fruit land of the Kootenays, and with the exception of the northerly end, where there are a few rocky outcrops, there is no waste land. A small creek flows through the north end of this lot, and if it is thought necessary to irrigate, an abundance of water can be obtained from Blueberry Creek by a flume or pipe.

Lot 7172 adjoins Lot 7169 on the north. Nine lots were surveyed on this licence, totalling 430 acres. Towards the westerly or upper side of this tract there are many rocky outcrops of small area, but the soil between these outcrops is a rich deep loam, particularly suitable for vegetable-growing. The central and easterly portions comprise a large level bench, which is some of the best agricultural land in the district, being a deep loam, free from stones. The north end of this tract has been burnt over and the soil is of a lighter nature as the result of the burning, but it is all good agricultural land. A small creek runs through the north end.

Only three 40-acre lots were surveyed on Timber Licence No. 12214, the balance of this tract being covered by an overlapping timber claim and is not at present available for settlement. The soil on these three lots is a rich loam, with a few rock-outcrops of small area. A small creeks runs through the land.

An examination was also made of Timber Licence No. 35977, surveyed as Lot 7165, which lies about half a mile south of Blueberry Creek. No land suitable for settlement was found on this licence, which covers a tract of rocky, broken hillside, and in accordance with your instructions no subdivision was made.

The area which has been subdivided is all excellent agricultural land which has only escaped previous settlement by the fact that it was held under timber licence. It was at one time heavily timbered, but the majority of the timber has been logged off, and in the course of logging operations much of the necessary clearing of the land, which would otherwise devolve on the settler, has been done. A large part of the timber was cut many years ago, and the stumps are sufficiently rotted to make clearing an easy matter. Good logging-roads have been built throughout the whole of the subdivided land, which will be of considerable value to the settler. Timothy hay and clover are widely spread over the land where the horses have been

used in the logging operations, and natural feed for horses and cattle has thus become plentiful. Hay was observed there growing 8 feet high.

The fruit-growing industry has passed the experimental stage in this district, and it is firmly established that all varieties of apples, pears, plums, cherries, and small fruits, etc., can be grown to perfection. The Doukhobor settlement on the other side of the Columbia River, opposite this land, has done much to prove what can be grown in this district. In addition to all ordinary fruits, they have this year demonstrated that peaches of fine quality can be ripened there, and they are now experimenting with grapes.

CLIMATE.

The climate of the Kootenay District is universally admitted to be ideal from the point of view of the farmer and fruit-grower. The average rainfall is about 30 inches, which is ample to provide the necessary moisture for the growth of crops. Crop-failures have not occurred in the district. The climate is mild and free from extremes of temperature. The lowest recorded temperature is 11 degrees below zero, and on an average year the thermometer does not fall below zero. The length of winter varies with the season, but as a general rule the first snow falls between December 1st and December 15th, and is gone again by the middle of March. Summer frosts are unknown.

ACCESSIBILITY AND MARKETS.

The surveyed lots are easy of access and there is no difficulty in marketing the produce. The Canadian Pacific Railway adjoins the southerly portion of the tract, running south to Trail and Rossland and north to Castlegar Junction, from which point railways run east to Nelson and through to the Prairies, and west to the Boundary District and through to the Coast on the newly completed line. A steamer service runs north from Castlegar up the Arrow Lakes, connecting with the main line of the Canadian Pacific Railway. Good wagon-roads run to Trail, Rossland, and Nelson, and there is a Government ferry across the river opposite this land.

The local market for farm produce has always been good, and with the great mineral wealth of this district, the steadily rising prices of metals, and the consequent increasing activity of the mines and smelters, an increasing population may be expected, and a correspondingly larger market. The recent enlargements of the Trail smelter and the construction now going on there of a zinc plant on a large scale will have a beneficial effect on the whole district. The lumber industry, while not carried on on a large scale, gives employment to a number of men. The local market absorbs the greater part of the output, and there is always a good demand for mine timbers at the Rossland mines.

GAME.

Game is plentiful, and deer seem to be increasing in numbers as a result of the protective measures of the Government, and the gradual killing-off of the cougar and coyote, which prey on them. It is against the principles of the Doukhobors to kill any living animal, and the Doukhobor settlement is gradually becoming a haven of refuge for all animals. White-tail deer are found on all the valley benches and black-tail deer on the hills above. The Columbia River continues to provide good trout-fishing, but the indications are that the river below the Arrow Lakes will need restocking if the supply is to be kept up.

The opening of this land for settlement offers an exceptional chance for settlers to establish themselves in a district that is already in an advanced stage of development. There are stores and post-offices at Blueberry Creek and Castlegar, and the train service of two daily trains in each direction and good roads to the distributing centres give excellent facilities for marketing farm produce.

I have, etc.,

H. C. ATHELSTAN CORNISH, B.C.L.S.

EXPIRED TIMBER LICENCES NEAR LITTLE SLOCAN RIVER, KOOTENAY DISTRICT.

BY A. H. GREEN.

August 28th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to submit the following general report on the operations of my party during the months of July and August while engaged in a survey on the Little Slocan River, Kootenay District:—

My work consisted of the subdivision of expired Timber Limits Nos. 9518, 10382, 10400, 10401, and any Crown land adjoining them; consequently I surveyed this area into Lots 12293 to 12322, inclusive, which lots take in about 200 acres of Crown land lying south of the last two mentioned limits. The soil of these lots, taken as a whole, is a sandy loam, with the exception of about 360 acres in the northern part of Limits 9518 and 10382, which is nearly solid rock, being a steep mountain-side with a southerly slope. This area was given a lot number, as its survey was practically complete when its adjoining lots were surveyed. The lots which make up the greater part of Limit 9518 are situated on a dry bench, the southern portion being stony and covered with jack-pine and buck-brush, the northern portion somewhat heavier, being a sandy loam and covered with fir, tamarack, cedar, and birch. The lots comprising the southern portion of Limit 10382 are all on bottom land from which the merchantable timber has been taken, leaving broken scrub timber, stumps, and heaps of brush. The soil is light and sandy.

Lots in Limit 10401 are made up mostly of bench land, with a narrow strip of bottom land along the river. The soil is sandy and covered with scrub timber, second-growth fir, pine, and tamarack, and a thick growth of hemlock underbrush.

Lots in Limit 10400 are made up of a series of benches, those in the southerly portion of the limit running in an easterly and westerly direction, and those next to the east boundary of Lot 4599 running in a north-westerly direction. These lots are covered with a thick, second growth of fir, cedar, pine, tamarack, and willow; the soil is sandy on the benches and rocky down on the lower ground next the river.

Lots 12318 and 12319, lying on the north side of the river, have a considerable amount of merchantable timber, mostly bull-pine and fir, and although it is very scattered, it should, however, be worth the cutting, as it is near both the wagon-road and the river. Lots 12320, 12321, and 12322, being the portion outside the limits, are on a hillside with a gradual northerly slope. The soil is a sandy loam, with scattered rock intermixed. A small creek called Four-mile Creek crosses the east boundary of Lot 4599 about a mile and a quarter south of the north-east corner of said lot, and, running in a north-easterly direction, passes through seven of the subdivision lots, and enters the Little Slocan River about a mile and an eighth east of the west boundary of the subdivision. This creek at low water is on an average of 10 feet wide and would be able to supply water for irrigation to the various lots through which it passes. There are other small creeks in the spring, but most of these dry up during the hot weather of summer. All the lots in the subdivision will be difficult to clear and bring under cultivation, but they are all suitable for mixed farming, and the present growth of hay along the river-banks suggests stock-raising on a small scale.

These lots are situate in the lower valley of the Little Slocan River, and extend from the westerly bank of the main Slocan River at Vallican westerly for a distance of approximately three miles and a half. For several years past logging companies have run logs down the Little Slocan River, in several places causing jams, which, together with the spring freshets, have caused the river, near its mouth, to overflow its low banks; consequently, through Lots 12293, 12294, 12296, and 12297, the river-bed has become very wide, with here and there two channels. For this reason, although the average width of running water is over a chain and the crossing of the river considerably difficult at high water, it has been considered unwise to adopt the river as a boundary for the four above-mentioned lots. On the other hand, in consideration of the fact that the river is difficult to cross throughout the greater part of the summer, it was thought that it should be adopted as a boundary wherever the banks became

higher and the channel more definitely cut out. In the survey of Lot 10402, George Soucey's pre-emption, the river was taken as the southerly boundary; hence from the east boundary of this lot westerly to the east boundary of Lot 4599 the river has been taken as a boundary of the lots adjoining it.

ACCESSIBILITY.

Vallican, on the Canadian Pacific Railway line from Nelson to Slocan City, is the nearest railroad point to this section. It is distant, approximately, twenty-four miles from Nelson and nineteen from Slocan City. A daily train runs over this route, and a return trip from Vallican to Slocan City can be made inside of five hours' time. A branch Government wagon-road connecting with the main Slocan Road at Vallican crosses the Slocan River at this place, and extends up the Little Slocan River a distance of about eleven miles to what are known as the lower lakes. From here northward a tote-road follows the easterly side of the lakes and river until it reaches a point on the headwaters of the river, called Beaver Creek, at a distance of about eight miles from Slocan City. Here it crosses Beaver Creek, runs north-easterly along the north-westerly side of said creek, crosses Robertson Creek near the summit of the pass, and after winding down the various benches and hillsides on the north side of this creek, finally completes its way into Slocan City, making a total wagon route—Vallican to Slocan City via Little Slocan—of approximately twenty-six miles. From the lower lake northwards this tote-road goes through a stony country, and in many places, especially along the shore of the upper lake, the rocks come nearly to the water's edge. Having completed the lower survey on August 20th, I moved up the river to a point on Sub-lot 1, Lot 7161, about half a mile north-east of the upper lake, where I made camp the second time, the distance between camps being about fourteen miles. In traversing this route I could see by reference to the map that Sub-lot 2 of Lot 7161 took in all the available agricultural land, but the valley in which was Sub-lot 1 seemed to be wider; consequently I considered it necessary to run out the south-easterly boundary of this sub-lot to make sure of the territory it included. It was found that, although the most northerly corners on this boundary were quite low down, yet to survey pre-emptions back of this sub-lot would be considered unwise, as they would take in mostly all rocky mountain-side. Again, between the lower and upper lakes, where enters Hoder Creek, there is a little bench land west of the survey-line of Sub-lot 2, but there is not enough to permit of the survey of even one good lot. The only land available, therefore, for agricultural purposes is that in the two sub-lots land 2, which, if it could be subdivided into lots extending clear across the river or valley, would make very suitable ranches.

Having satisfied myself that I would not be justified in making pre-emption surveys in this vicinity, I wired you from Slocan City to this effect, and received your instructions to close operations. I moved camp on the morning of August 27th by way of Slocan City, and reached Nelson in the afternoon of the same day.

I have, etc.,
A. H. GREEN, B.C.L.S.

VICINITY OF STILLWATER, ST. VINCENT BAY, AND SECHELT INLET.

BY J. E. LAVEROCK.

December 20th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to report regarding lands surveyed by me during the past season at various Coast points within a day's travel of Vancouver, consisting partly of logged-off lands requiring subdivision before being opened for pre-emption, and partly of adjoining recorded pre-emption claims requiring survey.

The first tract dealt with lay in the vicinity of Stillwater, a steamship landing on the east shore of Malaspina Strait about sixty-three miles northerly from Vancouver. The land open for pre-emption in the above vicinity lies about three-quarters of a mile back from the shore, and extends in an irregular belt some two miles easterly and westerly from Stillwater. Of the

area to the east a large proportion was found to consist of rocky ridges and stony, poor soil. In the area to the west of Stillwater the soil and lay of the land improve greatly, and here ten 40-acre pre-emptions and four recorded claims were laid out.

The soil on these claims is in general a light loam of good depth and fair quality, though containing some gravel. The above conditions are varied by small areas where a wet, black top soil has accumulated in depressions, and by other areas, particularly on ridges, where gravel is more prevalent than desirable.

These lands have been logged off in recent years, but the remaining debris, stumps, and cull timber will still make thorough clearing laborious work. As logging operations have, however, removed the heavy overhead growth and opened roadways, the more easily cleared areas on these claims, though scattered, can be brought into use, while the stumping and heavier clearing is more gradually carried out.

It is maintained by residents and others having knowledge of that part of the Coast from Jervis Inlet to a distance some thirty-five miles north that the rainfall in this section is less than that recorded on other parts of the Coast north or south. As the lands in question lie within this partial dry belt and are also naturally well protected, I would judge them to be specially adapted to poultry-farming or the growing of small fruits. Excellent general garden produce, including strawberries and tomatoes, are grown at Wulfsohn Bay near by, and judging by the quality and prolific growth of wild blackberries on these logged-off lands other small fruits should do well.

As the recorded pre-emptions included in the surveys made in this vicinity had been recently taken up, little progress had been made on them outside of the erection of dwellings and the making of small clearings about them. On Lot 4409 J. Goldsmith has a vegetable-garden which shows particularly well for a first cultivation of its soil.

The Brooks, Scanlon & O'Brien Logging Company have the terminus of their logging-railway at Stillwater, where the company also maintains a store as well as camp accommodation for their booming and railroad crews. There is a post-office and Government Telegraph Station here. As the wharf and adjoining lands at Stillwater belong to the logging company, general access by pre-emptors to near-by lands will have to be had from the Government wharf on the east side of Wulfsohn Bay. This wharf is centrally situated with regard to lands surveyed and is connected by a branch road with the projected and locally completed through road from Powell River to Thunder Bay.

During the past summer the All Red Steamship Line operated a daily boat either way between Vancouver and Powell River, but expect to reduce this service by half during the winter. This line, supplemented by the service of the Union Steamship Company, gives good accommodation along this part of the Coast, either for the marketing of produce or general travel. This frequent steamship service puts pre-emptors on the lands under discussion in touch with the Vancouver market, and also with the demand for produce of the large logging companies operating in normal times at Myrtle Point, Wulfsohn Bay, and Stillwater. There are also quarries at Hardy and Nelson Islands employing a considerable number of men.

The lands about Stillwater are well watered by small creeks and springs, and a stream known as Eagle River also flows through them. This river is the outlet for the Gordon Pasha Lakes, Horseshoe Lake, and Dodd Lake, having in themselves a total area of twelve square miles and a watershed some ninety square miles in area. The river has a length of about three miles and a half and a fall from its source in the First Gordon Pasha Lake of 325 feet. The rapid fall of the river as it approached tide-water, together with favourable conditions for dam-sites, etc., would seem to give this stream possibilities as a water-power, and it might profitably be gauged by the Water Rights Department.

St. Vincent Bay.

On completion of work at Stillwater the party was moved to St. Vincent Bay, Jervis Inlet. This bay lies on the northerly shore of the inlet, some nine miles up from Malaspina Strait and at the entrance to Hotham Sound. It is flanked by extended headlands, and on that forming the northerly boundary of the bay several pre-emptions have been taken up. Though these have been recorded as 160-acre claims, a large part of this area is taken up with rock knolls and ridges, and the area of good land is confined to small swampy areas lying in depressions or ravines. Some exception might be made in regard to A. Fletcher's claim, Lot 3256, where an

area of 25 acres of swampy bottom land with firm black soil occurs at north-east corner of the claim. As this was formerly timbered with cedar, clearing will be heavy, and drainage will also be required.

These claims have recently been put under record, and little progress has been made on them beyond erecting dwellings or clearing small garden-patches. On Lot 3257, at the north-west angle of the bay, however, the pre-emptor, Robert Heard, has a very fine garden of 1½ acres on a bench at the water's edge. This bench formerly supported a growth, mostly large maples and alders, which in time had accumulated a considerable depth of leaf-mould. The pre-emptor has by dint of considerable hard work cleared and graded this bench, but has now the satisfaction of having a plot of the finest soil on which a variety of vegetables, herbs, and fruits grow in great abundance and perfection.

On the west side of St. Vincent Bay certain logged-off lands, formerly comprising Lot 769, were under instruction for survey into pre-emptions. These lands were found to be little favoured as to contour or soil, a part of their area being taken up with rocky bluffs and knolls, and of the balance a greater part lies on a steep slope which rises from a narrow, irregular bench skirting the shore. Small patches of good land occur on this lower bench, but on the side-hill the land is light and gravelly, increasing in this respect as it ascends. On account of the above conditions only three lots were laid off along the shore in this tract.

St. Vincent Bay is well protected by the headlands forming its northerly and southerly sides and by the high slope on its western side. It is also attractive from a scenic standpoint, both in itself and as to its surroundings. However, outside of being developed for summer-resort purposes at a later date, I cannot see any great possibilities for the greater part of the lands surrounding it.

SECHELT INLET.

Following the completion of the work in the above vicinity, a number of surveys were made on the eastern side of Sechelt Inlet. These surveys largely comprised recorded lands where overlaps, etc., made survey desirable. This inlet has a length north and south of some twenty-one miles and an average width of about one mile and a half. Two branches known as Narrows Arm and Salmon Arm extend north-easterly from it, some ten miles and seventeen miles respectively.

The main inlet has two features perhaps worthy of remark. One is that had it extended three-quarters of a mile farther south it would have cut through to the main Coast again at Sechelt. The intervening neck of land is low-lying and crossed by a good wagon-road, thus making the southern end of the inlet accessible from the outer Coast and main line of travel.

As a second feature I would remark the existence three miles from the entrance to the inlet of what are known as the Skookumchuck Rapids. Here the inlet channel is restricted by headlands as well as by islands and sunken reefs. The area of the inlet inside these rapids is about thirty-five square miles, so that during a change of tide a large volume of water has to rush through this restricted channel, and being set into commotion by the irregularities of the same produces rapids which are a sight well worth seeing. These rapids are, however, somewhat of a hindrance to navigation, for with average tides they are only safely navigable during half-hour periods at slack water.

To the north of these rapids the lands along the eastern shore of the inlet feasible for use are confined to the small benches occurring along the water-front. Back of these the land rises steeply, and such upper benches as occur are difficult of access.

The soil on the benches along shore is of good quality, containing much humus or mould, and though these benches are limited to a few acres in area they make comvenient home-sites. As such they have been taken advantage of by fishermen who ply their trade in the fishing-grounds off-shore, and who work on their pre-emptions in off-seasons and spare time. No extensive clearings have as yet been made, but each settler grows enough potatoes and other vegetables for domestic use.

Along this eastern shore little heavy timber occurs, the growth being largely fir and hemlock averaging 8 inches in diameter, with patches of alder along shore.

In the vicinity of the Skookumchuck and other such rapids along the Coast marine life in various forms is exceedingly abundant, due probably to such localities offering better oppor-

tunities for feeding. The above fact would seem to have some bearing on the existence near the above rapids of the fishing-grounds formerly referred to.

The staple fish caught on these grounds is the grey cod. Other varieties of cod are also found, and spring and other classes of salmon are fished in season. The fish are sold as caught to buyers, who operate large launches out of Vancouver and make this the northerly end of their collecting trips.

Along the eastern shore of the Skookumchuck Rapids the land is low-lying and extends back for about one mile in the form of low benches and slopes before rising steeply. South of the rapids the eastern shore of the inlet is paralleled for half a mile by a low rocky ridge, with a belt of good level land behind it. This condition in turn gives way to a low sloping bench along shore backed by steep slopes, and in continuing southward to Narrows Arm the water-front becomes steep and rocky.

On these various areas the general soil is a reddish loam of good quality, but areas of a fine silt soil, others of brown mould, and others of marshy land with black soil also occur.

The timber-growth on these lands is mostly second-growth fir averaging 10 inches diameter. With this grow hemlock, cedar, and in places tracts of alder. Scattered sticks and small patches of merchantable fir also occur.

Narrows Arm.

On completion of surveys along Sechelt Inlet as far south as Narrows Arm a connecting traverse was made up the west shore of the latter, and three lots laid out adjoining the narrows from which this arm takes its name.

The claim under record here, Lot 4438, contains some 5 acres of good soil, where a growth of large maples has accumulated a depth of mould. Of the balance of the claim, part is stony land and part also steep. Of the other two claims taking up the available land in this vicinity, the tillable area is confined to a small flat along shore. Although logged over, clearing on all land hereabout will be heavy.

Narrows Arm has an average width of three-quarters of a mile, but at the "narrows" this width is reduced for a short distance to 100 yards. The tidal current here is not excessive or turbulent.

The shores of the arm are paralleled by high mountain ridges which in places rise steeply from the shore, but in other places the shore recedes in low slopes or flats for half a mile or more before rising steeply. These flats are almost entirely timber lands under licence, so that for the present little land is available for pre-emption on this arm.

Storm Bay.

Surveys were now continued on the headland separating Narrows Arm from Salmon Arm. The west shore of the headland is followed by a broken rock ridge, but behind this a valley runs south from Storm Bay, at the north-west angle of the headland. On the shores of the bay and in this valley several claims have been recorded, surveys of which were carried out.

In this valley the general contour is level and the soil is a dark loam of good quality. Though this valley has been logged over, clearing will be heavy, there remaining much rough cull timber, both cedar and fir, and in places the second growth is of large size.

As claims in this locality with one exception have been recently taken up, little work has as yet been done on them. On W. Gregg's claim, Lot 3285, however, a dwelling and outbuildings have been erected and some clearing done.

General Remarks.

Though its southerly end is only some thirty-one miles from Vancouver, little general development has as yet taken place on Sechelt Inlet. Direct entrance to it by water is roundabout and made awkward by the rapids formerly described, so that it has as yet no regular steamship service, nor is it travelled to any great extent by small craft. It is thus not so well known or so attractive to settlers as it might otherwise be. However, as the present settlers become better established and there is a revival of the logging industry, a regular launch service on the inner part of the inlet could be established, connecting with the main Coast across the portage at Sechelt.

The Union Steamship Company's boats make a weekly call at the entrance to the inlet, and a weekly mail for the southerly part of the inlet comes by way of Sechelt to the post-office at Shaw's Cove, on Lot 3746.

Several shingle-bolt camps now operate along shore and local pre-emptors have been finding work in these cutting bolts. A shingle-mill at the head of Salmon Arm has large contracts and provides a market for these bolts. These constitute the local industries and market at present.

I have, etc.,

J. E. LAVEROCK, B.C.L.S.

EXPIRED TIMBER LIMITS ON OKEOVER ARM, POWELL LAKE, AND SECRET COVE.

BY N. F. TOWNSEND.

December 7th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to report on the surveys carried out on Okeover Arm, Powell Lake, and Secret Cove. The work at Okeover Arm consisted of subdividing some expired timber leases into lots of approximately 40 acres, omitting such areas that had no agricultural possibilities. Okeover Arm, the southern arm of Malaspina Inlet, is about fourteen miles from Lund by water, and from three to four miles from that settlement by trail. It can easily be reached from Lund by small boat or launch, as well as by trail, the passage by water being well protected for a considerable part of the way before the mouth of Malaspina Inlet is reached, by the Ragged Islands, and when once in the inlet there is not much danger. The arm shallows towards the end, but is navigable for tugs and small craft, provided, of course, they are in the hands of persons having a knowledge of these waters. Through the flat at the southerly end of the arm, which is an Indian reserve, flows a small stream, at the mouth of which a native oyster, rather larger than the Olympia oyster, is found in small quantities. On the western side, near the head, there are a few settlers, and a school-house has already been built. The arm has a width ranging from three-quarters to one mile, and is protected on the west by a ridge having an elevation of between 300 and 400 feet, and from the north by the narrows; consequently there is seldom any heavy sea. Lund, the nearest regular point of call for steamers, is well served by the Union Steamship Company, there being several boats a week. It is about eighty miles from Vancouver and is in what is known as the semi-dry belt of the lower Coast; that is to say, the precipitation in that vicinity is considerably less than in the districts to the north and south. Lund itself is provided with a post and telegraph office, a good store, hotel, and a machine-shop where ordinary repairs can readily be made. It is the centre for the logging industry for the neighbourhood, and is at times largely patronized as a summer resort.

As regards the area embraced in the survey, it lies on the east side of the arm about a mile and a half from the head, thus having a westerly aspect. Generally speaking, the land rises abruptly from the shore to a height of about 100 feet and then goes back in a series of slightly sloping irregular benches, and gravelly and rocky ridges to the mountain. Some of these benches are saucer-shaped and contain small swamps and patches of good soil. The best of these patches is to be found on Lots 4521, 4524, and 4525. Most of the land has been logged off, but apparently a large fire swept over the southern portion before the logging operations were finished; thus there is a good deal of dead and burnt standing timber, as well as a considerable quantity of fallen debris. At the north end there is more standing timber and reproduction. The timber is, however, generally small and scattered. This zone is more broken up and rocky than the south end, but between the ridges of rock are several small patches of good-looking soil, somewhat swampy. The contour of the country is, however, such that drainage could easily be accomplished. The eastern side attains an elevation of about 700 feet, has all been burnt over, and is comparatively free from underbrush. The soil is gravelly, but here again occur patches of good soil between the ridges. Owing to the fact that at one time there were logging camps on the leases there are several skid-roads. These in many places are overgrown with brush and have fallen into decay, yet even now they provide an easy access to many of the

lots. These roads, as a rule, follow the low places, and most of the best land is adjacent to them. Taking it all round, there is a moderate water-supply, and, even this summer, which was unusually dry, some of the creeks had plenty of water in them, while in the low places there were generally a few small water-holes. Owing to its situation the climate is very temperate, and judging from the results obtained by Mr. Vaughn in his garden, it is evident that vegetables can be grown successfully if properly attended to. From him we were able to obtain cucumbers, tomatoes, cabbage, and lettuce, all grown and ripened out-of-doors in July. Owing to prevailing conditions there is at present not very much logging going on in this vicinity, but there is still a large quantity of timber to be cut on and adjacent to Malaspina Inlet. The fact that the paper-mill at Powell River is running full time should provide a ready market for any timber capable of being manufactured into pulp. Fishing is another industry carried on in the neighbourhood. There is a run of salmon up Toba Inlet in September and October, and some canneries establish temporary camps there for the purpose of buying fish from the fishermen. Many of the settlers take advantage of this and fish during the season, which greatly assists them in making a livelihood. At certain times there is good fishing in the arm itself, but hardly on a commercial scale. Deer are said to be fairly plentiful and a few grouse were seen.

Powell Lake.

Here, as at Okeover Arm, the work consisted of subdividing an expired timber lease into 40-acre lots. The lease in question is situated about eight miles from the foot of the lake. Powell River, the site of the Powell River Paper Company's plant, is a thriving place and impresses one as wearing an air of general prosperity. It has a daily connection with Vancouver. Besides the paper-mill, there is a shingle-mill in course of construction at the foot of the lake, and several logging-camps on the lake itself. At present the means of transportation from the wharf at Powell River to the lake, a distance of about a mile, is not very satisfactory and is rather expensive. There is a weekly mail service up the lake, and by arrangement mail will be delivered at almost any point at least once a week.

Powell Lake itself is a large sheet of water some twenty-five miles in length. The mountains rise rapidly from the shore, and the few flats that originally existed have been considerably reduced in size by the raising of the level of the lake for power purposes. Respecting the area embraced in the survey, it may be divided into two pieces. One at the head of a large bay, and the other near the south-east extremity of the same bay. These two areas are separated by a steep, barren rocky hill. At the north end there was at one time a very much larger flat than at present. Generally speaking, the country slopes back rather rapidly from the lake. The soil is a gravelly loam, with heavy underbrush and small timber. Towards the northern extremity of that portion of the lease surveyed there is a nice well-watered flat with good soil. The western side is rough, brushy, with much dead and rotten fallen timber. It was only possible to get in four lots in this parcel of land. Most of this has been logged, but there is a good deal of small standing timber left. The bed-rock is granite, which in several places comes to the surface and forms bluffs. This area is well supplied with creeks, which flow through small ravines. As regards the southern lots, they consist of low passes with good soil, lying between gently sloping hills. This does not apply to Lot 4536, which consists of an amphitheatre, with steep and precipitous bluffs on the north and west sides, sloping gradually down to a picturesque and well-sheltered bay. The soil on these lots is a sandy loam in which good vegetables can be grown. They are all well supplied with springs. This part has been thoroughly logged and burnt over, but there is a good deal of fallen timber. On the slopes the soil is more gravelly, and even rocky in places. These lots all have small bays on them where boats can be safely kept, a boom of some kind being absolutely necessary on the lake owing to the vast amount of driftwood which in many cases prevents a landing being made.

Powell Lake seems to be included in the semi-dry belt which exists along this part of the Coast, and being hemmed in by high hills it gets very hot there in summer. This season the heat was intense, and as there was no rain during the summer everything was parched, and to obtain satisfactory results it was necessary to resort to watering. Whether a system of pumping from the lake would be feasible is a question, but if water can be got on the land it would no doubt greatly enhance its value. Owing to the close proximity of this subdivision to Powell River there should be a ready market for any garden-truck that can be raised.

Powell Lake is a very favourite resort for sportsmen, there being excellent trout-fishing in the creeks that flow into it, while in the lake itself there is at times very good fishing. Deer are said to be plentiful, and bear and goat can be found in the adjoining hills. Motor-boats and guides can be obtained at Powell River.

SECRET COVE.

Secret Cove, which was apparently the name originally given to a narrow inlet of about three-quarters of a mile in length, lying to the south-east of Turnagain Island, as now generally understood, embraces in addition all the water lying between that island and the Sechelt Peninsula. This latter sheet of water, though of comparatively small extent, being less than a quarter of a mile in width and navigable for perhaps twice that distance in the other direction, forms a naturally picturesque and admirably sheltered harbour for small craft, and is much used in stormy weather, more particularly as a refuge for tugs and log-booms. There is a good entrance at the south of Turnagain Island, and at high tide a narrow channel, separating the northerly end of that island from the mainland, admits of the passage of rowboats. This, however, is dry at low water.

At present the steamers plying along the Coast do not make Secret Cove a calling-point, although provided sufficient inducements offer, they will as a rule land passengers and freight there. The nearest regular point of call is at Half Moon Bay, a distance of about four miles by the Telegraph Trail. The All Red Company's steamers call there three times a week. At the latter settlement is a post and telegraph office and a small store. Buccaneer Bay, on Thornmanby Island, about three miles distant, is served by the Union Steamship Company. Like Half Moon Bay, it is a very popular summer resort.

The principal industry in the neighbourhood is fishing, and there has recently been established a herring-curing plant at Pender Harbour, about ten miles farther up the Coast. Several varieties of salmon and cod are plentiful in Secret Cove and immediate vicinity, and many fishermen make the sheltered inlets of Secret Cove and adjacent natural harbours their headquarters during the season. The shore-line of the cove is rather rough and broken, the land rising steeply from the shore for a little, and then sloping back more gradually. As is usually the case, the skid-roads run through the lowest and best places, and are of great assistance in getting to some of the lots. The two westerly lots, being on the outside, are somewhat exposed and there is no shelter for boats; the remaining ones that front on the water are all protected. Numerous small creeks cross the northern boundary, and these were, without exception, all dry in September; in fact, owing to the unusually dry season, all the creeks except the one on Lot 4550 were empty. This would appear to be exceptional, as at one time there were logging camps near the beach and tugs frequently called in for water, which was obtained from a creek running into the cove near the south-east of Lot 4541.

The whole piece subdivided is broken up by rocky ridges, between which are small patches of loamy soil, covered with brush in some places, and inclined to be swampy in others. On many of the ridges there is a good covering of grass which might make good feed for sheep. In some parts the timber has all been cut, but there are still small stands of fir remaining. Some prospecting for mineral has been done along the shore, there being two short tunnels and a pot-hole or two. These seem to have been abandoned some time ago. The country appears to be too much broken up to prove a profitable mineral zone. A fair trail follows the Dominion Telegraph Line through the subdivision, and is traversed once a week by the linesman from Pender Harbour. This trail, though somewhat rough in places, could easily be improved.

There are only a few spots where the settler can at once begin farming operations, and in most cases it is necessary to commence by clearing sufficient space to build a house. The land under review, being expired timber leases, has for the most part been denuded of the best timber, and is consequently comparatively cleared, although it would be unjust to say that logged land comes under the category of cleared land ready for cultivation. Until the present "Forestry Act" came into force it was not considered necessary to clean up and burn the debris, the result being that on these old limits there are great tangles of useless logs, tops, and limbs matted and mingled together in a confused mass. Under present conditions matters have improved in this respect, but at the same time the stumps have to be removed before satisfactory

results can be obtained. The actual cost of clearing varies considerably. The cost of clearing the southern part of the land at Powell Lake would be probably in the neighbourhood of $150 per acre, while that at the northern end would cost nearly twice as much.

At Powell Lake there is a good deal of logging going on, while at Okeover Arm there is lumbering and the fishing, and at Secret Cove there is the fishing, on which the settlers can rely to some extent as a means of assisting them to make a living.

As to markets, all these lots are within a reasonable distance of steamboat landings, and there is a good local demand for fruit and vegetables at the near-by summer resorts and camps.

I have, etc.,

N. F. Townsend, B.C.L.S.

EXPIRED TIMBER LIMITS IN SAYWARD DISTRICT.

By H. H. Roberts.

December 11th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—The lands surveyed are situate on Cortes, Read, Quadra, and Maurelle Islands, in Sayward District. Viewed from the water, these islands present a somewhat rugged and mountainous appearance, and the observer might be led to infer that they contain little land suitable for agricultural purposes. A closer inspection, however, will prove that behind a rough and rocky shore-line can be found land suitable for settlement. As yet, these islands are not very well served with roads. Communication is chiefly by steamer. The Union Steamship Company maintains a bi-weekly service to many ports of call.

The season's work was chiefly the subdivision of expired timber limits and adjacent Crown lands. A few unsurveyed pre-emptions were included in the surveys. Forty-acre blocks was the standard adopted in the subdivision work, but this method was departed from where larger blocks were found to better suit local conditions. In all, fifty-five lots were surveyed, varying in size from 40 to 200 acres.

A 35-foot gasolene-launch with 12-horse-power engine provided transportation for the survey party, and a rowboat fitted with a Wisconsin engine was of material assistance in carrying out the season's operations.

Cortes Island.

Cortes Island lies at the head of the Strait of Georgia. Sutil Channel separates it from Read and Quadra Islands, and Lewis Channel divides it from the Redonda Islands. The length of the island is about fifteen miles in a northerly direction, and its width varies from one to seven miles; the greatest width being at the centre. The coast-line is indented by several bays and creeks, in many of which good anchorage can be found.

Cortes Island is well settled and better served with roads and trails than any of the neighbouring islands. The chief settlement is around Manson's Landing and Whaletown, on the westerly side of the island. Whaletown has a general store and post-office, and Manson's Landing boasts of a Farmers' Institute co-operative store, post and telegraph offices, and a school. Steamboats call regularly at both places. Single fare from Vancouver to the Landing is $4; return fare, $7. Freight charges between these points are $3.50 per ton.

Surveying operations were commenced on Cortes Island, where portions of Sections 5 and 10 were subdivided in 40-acre blocks. These tracts are situated on the south-east end of the island, and front on Blind Creek and the Strait of Georgia. The distance from Manson's Landing is about three miles, and trails lead from this area to a road connecting Manson's Landing with Smith's Landing, on the east side of Cortes Island. Blind Creek contains good anchorage. The entrance is narrow, and in the centre of the channel is a rock which is covered at certain stages of the tide. For safety it is advisable for boats to keep about 50 feet from the shore on the south side of the channel.

The contour of this land is broken up by low rocky hills and knolls. The prevailing soil is sandy loam, inclined to be gravelly; though patches of good brown loam soil almost entirely free from stones are scattered throughout the area. Practically all the blocks contain small areas of first-class land. The central portion of this land was recently logged off and contains a considerable amount of logging debris and windfalls. The whole area, however, contains a fair amount of standing timber, more than ample for pre-emptor's needs. The cost of clearing will vary from $80 to $250 per acre.

Creeks are scarce on this land, but many springs of water were found; and where there are no surface streams shallow wells will generally reach good water.

These blocks might be made suitable for mixed farming, or sheep and cattle raising on a small scale. Sheep are being raised very successfully by John Manson, whose ranch is about two miles to the west. Small fruits and vegetables should grow well.

READ ISLAND.

Read Island, where the greater part of the season was spent, is ten miles long and from one to three miles broad. Its southern portion is low, but rises gradually to the northward to about 1,600 feet. The shore-line is rocky, steep-to, and much indented, more especially on the east side. This island is sparsely settled, the present population being about forty. The settlers are chiefly occupied with hand-logging, the raising of garden produce and chickens; while a few are successful with cattle.

In Burdwood Bay, on the east side of Read Island, Lots 1004 to 1007 were surveyed. The soil on this area, apart from ridges and knolls, which are rocky, is sandy or light loam. In parts there is much swamp soil, and in places black loam soil almost free of stones was found. These lots have been logged off, but a recent fire cleared out the logging debris, thereby making the task of clearing this land much easier. The cost of clearing the first-class land within these lots will average $150 an acre. Hogs should thrive on this land, as they are being successfully raised under similar conditions on a near-by ranch. Burdwood Bay has a post-office and a weekly boat service, which provides the rancher with an easy means of marketing his products.

Lots 283 and 284, on the west side of Read Island, were cut up into five blocks averaging 40 acres in area. Hoskyn Inlet forms the west boundary of Lot 284. The south-eastern portion of Lot 283 is easy of access by a good trail leading from Burdwood Bay. These lots are badly broken up by rocky ridges, and the area of first-class land is small. Excepting the south-east quarter of Lot 283, none of this land has been logged. A recent fire, while it damaged the standing timber and vegetation, was instrumental in clearing the land of debris and underbrush. Loam well mixed with sand and stone is the prevailing soil. Bold Point, which has a post-office and a bi-weekly boat service, is about a mile and half away on the opposite side of Hoskyn Inlet. The nearest store is at Surge Narrows.

Lots 1008 to 1016 and 1029 are situate in the centre of Read Island and are easy of access both from Hoskyn Inlet and Bird Cove. Lots 1008, 1010, 1014, and 1015 are very rocky and broken, but would in my opinion be suitable for sheep-raising. The soil on the remainder of the lots is for the most part a good sandy loam, with patches of black loam. Lots 1013 and 1029 are settled upon. The latter lot shows a very productive appearance after a short occupancy, and the former also gives promise of a good future.

On the east side and head of Evans Bay Lots 1017 to 1025 and 1043 were surveyed. A skid-road gives access to Lots 1025 and 1043 from White Rock Bay. Good land was found in this part of Read Island. Lots 1020, 1023, and 1024 have already been taken up. This tract has been logged off, but the timber still standing is of a fair grade and ample for the needs of settlers. The northernmost lots are within easy distance of store and post-office at Surge Narrows, and the lots in the southern portion have postal and boat facilities at Burdwood Bay.

QUADRA ISLAND.

Quadra Island is the largest of the Valdes group of islands. The work on this island only consisted of subdividing old Timber Limit Lot 439, fronting on Open Bay and Sutil Channel. Lot 439 was subdivided into three lots—viz., 1026 to 1028. These lots are covered by pre-emption records, and considerable improvements have been made by the settlers on Lots 1027 and 1028.

Maurelle Island.

Maurelle is the smallest island of the Valdes Group. Hoskyn Inlet divides it from Read Island, and contracts at its northern end into a narrow boat passage, choked with rocks and almost dry at low water. Lots 1030 to 1042 are at the south end of Maurelle Island, being subdivision of old Timber Limit Lots 106 and 450. This block of land contains the best land surveyed during the past season. Lots 1030, 1031, and 1033 are excellent for agricultural purposes, while Lots 1032, 1034 to 1036, 1040, and 1041 contain a fair amount of first-class land. The remainder of the subdivision is rather rocky and broken. The soil varies from light sandy loam to black loam.

This land has been thoroughly logged off. Clearing will be comparatively easy. Many stumps will have to be taken out, but fires have done good work in the way of clearing underbrush, debris, and windfalls. A squatter, F. Kilpatrick, has a good house built and a garden in cultivation on Lot 1040. Another squatter, T. Keefer, has a nice home and garden on Lot 1041. The latter is also the owner of sixteen head of cattle, which, he finds, do remarkably well on the land throughout the whole of the year. Surge Narrows post-office and general store are within convenient distance of this tract.

Climate.

Similar climatic conditions prevail on these islands as in Vancouver and surrounding district. Rainfall is about 70 inches. The past summer was drier than usual, there being only four or five days' rain from the beginning of June to the middle of September. Summer temperature seldom rises above 80° Fahr., or falls much below zero in winter. The prevailing summer wind is from the north-west, and during the winter months southerly gales are frequent.

Markets.

In normal times settlers can dispose of most of their produce in the logging camps. During the past year beef, eggs, and garden produce have been marketed in Vancouver, Powell River, and summer resorts on the Coast.

Game.

Deer and grouse are plentiful on the islands described in this report. Ducks and geese were seen on the inlets. Cod and salmon are very abundant all along the Coast.

I have, etc.,

H. H. Roberts, B.C.L.S.

SAYWARD AND COAST DISTRICTS.

By Frank Tupper.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—Under your instructions, surveys were made by me in the Sayward and Coast Districts during July, August, September, and October, 1915. I commenced operations at Elk Bay and made surveys at the following points along Johnstone Strait, viz.: Elk Bay, Sonora Island, Hardwick Island, Blinkinsop Bay, Chancellor Channel, Port Neville, and Port Harvey. The surveys comprised the subdivision of portions of expired timber limits into 40-acre lots and pre-emptions lately taken up.

Elk Bay.

At Elk Bay I surveyed five 40-acre lots, Nos. 973, 974, 975, 977, and 978. These lots are for the most part good land, which has been logged off many years ago. It is now covered with dense second-growth and fallen timber. The cost of clearing would consequently be somewhat heavy. The lots are well watered by small creeks and are easily accessible to Elk Bay by an old skid-road, which with very little trouble could be converted into a very good road. These lots lie in a rather narrow valley bounded by rocky hills on the north and south.

SONORA ISLAND.

On Sonora Island I surveyed four 40-acre lots, one lot of 62 acres, and one pre-emption of 160 acres. These lots, Nos. 968 to 972, inclusive, and 976, are situated in a valley or basin surrounded by rocky hills which is drained by a nice creek. The soil is good along the creek, and there is a good flat on the pre-emption with rich soil; the balance of the soil is more of a gravelly nature. This country has been swept by fire during the last few years, and the ground is now covered with dead and fallen timber. There is a heavy growth of wild blackberries and raspberries over almost the entire area. An old skid-road gives easy means of access from Johnstone Strait.

HARDWICK ISLAND.

On Hardwick Island I surveyed five pre-emption claims containing an area of 525.4 acres, also two lots containing 70.8 and 66.8 acres respectively, all fronting on Johnstone Strait. The country here, for the most part, consists of a strip of good land along the shore which extends back on an average of about 10 to 15 chains. The northern portion of the different lots is very poor rocky country. The northern line runs through very steep and precipitous country in places. All these pre-emption claims, with one exception, are occupied by their respective holders. They have all erected cabins and have done a little clearing, and so far have been able to raise sufficient vegetables for their own use. These lots are all logged-off lands and are covered with dense second growth and windfalls.

Before leaving this locality I also surveyed and tied in Helmcken Island, lying in Johnstone Strait opposite Hardwick Island. This island contains 334 acres. It is rough and rocky and contains practically no good land.

BLINKINSOP BAY AND SUNDERLAND CHANNEL.

At this point I surveyed three pre-emption claims containing 273.6 acres, one purchase claim of 167.4 acres, and three other lots of Crown lands containing 40, 40.7, and 53.4 acres respectively. These holdings and lots are numbered 1767 to 1773, inclusive. The lots, with the exception of Lot 1773, all front on Blinkinsop Bay or Sunderland Channel.

The country embraced by these lots is very rough and broken, with occasional small areas of good flat land. On each of the pre-emptions there is a small area of good land on the water-front, where the settler has erected his cabin, and in each case has done a small amount of clearing. Apart from this small area, the rest of the coast-line consists of steep rocky bluffs. On one pre-emption I saw fine potatoes, turnips, carrots, cucumbers, and tomatoes growing.

CHANCELLOR AND WELLBORE CHANNELS.

At this point I found some particularly good land. I surveyed in all ten lots, numbered 1774 to 1783, inclusive, and containing an area of 454.7 acres, none of which has been pre-empted. The lots that I would class as exceptionally good are Nos. 1774, 1776, 1779, and 1782. Lot 1774 is low-lying and fronts on a nice beach; with the exception of a small area at the north end, it is practically all good land, and is timbered with a little spruce, hemlock, and cedar, and covered with a thick growth of second-growth hemlock, devil's-club, etc. The other three lots mentioned are practically level and are nearly all good soil. All are well watered by several small creeks and are easily accessible to the shore by an old skid-road. Lots 1780 and 1781 are steep and rocky along the shore, but there is an area of good land on each near the north boundary. Lots 1777 and 1778 run up on the mountain-side, which is rather rocky, but there is a strip of very good land on each lot at the south end. Lot 1783 is on an elevated bench which rises gradually towards the north. The soil is of a gravelly nature, and the rock is rather close to the surface in places. On Lot 1775 there is practically no good land, but I was obliged to survey this lot in doing the others.

PORT NEVILLE.

I surveyed four 40-acre lots at this point. These are a portion of old Lot 37, and are, I may say, about the best land surveyed by me this season. They are numbered 1784 to 1787, inclusive. Lot 1784 touches the shore at the south-east corner, and is nearly all good alder-bottom land. It is practically level. Lot 1785 is very similar, except at the north-west corner, where

it is slightly hilly. Lot 1786 is about two-thirds good land. The north-west corner runs high up on a steep rocky mountain-side. Lot 1787 is nearly level and all good land. All these lots are well watered by small creeks. There is practically no big timber, the whole having been logged and also burnt over many years ago.

Port Harvey.

At Port Harvey I surveyed three pre-emption claims, Lots 1788, 1789, and 1790, all occupied by their respective holders, who have erected dwellings and done a little clearing. Lot 1788 adjoins Indian Reserve No. 2 on the north and contains 161.2 acres. Along the south boundary there is a strip of fairly good land, while there is also a small flat of good land inland from the north-west corner. The balance is of rough, broken, mountainous country quite useless from an agricultural point of view. Lot 1789 (Mist Island) is a rocky island of 35.25 acres. There is a small area of fair soil near the south end where the settler has his home. The balance is poor and rocky. Lot 1790 is a small strip of 4.5 acres lying between Timber Limit 42873, Lot 70, and the shore. It has been swept by fire during recent years; the soil is of a gravelly nature for the most part, but the rock outcrops in places along the north boundary.

Agricultural Possibilities.

With regard to the agricultural possibilities of the different tracts surveyed, I may say that from what I have seen on several pre-emptions, etc., all kinds of vegetables and roots seem to do exceedingly well where the soil is at all good. I saw splendid potatoes, carrots, cucumbers, cabbage, etc., on several pre-emptions at Blenkinsop Bay, Sunderland Channel, Hardwick Island, and Port Harvey. Tomatoes do well and ripen in the open.

Markets.

There is a good local demand for all the truck that can be grown at the different sawmills and logging camps scattered all along the Coast, and this market is likely to last for many years to come. The City of Vancouver, to and from which there is a good weekly steamship service, should supply a good market for all time.

Transportation.

The Union Steamship Company run a weekly line of steamers which call once a week at Rock Bay, Salmon River, Port Neville, and Port Harvey. As these points are each within a few miles of the different tracts surveyed, settlers should have no difficulty in getting their produce conveyed to the Vancouver market should they so desire.

Climate.

The climate is very wet during the winter months, while the summer months are perfect for the growing of root and other vegetable crops. The snowfall is comparatively light; 18 inches, I am informed, is about the maximum, and in some winters there is practically none at all. Summer frosts are almost unknown.

Timber.

There is plenty of timber for fuel and logs for the building of settlers' cabins, fences, etc.; while lumber can easily be obtained from the numerous sawmills along the Coast.

Game.

The country is very good for game all along the Coast. Deer are plentiful on many of the islands as well as on the mainland. Ducks and geese are very plentiful on the different bays and inlets during the autumn, while black bear are also fairly plentiful in places. Fish, such as salmon, halibut, and cod, are plentiful and easily caught all along the Coast.

Settlement.

There appears to be a good demand for pre-emptions all along the Coast. I had numerous inquiries at almost all points, and I am of the opinion that any land, that is at all suitable for

settlement, that is thrown open will in the course of the next few years be all taken up. Once the settler gets a few acres cleared, he should be able to make a very comfortable living, as he can obtain a ready local market for all he can grow.

I attach blue-prints of each group of lots surveyed which show all the principal topographical features, etc.

I have, etc.,
FRANK TUPPER, B.C.L.S.

SAN JOSEF AND CAPE SCOTT DISTRICTS.

BY H. H. BROWNE.

ALBERNI, B.C., October 11th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—I have the honour to submit herewith the plans and field-notes comprehending the surveys carried out this year. The work was of a scattered nature, owing to the necessity of filling in gaps left in former years. Very little remains to be surveyed of the "Reserve of August 29th, 1907," perhaps no more than a party could do in four or five months, considering the long moves.

The Cape Scott end of Rupert District is not only surveyed, but settled. Only a few miles of line will have to be run to permit the settlers to obtain their Crown grants. For the most part, so far as my observation goes, the improvements are of a lasting character. Of course, it happens here, as in other parts of British Columbia, that land will be taken up, improved to the minimum, and then left to become an encumbrance, just because the settler must go out to earn money. People with capital seldom settle on Crown lands. A lenient treatment is, perhaps, due to those who take the initial effort, which is all they may be able to do at once.

It is true, I believe, that nowhere in British Columbia can such prolific yields of vegetables and small fruits be had as in the San Josef and Cape Scott Valleys. But there is no market. So, what are the people to do? The younger men do what they must do—go elsewhere and work for wages. This year the young men had good fortune at the fishing in Queen Charlotte Sound, reaching an average of well over 2,500 fish to the boat, which at "one bit" a fish is not so bad. Some were employed at the Elk Lake Mines, near Quatsino; some had employment on the roads and land surveys. So, altogether, there seems a feeling of content. A few who, for domestic reasons, had to remain at home will need some extraneous help, which might come through the upkeep of roads.

I have had the honour to report to you so fully in former years upon this country that it would seem idle to repeat myself now as to its character and possibilities. I did, however, find a good valley in Sections 5 and 6, in Township 41, which, if divided into small holdings of, say, 40 acres, might easily support a dozen settlers. There are no meadows, but there are many salmon-berry patches, and the timber is not very thick. The valley is only five miles from the store and post-office at San Josef Bay. The post-office is on the telephone-line from Alert Bay to Cape Scott.

The shortness of the season prevented a more extensive examination of this valley.

I have, etc.,
H. H. BROWNE, B.C.L.S.

VICINITY OF CAPE SCOTT, NORTHERN VANCOUVER ISLAND.

By L. S. Cokely.

December 22nd, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—My work for the past season was situated in the vicinity of Cape Scott, near the extreme north end of Vancouver Island. Cape Scott is a comparatively old settlement, being settled some twenty years ago by the Danes. These first settlers turned their attention to the tide-flats at the end of the long lagoon just south of Cape Scott. These flats, with the aid of the Provincial Government, were dyked off and converted into excellent hay meadows, forming the foundation of the dairying industry through which the locality became favourably known in later years. Only a few of the Danish families still remain, and the present settlers are mostly Canadian, English, and Scotch. There are many more settlers than one might expect, and I was surprised that there should be over 200 attend the very successful fair held by the Cape Scott Agricultural Society during the summer.

Physical Characteristics.

The settlement of the district is retarded, to a large extent, by the physical characteristics of the country itself. The north end of the Island from Cape Commeral to Cape Scott is very regular, there being no stream of any size and no inlets. As this Coast is exposed to the rigours of the open Pacific, the absence of any shelter for boats is a serious obstacle. In winter, when northerly gales are frequent, it is often impossible for boats to make a landing for days at a time. Six miles east of Cape Scott is a small bay, Fisherman Bay, where it is said fishing-boats may weather the gales at anchor, but it is at times impossible, even here, to make a landing, as the bay is exposed to the open sea. The Dominion Department of Public Works had an engineer at Fisherman Bay with a view to experimenting there with a wharf, but it is doubtful whether anything will be done along that line during the war.

The character of the soil, together with the heavy winter rainfall, makes this an exceedingly expensive portion in which to build wagon-roads. During the period of settlement only six or seven miles of roads have been constructed. During recent years the Government has been constructing foot-trails, as these open up a much larger area for the same expenditure.

The surface of this part of the Island is rolling. There are no high peaks, and the ridges are broken up to a certain extent into isolated knolls. In the portion in which I was working the elevation of none of the knolls exceeded 1,200 feet above sea-level. As the whole district is quite heavily timbered and exposed to the gales from the sea, these knolls are sometimes covered with windfalls on the windward side, which are very disheartening to the luckless traveller who must make his way through them. On a steep hillside they are frequently criss-crossed up to a height of 30 or more feet, with an undergrowth of salal attaining a height of 10 or 12 feet.

Soil.

The soil in general appears to be of good quality. Along Fisherman River extends a level strip of land that may be classed as muskeg. The soil here is only a few inches deep, with a gravelly subsoil, and very wet; during the rainy period these flats are covered with water. The timber, pine, hemlock, and cedar, is comparatively light, making clearing inexpensive. These lands, when cleared and drained, make good hay meadows, but would be of little value for other crops. The remainder of the lowlands have a richer black soil, and when cleared give a good yield. Unfortunately, the land of this character is the most expensive to clear, as there is a heavy growth of red and yellow cedar and hemlock, with a dense undergrowth of salal. The cost of clearing is from $150 to $250 per acre, and is hampered by the damp climate, making burning difficult.

Many of the knolls mentioned cover a large area and the tops of them are nearly level, with a fairly light growth of timber and little undergrowth. The soil appears to be good, which, together with the natural drainage and light clearing, is causing an increasing settlement of

the land of this character. The soil and the climate adapt the country to the growth of hay and vegetables. It would not be practicable to raise grain of any kind.

CLIMATE.

The climate is typical of the west coast; the rainfall is heavy, being about 120 inches per annum. Most of the precipitation is during the winter months, while during July, August, and September the weather, as a rule, is bright and dry. Throughout the year the temperature remains very uniform; the summers are cool and the winters are mild. The snowfall is very light and soon disappears.

TIMBER.

Although the country is heavily timbered, the quality of the timber is poor. Yellow cedar, which is much in demand in the outside markets, grows here, but is so scattered as to make it of little commercial value. Red cedar, spruce, balsam, and hemlock, all of poor quality, are found throughout the district. In connection with the timber must be noted the dense growth of salal; near the shore this forms an almost impenetrable barrier, growing in a tangled mass to a height of 12 feet or more.

GAME.

At the present time there is little game to be found here; there are a very few black bear and a few panther, but during my stay we saw neither. Trout are plentiful in the streams and lakes, and along the Coast is a good halibut bank, affording occupation to a few fishermen.

DEVELOPMENT.

The Government has constructed a wagon-road from Fisherman Bay to Cape Scott, and a wagon-road extends south from Fisherman Bay about three miles along the west boundary of Township 42. This is the extent of the roads. A foot-trail has been built from Fisherman Bay to Shushartie Bay, on the east coast of the Island, and from Fisherman Bay south to San Josef and Sea Otter Cove and to Holberg. The Federal Department of Public Works has during the past year extended its telegraph-lines north to include all of these places, as well as Cape Scott. At Fisherman Bay there are two stores and a post-office; at San Josef there is a store and post-office, and there are post-offices at Sea Otter Cove, Cape Scott, and at Cache Creek.

The steamers on the Coast runs do not come within twenty-five miles of Cape Scott; the C.P.R. boats call twice a month at Holberg, twenty-five miles to the south, and the Union Steamship's line makes Shushartie Bay a port of call weekly. From Shushartie Bay a private launch makes the trip weekly, weather permitting, to Fisherman Bay, charging for freight the same as the freight rate from Vancouver to Shushartie Bay.

VACANT LAND.

This district has for many years been reserved exclusively for pre-emptors, so no land has been disposed of by purchase by the Government. In consequence there are large areas in Townships 41, 42, and 43 still open to pre-emptors.

I have, etc.,

LEROY S. COKELY, B.C.L.S., D.L.S.

FLORES ISLAND.

By H. N. Clague.

December 10th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I have the honour to submit the following report on my work on the west coast of Vancouver Island for the past season:—

I made examinations or surveys of certain lands on Copper Island and the vicinity of Franklin Creek, in the Barclay District; Meares Island, the vicinity of Cypress Bay, and Flores Island, in the Clayoquot District. The bulk of my work being on Flores Island, I propose to confine my report on same.

Mention of the island was made in my report of 1913, but at that time my knowledge of the island was to a certain extent limited. This island, the second largest on the west coast of Vancouver Island, covers an area of some 34,000 acres, and is situate to the north of Clayoquot Sound. In many places the island stretches to within a few chains of the mainland of Vancouver Island. The south and west sides of the island are exposed to the full force of the ocean. There are some good beaches on the south, but the west is very rough and rugged, with no safe boat-landings, excepting near the north-west corner of the island.

The land suitable for settlement is found on the south and west sides of the island, by far the best being on the south. There is a considerable area of swampy land on the west side, and I doubt if this could be used for other than rough grazing purposes without great expense. There appears to be but very little soil in this swampy land, and drainage generally will be difficult.

The soil of the island, taken as a whole, is generally of a gravelly and clayey nature, overlaid in many parts by deep peaty soil.

The climate is mild, and although the rainfall is heavy, most of it falls in the winter months and early spring.

Game is scarce and appears to be getting more so each year. Ducks and geese are plentiful in the autumn. The sea-fishing is good; salmon, cod, and halibut are to be obtained in abundance.

The C.P.R. S.S. "Tees" or S.S. "Princess Maquinna" calls at Ahoussat (near the south-east corner of the island) with mail and supplies bi-monthly in the summer and monthly in the winter. At present there is no wharf at Ahoussat.

In conclusion, I would say that my experience of a number of seasons on the west coast of Vancouver Island has been that the summers are dry, no excessive heat, nights cool, much sunshine.

I have, etc.,
H. N. Clague, B.C.L.S.

TOWNSHIP 4, GRAHAM ISLAND.

By Fred Nash.

Queen Charlotte, B.C., October 19th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I left Masset on July 19th to complete the survey of Township 4, Queen Charlotte Islands District, proceeding with my party by gas-boat to Port Clements, twenty-five miles up Masset Inlet. From Port Clements we crossed to the east coast at Tlell over the "Mexican Tom" Trail, which, owing to the dry season, was in good shape. This trail becomes almost impassable during the wet season, as the creeks which should drain the lower lands are blocked by log-jams, which back up the water over considerable areas. Going south, we found the wagon-road in excellent condition from Tlell to Lawn Hill. This wagon-road, which extends to Skidegate, is twenty-seven miles in length and is the longest continuous road on Graham

Island. At Lawn Hill we connected with the mail-tug from Prince Rupert and reached Queen Charlotte two hours later, making the trip from Masset to Queen Charlotte in twenty-five hours.

In my last year's report I dealt with the physical characteristics of Township 4, and I have nothing further to add relating thereto. In previous reports I have mentioned the mining, agricultural, and industrial possibilities of the Queen Charlotte Islands, and in this report will comment briefly on recent progress.

AGRICULTURE.

Settlers in the different communities have considerably increased the areas under cultivation and crops have been uniformly good. The "South-eastern End of Graham Island" was successful for the third successive year in winning the silver cup offered at the Prince Rupert Exhibition for the best district exhibit of farm produce. This result, obtained in competition with other northern districts of Lakelse, Kitsumgallum, and Terrace, and the extensive district of Fort George, should silence the often-heard statement of pessimists that "Graham Island is nothing but muskeg," and proves that the climate and soil are most suitable for agriculture. It is to be regretted that the settlers of Masset Inlet and the northern portion of Graham Island have not yet arranged annual agricultural exhibitions similar to those which have proved so successful at Lawn Hill and Queen Charlotte.

CATTLE AND SHEEP.

There are now over 500 head of cattle on Graham Island and at the Sand Spit on Moresby Island. Very few of the herd of 250 wild cattle which only a few years ago roamed over the grass lands and sloughs of the north and east coasts now remain. Sheep-raising is still in an experimental stage. A flock of 150 head are doing well on the Sand Spit, and 40 head have recently been turned out near Cape Ball.

Agricultural development in a country mostly timbered is necessarily slow, entailing hard work and plenty of it, but those who have been and are honestly developing their holdings need have no fear of ultimate results.

The weather during the past summer has been excellent, almost too dry from a farmer's point of view. Indian corn and tomatoes ripened in the open, while strawberries produced a second crop.

The frequent visits of Mr. Tomlinson, of the Provincial Department of Agriculture, have been of great service to the settlers, who also benefit greatly from the experiments undertaken at the Provincial Experimental Station at Lawn Hill, in charge of Mr. Richardson.

MINING.

Prospecting in the Yakoun coalfields has not been continued this year. The British Columbia Oil Company, Limited, have been drilling for oil at Tian Point, on the west coast, but up to date no report of finding oil in commercial quantities has been made public. The Ikeda Mines, on Moresby Island, have been shipping ore (copper-gold) regularly during the past year. The South-easter Mine near the Skidegate Indian Reserve is being developed under lease, with promising indications. A continuation of this vein has been discovered on the reserve, and the Indians are doing development-work. Prospecting for placer gold has been undertaken on a small creek one mile and a half south of Masset, and also on black-sand deposit on the east coast.

FISHING.

During the run of spring salmon a large fishing fleet of small boats operated around North (or Langara) Island. Three of the larger gas-boats of Masset Inlet were employed carrying the fish, packed in ice, to the cold-storage plants at Prince Rupert. The halibut fleet has also operated continuously on the banks to the north and west of the islands. The whaling-station at Naden Harbour was also working during the summer months.

LUMBER.

With the exception of two small mills at Port Clements, no mills have been operated during the past season. Although the suummer was drier than usual, no forest fires occurred.

Roads and Trails.

Great improvements have been made on the roads and trails of Graham Island. This year's appropriations have been expended in improving existing roads rather than in extending them. The Nadu, the Woden, and the White River Roads have been gravelled for several miles. Port Clements has been connected up with the Meyer Lake Road. The roads from Tow Hill to Spence Lake and from Skidegate to Tlell have also been put in good repair.

New wharves have been built at Queen Charlotte and Skidegate Indian Reserve by the Dominion Government, and wharves at Masset and Port Clements repaired.

Transportation.

The termination of the mail contract with the Grand Trunk Pacific Steamship Company resulted in the company's service being discontinued, and the small tug-boats which were employed for several months were not suitable for either freight or passengers. The Union Steamship Company's steamer "Camosum" has now taken over the run, making regular fortnightly calls at the Island ports from Vancouver via Prince Rupert.

The War.

The world war has not left the islands untouched. Over fifty settlers have so far gone to the front from Graham Island, several of whom have been killed or wounded.

Settlement.

A few new settlers have come to the islands during the past twelve months, while some of the older settlers have left, probably owing to the increased cost of living, due both to the universal raise in prices and to the increased freight charges during the early summer months, when the tug-boats before mentioned were the only freight-carriers. The excessive cost of wheat had a very detrimental effect on chicken-raising, which promised to be a very profitable industry on the islands.

While settlement and the development of the natural resources of the Queen Charlotte Islands may be retarded by the present "hard times," the islands will eventually "come into their own" and support a thriving agricultural, mining, and industrial population.

I have, etc.,

Fred Nash, B.C.L.S.

SOUTH-EAST OF GRAHAM ISLAND, NEAR SKIDEGATE INLET.

By J. C. A. Long.

Masset, November 12th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I have the honour to submit the following report upon the lands surveyed by me during the past season, being the south-easterly corner of Graham Island, in the vicinity of Skidegate Inlet:—

The work assigned to me was intended to complete the survey of this section of the island by projecting the prior surveys lying to the north and west, southerly and easterly to the Coast. Unfortunately I was not able to complete the work. The area allotted to me to survey lies to the east of Townsite 5 and south of Lots 1851 to 1854. This land is best approached from the east by following the wagon-road connecting Skidegate with Tlell as far as the north boundary of the Skidegate Indian Reserve; thence by the Government trail to the "South-easter" Mineral Claim, which is situated at the south-east corner of my work.

This land consists of a number of benches varying in width up to three-quarters of a mile, separated by the valleys of Miller Creek and of the headwaters of the Tlell River, the former being for the most part a narrow gorge without any considerable amount of bottom land. It is

also cut by several deep ravines of smaller creeks, which give the country as a whole a broken surface. The benches are thus separated from each other in such a way as to render the question of their accessibility from the wagon-road one upon which their future settlement must depend. The altitude of these benches varies from 900 to 1,500 feet above sea-level. The climatic conditions are almost the same as at sea-level, with the exception that heavy mists settle on the bench lands on days that would pass merely as dull days on the sea-shore. During the period that I was in this country there was an almost total absence of frost. On one or two mornings in late September there were slight ground frosts.

Most of the land is heavily timbered with hemlock, mountain-hemlock, cedar, yellow cedar, and spruce. On the bench lands most of the first-growth timber has been damaged by fire and wind. There are several tracts of muskeg, or swamp land, in this area, lightly timbered with yellow cedar, hemlock, and pine, which are free from moss. These appear to have an excellent soil and should be productive.

The soil throughout the timbered area is a yellow clay loam of varying depth, which has been demonstrated to be very fertile.

AGRICULTURE.

Settlement throughout this part of Graham Island has hitherto been confined to the lands adjacent to the sea-shore. In a hilly country such as this is accessibility is of prime importance. Apart from this question, however, several of the lots surveyed by me are well suited for agriculture. They are essentially the same, both as regards soil and climate, as the lands along the water-front, the productiveness of which is best proved by the fact that this district was awarded the cup at the Prince Rupert Agricultural Exhibition for the third consecutive year in open competition with all other districts in Northern British Columbia for the best exhibit of vegetables.

The main obstacle to the agricultural development of these lands—and of all other parts of Graham Island—has hitherto been the lack of market facilities. Owing to the isolated position of the island, the local market has been the only one open to the producer. There is no longer any question as to the productiveness of the land or of the suitability of the climate to produce any ordinary farm crops. One still hears discussions on the productiveness, or otherwise, of "muskeg" lands on Graham Island. Muskegs no doubt vary in quality, as do any other varieties of land. In vindication of them, and of statements I have made in referring to them in previous reports upon the island, I beg to submit that I have obtained results from muskeg land that was drained only three weeks before seeding as good as I have seen from any new land. With drainage, aeration, and cultivation, I am of the opinion that time will prove them to be lands of exceptional fertility.

From the agricultural standpoint, therefore, the situation is, briefly, the land is productive and the climate is good. These two facts alone should be sufficient to determine the agricultural future of the island. The lack of markets for garden-truck can be temporarily obviated by farmers going in for sheep, cattle, or hog-raising, or poultry-farming, in which cases feed-grain must and can be home-grown. Conditions are suitable for stock-raising on lands that can be inexpensively brought under cultivation. I think it is becoming generally recognized at the present time that Graham Island is emerging from the experimental stage, and that discussions on the chemical composition of the ground must give place to digging ditches and of turning the natural richness of the land to some profitable account; and that, as far as the land is concerned, it may be depended upon to do its part.

TIMBER.

The timber of commercial value is chiefly hemlock and yellow cedar; there is some good spruce, though not very much of it. Most of the timber of good size and quality is found on the hillsides and in the creek-valleys. In many parts the yellow cedar alone will scale 8,000 feet per acre and extends over considerable areas.

MINERALS.

This country has been known for a good many years to be rich in minerals. Several claims have been located in the south-easterly portion of this area. The only mine operating is on

the "South-easter" Mineral Claim, in which there are good showings of gold-bearing galena, reported to run to very high values. Most of the work done recently has been to determine the extent of the ore-body.

I have, etc.,
J. C. A. Long, B.C.L.S.

PHOTOGRAPHIC SURVEY IN OKANAGAN VALLEY.

By R. D. McCaw.

November 26th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—The photo-topographical survey of the Okanagan Valley, commenced last year, was continued this season. In my report to you last year a detailed description of the methods used was given. The same instrumental outfit was used again, having been loaned by Dr. Deville, Surveyor-General of Dominion Lands. Last winter the camera was fitted with a new lens and ray filter. An advice was also received from Dr. Deville to use panchromatic instead of isochromatic plates as formerly. The latter plates have been used for many years on this class of work, but are now supplanted by the former, as they are colour-sensitive to all lights. Better results were obtained with the new plates. The detail is sharper and contrasts better marked. Another feature worthy of mention is the black backing which prevents halation. This was absent in the case of the isochromatic plates used, insomuch that many were fogged in the high lights.

As the appropriation at my disposal was limited this past season, I decided to confine operations entirely to the east side of Okanagan Lake, so that I might cover as large an area as possible with less delay by moving, which working on both sides would necessitate. However, several triangulation stations were required on the west side of the lake in order to continue the triangulation of last year and have views looking across toward the east side.

Work was commenced early in July. I left Victoria on July 2nd, and upon arrival at Kelowna began organization, and at the same time erected further signals for the primary triangulation system in the vicinity. The number of men engaged was the same as the previous year—namely, six. The outfit of pack-horses and camp equipment was brought from Penticton, where storage had been arranged for the winter previous.

Triangulations.

The triangulation systems were described in my last report as expanding from a base at Penticton, and there is little to be said in this regard now, as the same procedure of triangulation was followed this year. Readings were taken to several triangulation stations of the Geological Survey of Canada during the summer, and these are incorporated with my "smaller" primary system. The geodetic position of my stations and direction of the meridian correspond except in longitude, where there is a difference of some 18 seconds. The cause of this is not known at present, but is no doubt due to a different origin of longitudes. The matter is being inquired into. Primary station No. 11 of last year was changed to a secondary station. This station had been selected during heavy smoke last year, but was found upon occupation this year to be unsuitable for a primary station; accordingly the change was made. As triangulation and photographic work went on simultaneously, all will be dealt with under the head of "Season's Operations" following.

Season's Operations.

The photographic work was started near Kelowna on July 12th, the time previous being taken up with the erection of new signals. Camera stations were located on two mountains north of Kelowna, known locally as Knox and Dilworth Mountains. These stations were easily reached from Kelowna and served as good stations upon which to break in a new party while organization was not yet complete.

On July 14th the different outfits being complete, the first main camp was located at a point along the Kettle Valley Railway about three miles north of Lequime (Chute) Lake, and work was taken up in this vicinity, where it had been concluded the previous year. The greater part of the move from Kelowna was made over the old tote-road built by the railway contractors for hauling in supplies to their construction camps. Lequime Lake, as I mentioned in my last report, is the largest of a number of small lakes in the vicinity. The country immediately to the north is in the form of a basin, with rolling hills and numerous marshes forming headwaters for several streams flowing northerly towards Okanagan Lake. The timber on the higher land is usually second- or third-growth jack-pine, with some bluffs of fir and spruce. Spruce and balsam timber the highest slopes to the east. Several camera stations were occupied in this locality, and on July 20th a fly camp was moved to a point of access to the primary signal on Okanagan Mountain. The next day this station was occupied for transit readings to the new signals and some of the old ones. I found that the old tower had been struck by lightning and partially shattered. It was repaired and the signal raised some 8 feet in order that it might be clearly visible over the tree-tops from other stations. The same day two camera stations were occupied in the vicinity and a small lake located, which is apparently unknown in the locality. It is a proper mountain lake confined in a narrow canyon with perpendicular sides. The length is about three-quarters of a mile and the average width about 200 feet. There is doubt as to whether it would serve in the capacity of a storage-reservoir as the drainage area is small. The present surface could be raised easily by dams at both ends, and it would probably bear investigation.

A creek locally known as Sawmill Creek was the next base of operations, continuing easterly. This stream heads in two main branches on the west end of the Little White Mountain ridge. Camp was moved to the east side of the main branch on July 23rd. Several camera stations were occupied in the vicinity, and on July 27th a move was again made to the foot of Little White Mountain. This mountain is another of my last year's primary stations. A very good trail leads up to the top on the north side. Since I had been on this mountain last season a new signal by the Geological Survey of Canada had been erected on the site of my old one. Also the Forestry Branch of this Province had constructed a cabin for the convenience of the Fire Ranger stationed there for the summer season. New transit readings were taken to some of the old signals, as well as the new ones erected a few weeks prior. A new camera station was occupied at the east end of the ridge, from which a good view of the Hydraulic Creek country is obtained, dotted with lakes.

From Little White Mountain camera stations were carried down the first main tributary of Mission Creek from the south—namely, Canyon Creek (local name). This stream has two branches and bears its name well. The Kettle Valley Railway winds about the sides of the canyon over high trestles, heavy rock-cuts, and through tunnels, which show up the engineering difficulties. Some good views were obtained showing the railway in its numerous windings. At the head of the east branch of the creek is a storage-reservoir of the Kelowna Land and Orchard Company, and by means of a ditch the water from a small lake at the east end of the Little White Mountain ridge has been diverted into this reservoir. The lake, known locally as the K.L.O. Lake, formerly drained towards the Kettle River Valley. The former site of the reservoir was also on the Kettle River side of the divide, so that really the whole system is diverted into Canyon Creek by means of ditches and dams. The overflow from the reservoir still follows the original watercourse towards the Kettle Valley. Part of this overflow is again diverted farther on into Hydraulic Creek. Usually the upper part of Canyon Creek is heavily timbered with large spruce apparently untouched by fire. Balsam and jack-pine is intermingled with the spruce, as well as much windfall.

Hydraulic Creek and Summit was the next base of operations. This stream is the next tributary of Mission Creek easterly. The summit or pass is at an altitude of about 4,100 feet above sea-level and conveys the Kettle Valley Railway from the Okanagan Lake to the Kettle River Valley. For the most part the surrounding country is in the form of a large basin, with low rolling hills. Many lakes and marshes differing but little in elevation are dotted throughout. This basin contains the storage-reservoir of the South Kelowna Land Company, and when filled to capacity is probably the largest storage-reservoir in the Kelowna District. Water is diverted into the main reservoir from lakes near, by means of retention-dams and ditches. The timber in the vicinity is jack-pine for the most part in all varieties of density, sometimes park-

like, and again small and so thick that it is almost impossible to penetrate. On account of the flat topographical featuring of the summit, other methods were employed for getting the topography, in conjunction with the triangulation and camera work. Compass and barometer were used upon old survey-lines, as many had been run by the engineers in locating the reservoir-site. Land-lines and the railway location were also used. Near McCulloch, the summit station of the Kettle Valley Railway, we found one rancher who was growing hay and a few vegetables at that high altitude.

KETTLE VALLEY RAILWAY.

So far but casual mention has been made of the Kettle Valley Railway, and as it is not touched again after leaving the Hydraulic Summit it might be well to mention it here. From Lequime (Chute) Lake to the station at McCulloch the grade rises from about 4,000 to a little over 4,100 feet. It is practically a level road-bed skirting around the ends of ridges and running back into the ravines of different creeks in order to maintain the elevation. The actual distance between the two points just mentioned is about eighteen miles, whereas the distance traversed by the railway is about thirty-one miles. There are two main creeks crossed in this distance, Sawmill and Canyon (local names), by means of high wooden trestles built on rather sharp curves, and from 110 to 175 feet above the stream-bed. In addition there are many other smaller trestles over less important watercourses and dry gulches. The timber along the line consists of fir and tamarack, with the usual jack-pine, the latter predominating towards the Hydraulic Summit. The bluffs left above rock-cuts gave very good camera stations in some instances, and the right-of-way was very convenient for going to and from camp.

On August 11th a camp was located on Mission Creek about sixteen miles east of Kelowna. The move over from the Hydraulic Summit was made partly by wagon-road constructed a number of years ago by the South Kelowna Land Company, and partly by trail. The road mentioned is well graded and is used a great deal by holiday people in going to the lakes at the Hydraulic Summit for fishing. Automobiles get over the road easily.

MISSION CREEK.

Mission Creek is one of the main streams of the Okanagan Valley, and at flood-time is a veritable river. At the present moment I am unable to give the length, but it is approximately thirty-five miles. For many miles of its length the bed is composed of boulders, gravel, and sand, with wide bars and free from vegetation. The grade is fairly gradual, with several small waterfalls. In parts the width from bank to bank (at flood) would be 200 feet, while ordinarily the width of the stream would average 25 to 50 feet. There are five main tributaries to the main stream above the Hydraulic Creek junction—Eight-mile Creek (local name), the North Fork, Rich Creek, Middle Fork, and South Fork. The first two flow in from the north, while the latter two join from the south and east. A good Government road extends up the Mission Creek Valley as far as the North Fork. A road constructed by the Belgo-Canadian Company extends from this northerly along the North Fork to their reservoir-site some ten or twelve miles north. The grade of this road is particularly even and is easily passable for motor-cars.

The first camera stations were occupied in the vicinity of Eight-mile Creek, which heads in a large plateau to the north. The Black Mountain Water Company has a small reservoir for domestic use on the lower portion of this stream near the main road.

Triangulations and camera-work were continued up the South Fork, past Rich Creek, this last-named stream being left until later. During August 15th, 16th, and 17th there was more or less rain in the vicinity, accompanied by heavy thunder and lightning, insomuch that trees were struck and ignited in the locality and the air soon became smoky. However, we lost but one day from this cause, as more rain put the fires out. On the 19th I made a reconnaissance trip to the east in order to find out where the main divide was situated and to locate a trail for moving camp. An old trail was followed easterly over the Kettle River Divide, and, as it was very steep in parts and badly filled up with windfalls, a circle was made to the north in order to see if there was a trail up the main branch of the South Fork. However, none was found, and I decided to clear out the old trail to the divide and there cut a new trail (where necessary) through an old burn northerly towards the Mission Plateau. The old trail was cut years ago as a means of travelling from Kelowna to the Upper Kettle River country, which

was then a famous game resort, and is yet to a large extent, although the large herds of caribou are now extinct.

The next day the camp was shifted to the edge of Mission Plateau, the trail being cleared out where necessary by a few men in advance. The move was a long, tedious one, and the worst during the whole summer. Primary station No. 12 was occupied from this camp and one or two other camera stations along the Kettle River Divide before moving farther east to the middle of the plateau.

MISSION PLATEAU.

The Mission Plateau is an area of gently undulating land, with a few slowly rising prominences. The headwaters of the South and Main Forks of Mission Creek are situated here in the form of lakes and marshes, of which there are a large number, with myriads of small streams. A large fire swept portions of the plateau years ago, and there are areas almost open, and again areas of standing dead timber. The green timber consists mainly of spruce and balsam, with some jack-pine. The parts left by the fire are usually of park-like character, and it is a very pleasing country to travel through. The Water Rights Branch some years ago located a number of storage-reservoirs in the vicinity of Fish Hawk Lake, the headwaters of one of the branches of the main stream. To the south of this there are several other possibilities for storage-reservoirs, generally in the form of meadows. These have not as yet been investigated. To the north of Fish Hawk Lake, which is outside the area covered this year, the country seems to be thickly timbered, with two bare knobs rising probably on the divide at the headwaters of the main branch of Mission Creek. The altitude of the plateau ranges from about 5,700 to 7,000 feet, the exact elevations not being calculated at the present time.

Rich Creek was the next base of operations and triangulation, and camera-work was started there about September 1st. One delay after another occurred here from rain and smoke. As already mentioned, Rich Creek is a tributary of Mission Creek and heads in the Kettle River Divide east of the Hydraulic Summit. A year ago a forest fire damaged the easterly watershed to a large extent and burned so low that neighbouring farms were endangered.

The North Fork of Mission Creek has its source in a large undulating basin some ten miles north of the junction. The Belgo-Canadian Reservoir is situated in the basin, while the irrigation-ditch leaves the creek about six or seven miles down-stream. This ditch follows closely the contour of the slope on the west side of Mission Creek to Black Mountain, where it enters a long siphon. Where it is found impractical to dig a ditch the water is conveyed in a semicircular stave flume supported on trestles. The whole is of splendid construction. Again, when the soil is sandy and there is likely to be a great deal of leakage, the ditch has been lined with concrete. Camera stations were occupied up the North Fork as far as the reservoir. On account of the flat character of the country above the reservoir it would be necessary to extend camera and topographic work into the upper parts of Coldstream Creek and Kelowna (Mill) Creek, but the time at my disposal would not permit of this, as we had lost a good many days in September already from rain and smoke. This leaves a small portion of the Mission watershed unfinished which should be done in connection with the watersheds of Coldstream Creek and Kelowna (Mill) Creek.

On September 13th camp was moved down to Eight-mile Creek (a tributary of Mission Creek near Black Mountain) to complete some instrumental readings on two primary stations in the vicinity. Rain again delayed matters, which, with smoke drifting in later, gave a very hazy landscape for either views or readings on signals. However, we had to make the best of it, although some of the views obtained would be poor.

A week later we moved across the lake to complete the triangulation and camera-work near the lake-shore on that side. Smoke and rain greatly impeded operations, and it was with difficulty camera views were obtained. Four stations were occupied on this side, one of them being attempted three times before views good enough could be taken.

Camp was broken up on September 29th, and all paid off but the packer, whom I retained to accompany me to the top of Little White Mountain, as I had some transit readings to complete up there. This done, I arranged for the storage of outfits and wintering of horses, and after spending one day obtaining information from the different irrigation companies concerning their reservoirs and systems, left for Victoria on October 5th.

Actual work in the field was carried on from July 5th to October 2nd, during which time the following stations were used:—

Primary triangulation stations 5
Secondary triangulation stations 9
Photographic stations 64

The total number of camera stations as grouped about a main station is about 125. In addition, several ties were made to land-survey posts and to the location of the Kettle Valley Railway, also short traverses were run as a reference base for noting topography where the country could not be covered by photographs. This latter applies more particularly to the Mission Plateau. Topography where camera-work was unsuitable was gathered by my chief assistant, T. Rognaas, C.E.

Climatic Conditions.

The climatic conditions of the past season are worthy of note. The previous winter gave a very light snowfall. The result of this in the early spring was rather discouraging to the different irrigation companies and private individuals dependent upon irrigation. Spring rains were heavy and occurred often, so that this condition was overcome. Rain continued at intervals until near the end of July, not in the form of mere showers, but heavy downpours. Irrigation was practically not needed until well on in the summer, something unheard of before in the locality. Again the rain was accompanied almost in every instance with thunder and lightning. These conditions were a distinct contrast to those of the previous summer. Vegetation did not dry up until late, and as a result there were but few forest fires, and any that did occur were small and easily controlled. Notwithstanding the few fires in the Okanagan Valley, the smoke nuisance gave us many delays in September. The smoke apparently drifted in from fires at the Coast or south of the International Boundary. Rain occurred at intervals during September, after a very dry and hot month of August.

General.

A written description of the topography is hardly necessary, as the finished map will portray this. The two main valleys are those of Mission and Kelowna (Mill) Creeks, which almost unite in the low, flat lands east of Kelowna. Mission Creek at high water floods a considerable area in the vicinity, and a portion runs into Kelowna Creek. There is much open grass land on the lower slopes, and in the vicinity of Black Mountain are some splendid stock-ranges. Bull-pine, with some yellow pine, is the chief timber-growth on the lower slopes. A few scattered fir are found, increasing in number higher up. A great deal of tamarack occurs in the vicinity of the 4,000-foot contour. Above this the usual jack-pine, spruce, and balsam is found. Cedar is found in most of the creek-bottoms up to a high altitude and is of good diameter.

Kelowna is the main centre of the country mapped this year. The country immediately surrounding is very low, being but a few feet above lake-level, so very low that drainage is a difficulty. Farther east the benches begin similar to those close to the lake in other parts of the Okanagan Valley. Nearly all kinds of fruit grow in abundance in this locality. All do well with the exception of peaches, which do not do quite as well as farther south. Kelowna probably specializes in apples, if I may use the term. All vegetation was a luxurious growth this year owing to the rain, and, as I mentioned before, little irrigation was needed until well on in the season. Vegetables in some instances could hardly be disposed of.

Game.

The game in this part of the country is very similar to that covered last year. Mule-deer are rather scarce near the settled areas, but farther east in the Mission Plateau there are a great many. One day in this part seven were seen by one member of the party. Grizzlies and silver-tips are also numerous at the headwaters of Mission Creek. Two were seen during the week we were camped there. Blue and willow grouse are very common, and the streams are full of brook-trout. The lakes at the Hydraulic Summit are well known for their large trout, as also other lakes in the higher altitudes.

The result of the season's work is being laid down upon a map, drawn to the natural scale of 1:40,000, with contour intervals at 100 feet. Land-ties and triangulations are shown upon a separate sheet.

I have, etc.,
R. D. McCaw, B.C.L.S.

SURVEY OF THE BOUNDARY BETWEEN THE PROVINCES OF ALBERTA AND BRITISH COLUMBIA.

By Arthur O. Wheeler.

December 24th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—At a meeting of the heads of the Survey Departments of the several Governments interested, held at Edmonton at the end of May, it was decided that the representative of the Province of Alberta could equally well represent the Dominion, seeing that their interests were identical. In consequence, J. N. Wallace, the Dominion representative, did not take part in the work of the Commission subsequent to the said meeting. Later an Order in Council was passed appointing R. W. Cautley the representative of the Dominion as well as of Alberta. Otherwise the work of the Commission was carried on as in previous years. R. W. Cautley, D.L. and A.L.S., was in charge of the survey of the boundary and of monumenting in the passes; A. O. Wheeler, D.L. and B.C.L.S., was in charge of the topographical survey of the watershed and of monumenting where brass bolts were set in the rock near or above the timber-line. The position of all established boundary-lines and of the monuments between them were mutually agreed upon by the Commissioners.

Topographical Division.

The work of the topographical division is for the most part carried on by the method of photo-topography; it was, therefore, first necessary to test the survey camera and other instruments and to ascertain the speed of the plates used for the purpose. This was done at Banff, where conditions are exceptionally well suited to such work, during the latter part of June. The camera, mountain transit, and other special instruments in use were, as in other years, kindly loaned to the Commission by Dr. E. Deville, Surveyor-General of Dominion Lands.

The surveys of four passes were completed—viz., Akamina Pass, North Fork Pass, Dome Pass, and Elk River Pass. Three of these passes are situated at long distances apart and necessitated much cutting-out of old trails, now littered by windfall, and of new trails, in order to get from one to the other and to carry on the survey of the watershed-line between them.

On June 30th the party left for Pincher Station, on the Canadian Pacific Railway (southern route), and from there proceeded south by pack-train, following the main road to Akamina Pass.

Akamina Pass.

Akamina Pass over the continental watershed is situated one mile and three-quarters north of the International Boundary. It is clad with a heavy growth of pine, spruce, and fir at lower levels; near timber-line Lyall's larch is seen. The more level portion of the pass between the bounding steep hillsides is a little less than one mile and a half in width, and the distance between the crests of the containing mountain ridges is approximately three miles. The altitude is 5,800 feet, plus, above sea-level. On the south side the pass is bounded by a precipitous rock wall from which a very striking narrow rock ridge stands out like a giants' causeway. Up this the watershed-line ascends to the crest of the rock wall, and shortly after crosses the International Boundary. At the International Boundary a tie was made with Monument No. 272, which has been placed at the spot where the Provincial Boundary crosses it.

Directly below the wall, on the east side of the causeway, is Cameron Lake, a picturesque sheet of water one mile and a half long by half a mile wide. Two other small lakes, the larger of which, Wall Lake, is well stocked with trout, lie close by on the west side of the watershed.

A good wagon-road from the prairies traverses Akamina Pass and leads down the valleys of Akamina and Kishinena Creeks to the Flathead River Valley in the United States. This road is of importance, for it is the only wagon-road crossing the continental divide south of that through Tent Mountain Pass, which is some fifty miles distant as the crow flies. It has been used chiefly in connection with oil prospects on both sides of the divide. During the past summer the work of boring for oil was discontinued at the prospect on Akamina Creek, but was again carried on at Oil City on the east side, where work had been discontinued owing to the drilling apparatus having broken in the bore.

Seven concrete monuments were erected at suitable points across the pass by Mr. Cautley's division, and four brass bolts with rock cairns built over them were placed by the topographical division.

South Kootenay Pass.

From Akamina Pass the topographical survey of the watershed was carried north-westerly to connect with that of the previous year where it had been terminated south of Middle Kootenay Pass. When doing this the South Kootenay Pass was definitely located. It is approximately ten miles north of the International Boundary, measured along the watershed-line, and is nearly 7,000 feet in altitude. More a crossing over the divide than a pass of practical economic value, it consists of a low dip between high points of the transcontinental ridge, with steep approaches on both sides, and is sparsely timbered at the summit.

The pass was traversed from west to east and reported upon by Captain Blakiston, of Palliser's expedition, in 1858. He probably travelled by this route, because an Indian trail at that time furnished a line of travel across it from the plains of Alberta to the Kootenay Valley. It is shown on Palliser's map as Boundary Pass, and it would appear from Captain Blakiston's report that Akamina Pass was unknown to him. The stream from it on the west side is Kishinena Creek, and on the east side the South Branch of Blakiston Brook.

Owing to the steepness of the approaches to the summit from either side and the unlikelihood of its being of economic utility in the near future, your Commissioners did not consider that the expense of a special survey would be warranted.

Beyond the South Kootenay Pass, on the west side of the divide, lies the basin of the headwaters of Sage Creek. Prospects for oil have been made in the valley of this stream, but are not now being prosecuted with much vigour. Access to them is obtained by road and trail from the Flathead Valley.

The section of the Rocky Mountains above referred to is largely composed of reddish-brown sandstones and conglomerates; the peaks and ridges present wonderful towers and turrets, and in some cases their crests have been carved into unique and striking shapes; where bold, precipitous rock-faces are exposed, the strata are seen to be much contorted.

Seventeen stations were occupied by the camera and transit in order to close the survey with that of last season, thus completing the location of the watershed from the International Boundary north to the Canadian Pacific Railway through the Crowsnest Pass.

North Fork and Dome Passes.

Having completed the above work, the party started for Crowsnest on July 25th, and travelled down the South Branch of Southfork River—renamed Castle River by the Geographic Board—to the outside foot-hills of the prairies, then by an inner trail to Hillcrest, on the Canadian Pacific Railway, and by wagon-road to Crowsnest, arriving there on July 27th.

Work was now extended northward between Crowsnest Pass, of which the survey had been completed the previous year, and North Fork Pass. The location of the watershed across the small pass immediately north of Crowsnest Pass, through which the main road from the Alberta prairies to Fernie runs, is still a matter of disagreement between the Commissioners, so no action was taken in connection therewith. It has been fully reported upon.

From the source of Elk River in Elk Lakes the course of the stream, generally speaking, parallels the watershed, gradually diverging therefrom. A good wagon-road has been constructed up the Elk Valley from Fernie for about two-thirds of the distance to its head. From the end of the road a pack-trail leads to the pass between the headwaters of the Elk and Kananaskis Rivers, which is here referred to as Elk Pass. The Grain Belt Construction and Development Company has located a line of railway from Calgary in Alberta to Fernie in British Columbia, which crosses the Elk Pass and follows the general course of the trail and road down Elk Valley on its east side.

All this section of country on the west side of the divide, and on the east side between the High Rock and the Highwood and Livingstone Ranges, is underlaid by coal, towards the development of which much prospecting has been done on the west side of the divide in the Elk and tributary valleys. At intervals, camps with good log bunk-houses have been built along the road and in the side-valleys extending towards the crest of the main range. Caretakers are

in charge of the camps, and their use as shelters is open to such travellers as may be on the move. This is a very great boon and one of which we were glad to take advantage; it speaks well for the courtesy and consideration of the company owning them.

The Elk Valley presents a broad, fertile trough, originally well timbered, but with much open meadow land intermingled. A large proportion of the timber has been killed by forest fires. The river practically forms the boundary between the cretaceous or coal-bearing area and the limestone series, and almost directly from its western bank rises the bold escarpment of a range of limestone peaks. On the east side the slopes of the valley rise to ridges of high sandstone and shale hills, cut at intervals by glacial torrents flowing from the snows of the High Rock Range.

Between these ridges and the watershed range lies a minor trough also paralleling it, comprising the valleys of Alexander Creek, Fording River, and their tributaries. A road from Crowsnest leads up Alexander Creek to its forks, and then up each fork to camps where coal-prospecting has been carried on to a considerable extent. From the end of the road up the West Fork a much-disused trail, in places almost obliterated, leads to Fording River, follows the same to its source, and then, by Aldridge Creek, to the Elk Valley Road.

The inside line of travel suited our work well, as it enabled us to keep close to the continental watershed along the crest of the High Rock Range. Instead of following the West Fork of Alexander Creek, we followed the East Fork, where there certainly had been some travel, but a trail could hardly be said to exist. Mr. Cautley's party had preceded us, and, in consequence, we found a track cut out which enabled us to carry on our work without loss of time.

Stations were occupied at the head of Alexander Creek and on the Erickson Ridge, and then Mr. Cautley's blazed trail was followed across the divide between Alexander and Line Creeks, and to the headwaters of the latter on the west side of a pass directly below the mountain known as Gould's Dome.

The country is a network of intersecting valleys, and, in an endeavour to locate North Fork Pass, Mr. Cautley had gone beyond it and arrived at an unnamed pass, above referred to, which we have designated "Dome Pass." He had commenced work there under the impression that it was North Fork Pass, about six miles north of which it lies. The approach to North Fork Pass from the Alberta side is by way of Dutch Creek, which heads respectively in that pass and Dome Pass. A fairly good trail leads up to the summit of North Fork Pass, but on the west side it was found littered by windfall and not very distinct, and there is little wonder it had been overlooked in the search for the pass on the west side of the divide. An indistinct hunting-trail also leads over Dome Pass.

After consultation, the Commissioners decided that it would be advisable to complete the survey and monumenting of Dome Pass, for the reason that the approaches on both sides are good and it may prove a serviceable route for a road, while the approach to North Fork Pass from the east is very steep. The Interprovincial Boundary, therefore, was established across both passes and a tie made with the Dominion lands system of township surveys on the east side of the divide.

In North Fork Pass, which is a narrow defile with no level bottom land and timbered throughout except for a small dry meadow on the western slope, three concrete monuments were erected, and four brass bolts with rock cairns over them were placed at prominent points on the containing mountain-slopes. The altitude of the pass above sea-level is 6,500 feet, plus, and the distance from crest to crest approximately two miles.

Dome Pass is of a delightfully alpine character, with open grass lands and groves of spruce on both sides of it. A narrow flat marks the pathway of the pass, and then steep slopes rise abruptly to towering precipices and crags of rock. It is a veritable gateway through the High Rock Range, and at first glance would seem to be barred to further progress on the north side by encircling ramparts and fortifications. With the exception of Simpson Pass, I know of none that is more charmingly picturesque or more grandly impressive in its surroundings. Directly on the east side rises Gould's Dome. It is the supreme peak of the High Rock Range, 10,169 feet in altitude. There seems to be some misunderstanding about the proper application of the name, for Dr. G. E. Dawson, in his map published in 1886, places it upon a more southern peak close by; but there is no doubt the peak referred to by Captain Blakiston when he first conferred

the name is the one immediately east of the pass. The mountain is a storm centre for the locality, and on the occasions of our two ascents we had narrow escapes through a cloudburst and a severe electrical storm.

Three concrete monuments were here erected, and three brass bolts with cairns were placed. The altitude of the pass summit is 7,090 feet above sea-level. From crest to crest the valley is approximately a mile and a quarter wide. To carry the location of the watershed-line from Crowsnest Pass to Dome Pass nineteen stations were occupied by the topographical division with camera and transit.

DOME PASS TO ELK PASS.

August 24th to September 26th was spent in locating the boundary along the watershed in a northerly direction towards Elk Pass, travelling over the summit from Line Creek to Ewin Creek, and down the same to the old pack-trail up Fording River. The Fording Valley is well timbered with pine and spruce, and many charming little meadows were seen where the grass is knee-high, and excellent food for horses is found. The trail winds alternately through these and through the woods along the east side of the river.

Fording River flows in a trough through the middle of the cretaceous area. On both sides are high sandstone and shale ridges, with coal showing in many places. Through the ridges on the east side many snow-fed streams from the High Rock Range have cut deep valleys—Todhunter Creek, Chauncey Creek, Kilmarnock Creek, Clode Creek, Henretta Creek, and smaller ones without names. These valleys were utilized to approach the watershed and gather information to enable its location to be mapped.

On September 7th the first snow fell, and from then on the weather was very bad, snow falling frequently. In consequence, much time was lost owing to the impossibility of getting the photographs from which the maps are made.

On September 18th I visited Mr. Cautley, who was now working at the Elk Pass, and in conjunction with him went over his preliminary survey, and we agreed upon the location of the boundary and the points where concrete monuments should be placed.

On the 27th, finding it impossible under existing weather conditions to complete the location of the watershed-line beyond the head of Fording River, the party crossed the summit to Aldridge Creek and followed the trail down that stream to the Elk Valley Road, and thence by road and trail to Elk Pass, where the topographical division was required to enable the survey of this pass to be completed.

Twenty-one stations were occupied to carry the location of the boundary from Dome Pass to where the work was discontinued.

ELK PASS.

Elk Pass separates the waters flowing to the Pacific by way of Elk River and to the Arctic by way of the Kananaskis River. It is of a somewhat peculiar formation and is divided into two passages by a low, heavily timbered ridge. Both have muskeg bottoms, and the whole pass is marshy between the low ridges by which it is traversed. From those two passages Canyon Creek on the west and Tobermory Creek on the east unite to form the headwaters of Elk River, which stream derives its main supply from two small lakes fed by the glacial torrents of a large snow-bound amphitheatre in which they lie. On the other side Boulton Creek from the eastern and an unnamed stream from the western passage unite and flow to Lower Kananaskis Lake, which, with Upper Kananaskis Lake, forms the main source of the river of the same name. The pack-trail, such as it is, follows the western passage. Trial lines for location of the Grain Belt Construction and Development Company's railway have been surveyed through both passages.

Beyond the two passages, which for convenience are referred to respectively as east and west Elk Pass, long timbered slopes rise to the high limestone peaks of the Elk Mountains on the east side and of the Kananaskis Range on the west side. The bottom and more level portion of the pass summit is approximately two miles wide, but more nearly three as the watershed winds. From crest to crest of the containing limestone ridges the distance is approximately four miles and a half as the crow flies.

Thirteen concrete monuments were erected by Mr. Cautley's division, and three brass bolts and cairns were placed by the topographical division. Six stations have been occupied with

camera and transit to gather information to map the pass. In all, for the season, fifty-nine stations were occupied and 364 photographic views were taken with the survey camera for mapping purposes.

On October 2nd the party started for Banff by way of the Kananaskis and Spray Lakes Trail, and, arriving there on the 6th, was paid off the following day. Mr. Cautley closed his field-work some days later.

GENERAL.

From Crowsnest Pass to the north boundary of the Crowsnest Forest Reserve, situated on the east side of the continental divide, collaboration with M. P. Bridgland, D.L.S., who had made a photographic survey of the reserve, rendered a further survey for that side unnecessary. North of the reserve information had to be obtained for both sides.

All this section is of great future value owing to the enormous deposits of coal that underlie the surface. Coal crops out at the crests of nearly all the ridges, and very considerable prospecting has been done, with abundant results. When a railway down the Elk Valley is in running order, a large industry in this direction should be developed.

Settlement in the Elk Valley above Michel has begun, and a number of ranches and farms were seen from the hill-tops. Considerable valuable timber was noted along our route up the inside trough near the High Rock Range and in the tributary valleys, also in the valley of Fording River. In the Upper Elk Valley large tracts of green timber were seen, but it is to be regretted that much of it has been burned over and now presents barren tracts of dry sticks. McInnis's mill at the mouth of Alexander Creek was in operation, and I am told that the mills in the Michel-Fernie District are again at work, a demand for lumber having probably been created owing to last summer's enormous wheat-crops on the Western Prairies. There seems every probability that the proposed railway down the Elk Valley will, when constructed, open up a valuable tract of country.

GAME.

The country abounds in game. Rocky Mountain goats are seen on all high peaks from the International Boundary north. Mountain-sheep, the big-horn, were seen on the Erickson Ridge and on the slopes surrounding Gould's Dome, and are doubtless to be found in many other places in the vicinity. Red deer, black and white tail, are in all the woods and on the slopes high up. In the Fording River Valley elk are very numerous and many were seen; their trails are everywhere there. Bears were not often seen, but when snow fell their presence was very apparent by their tracks. Fresh beaver cutting was noted in the Elk Valley. Rabbits and small fur-bearing mammals were not often seen, but the first fall of snow showed them to be very plentiful. Throughout the woodland grouse were much in evidence, and high up near the snow ptarmigan were frequently seen.

In Wall Lake, near Akamina Pass, there is excellent trout-fishing. In Blakiston Brook and Castle River there is a large supply, and fish were caught up to 6 lb. in weight. There are also trout in Elk River, but the supply and size did not appear to be great.

SURVEY RETURNS.

Full reports and maps are now being prepared by the respective divisions of the Interprovincial Boundary Commission.

I have, etc.

ARTHUR O. WHEELER, B.C.L.S.,
Commissioner for British Columbia.

EXPLORATORY SURVEY NORTH OF THE PEACE RIVER BLOCK.

By G. B. Milligan.

May 28th, 1915.

G. H. Dawson, Esq.,
Surveyor-General, Victoria, B.C.

Sir,—I have the honour to submit the following general report of my operations in the Peace River District for the seasons 1913 and 1914:—

Instructions issued to me on May 3rd, 1913, required a thorough exploration of that portion of the above district lying north of the Dominion Block, and more particularly to the eastern portion of this area, and, in addition to geographical data, to collect any information that might be of value relative to that district. The trip to extend over two seasons and the intervening winter.

When referring to the country under review, although it is part of the Peace River District of British Columbia, it may be confused with what is popularly called the Peace River country, about which so much has been said and written. The Peace River country is generally understood to be that territory adjacent to the Peace River in British Columbia and to a greater extent in Alberta. This country has been more or less thoroughly explored and partly surveyed and is now being rapidly settled up. The country explored during the last two seasons is more generally known as the Fort Nelson country, the name being taken from the Hudson's Bay Company's post on the river of that name which drains this region.

The Fort Nelson country, owing probably to its inaccessibility and remoteness from the main lines of travel, has hitherto received but scant attention from explorers and travellers. In 1891 William Ogilvie, D.L.S., received instructions from the Surveyor-General at Ottawa to make an exploration of the region drained by the Peace River and its tributaries between the boundaries of British Columbia and the Rocky Mountains. As it was desirable that he should, if practicable, connect the end of his micrometer survey of the Mackenzie River, made in 1888, with that made on the Great Slave River in the same year, which he was then unable to accomplish on account of high water, Mr. Ogilvie took with him the necessary instruments, but found it impossible to complete this work. He descended the Mackenzie River from Athabaska to Fort Simpson, and, ascending the Liard and East Branch, or Fort Nelson River as it is now called, reached Fort Nelson on September 15th, ascending the Fort Nelson and Sikanni Rivers, and leaving the latter at a point two miles below where it turns sharply to the west, struck southeast through the woods to St. John, on the Peace River, where he arrived on October 21st.

Seven years later, in 1898, some of the Klondikers, seeking an overland route to the Yukon, travelled easterly with horses through Fort Nelson, coming from points on the Peace River, but, as far as I am aware, only fragmentary and unreliable information is available as a result of this. Still more recently, and until 1913, the Treaty party of the Indian Department each summer made a trip across country from St. John to Fort Nelson. They usually took horses over the trail as far as the Sikanni River and then travelled by canoe down-stream to Fort Nelson, returning the same way. Such considerable delay, however, was experienced each trip, owing to the amount of fallen timber, that this route has been abandoned, and they now reach Fort Nelson from the north by way of Fort Simpson up the Liard and Fort Nelson Rivers.

Routes to the Peace River.

In contemplating the preliminary arrangements for the trip, the first thing considered was the best means of access to the country. It was decided that Fort St. John, in the Peace River Block, was to be the starting-point, and to reach which, from Victoria, there were two alternative routes. One was by way of Fort George to Giscome Portage, and then by canoe downstream to the Peace River, and the other via Edmonton. The former, although quicker and more direct, was abandoned in favour of the Edmonton route, as from this point our outfit and supplies could more conveniently be shipped to St. John, and it was thought that information about the country we were to travel could be obtained from the Hudson's Bay officials and others east of the mountains. In this connection I might mention that Fort Nelson post is included in the Mackenzie District of the Hudson's Bay Company's trading-posts, with head

district office at Fort Smith; therefore very little information could be obtained at Edmonton or elsewhere, the company's officials not being in touch with the conditions prevailing at Fort Nelson, and, indeed, at one point we were informed that the post at Fort Nelson was abandoned, so that, with this in mind, arrangements were made at Edmonton to take our supplies and what outfit was required with us to last the two years. We discovered later that this was not necessary, as supplies could have been sent in with the Hudson's Bay transports which arrive at Fort Nelson, via the Mackenzie River, about the beginning of August. These transports, which bring up the year's trading outfit, are tracked up the Liard and Fort Nelson Rivers 400 miles from Fort Simpson, on the Mackenzie River, to the Fort Nelson post. The cost of bringing supplies this way from Edmonton is estimated at 22 or 23 cents a pound. It is understood that in future power-boats will be used on these rivers, which will do much to facilitate travel and reduce freight rates.

Accompanied by Mr. Cartwright, who is submitting a report to the Agricultural Department, I left Victoria on May 9th, 1913, and proceeded to Edmonton, where arrangements were made for obtaining our outfit and supplies for the two seasons. From Edmonton we travelled by the Canadian Northern Railway to Athabaska Landing, which until recently has been the distributing-point for supplies going north to the Mackenzie River District, and also westerly to the Peace River. However, with the completion of the Edmonton, Dunvegan & British Columbia Railway this year, the distributary point will be advanced to Peace River Crossing, and supplies for the Mackenzie District will go by steamers down the Peace and Slave Rivers, thus avoiding the Grand Rapids on the Athabaska, which hitherto have always been a hindrance to navigation to the Mackenzie District. The Upper Peace River country, also, and the country generally adjacent to and east of the Rockies will, until the railway's further progress, be probably supplied from Peace River Crossing.

From Athabaska Landing we proceeded by steamer up the Athabaska River to Mirror Landing; thence across sixteen miles of portage to Lesser Slave River, where we again took steamer across Lesser Slave Lake to Grouard; thence eighty miles by wagon-road to Peace River Crossing, and from there by steamboat by the Peace River to Fort St. John. The steamer runs up-stream as far as the growing settlement of Hudson Hope, which is the head of navigation. Our horses were obtained here, having been wintered out along the slopes on the north side of Peace River.

FORT ST. JOHN.

At Fort St. John there are two well-stocked stores, Revillon Frères and the Hudson's Bay Company. The headquarters of the Provincial police are also located here. It is expected that the Dominion Government Telegraph Line will be completed to St. John this year and will shortly be extended to Hudson Hope. The land in the vicinity of St. John, and particularly on the plateau to the north, is being rapidly taken up. There are fifty or sixty settlers already on the ground, several of whom last summer, besides growing the ordinary vegetables, ripened patches of wheat and barley.

GOOD LAND IN THE DOMINION BLOCK.

On the plateau north of St. John, included within the Peace River Block, are extensive areas of excellent land, and in comparison with the country travelled farther north no areas were encountered to equal this in desirability from an agricultural point of view. This tract (elevation about 2,200 feet) is a gently undulating plateau, through which the valleys of the North Pine and its tributaries have been excavated. There are large areas of prairie country either perfectly open and covered with a luxurious growth of peavine and grasses, or dotted with patches of small poplar and willow. The rank growth found on this bench land is astonishing, and several samples of peavine collected here measured 8 to 9 feet in length.

EXTENT OF COUNTRY TRAVELLED.

North of the Dominion Block the area of country mapped and explored and dealt with in this report comprises roughly 18,000 square miles, extending north to approximate latitude 59° 15′, and included between the easterly boundary of the Province and the foot-hills of the Rockies. In stating that this area was mapped and explored, it is not to be understood that every part was actually visited, and there will no doubt be isolated patches of good land here

and there not coming within our line of travel. Most of the main streams, however, were travelled, and different trips made across the plateau regions wherever practicable, and the data thus obtained, together with information gathered from the Indians, gave a fairly good idea of the entire region included between the boundaries above mentioned.

The Black River Country.

North of latitude 59° 15′ to the north boundary of the Province is an extensive area drained by the Black River, which flows westerly into the Liard River. This country, according to information gathered from the Indians, is apparently similar in its physical aspects to that adjoining it on the south. As far as I could learn, there are no Indians now hunting in this region, excepting a few of the Fort Liard Indians, who travel some distance up the Black River from its mouth. My informant was one of a band of eight who made a winter trip for supplies from their camp on the Kotcho Lake north to the Black River, and thence down this stream to Fort Liard. He described it as a region of scrub spruce and tamarack moss country, with a strip of swamp-hay land along the Black River. A large proportion of the country has been visited by fires which, he said, spread north during the season the Klondikers passed through the country.

Geographical Changes.

The geographical surveys have required corrections and additions to the map of this district. On the old map there appeared three small lakes at the head of the Hay River in what was found to be the district drained by the Peace River, also the Hay River enters Alberta over sixty miles north of where it is shown on the old map. A large lake is shown approximately seventy-five miles east of Fort Nelson; this was found to be of a different contour and about fifteen miles north of its old location. Also the Sikanni River is known as the Muskwa, and instead of flowing due east to the junction with the Fort Nelson River, flows for a considerable distance along the foot-hills of the Rockies, and turning north-east is joined near its mouth by the Prophet River, another large stream flowing north.

System of Survey.

For purposes of mapping, surveys were made mostly by route traverses, checked and adjusted by observations for latitude and L.M.T., from which chronometric differences of longitude were obtained. Astronomical observations were taken during the first season when travelling with pack-horses with a 5-inch micrometer transit reading to ten seconds, and latterly when travelling by back-packing a sextant was used. Advantage was taken of the hills to the west to connect a considerable portion of the survey by the system of latitude and azimuth, but the generally uniform nature of the country east from these hills, the absence of prominent hills and points of elevation, the ridges being unusually low and wooded, did not admit of a regular system of triangulation. Observations were also taken at different points to determine the magnetic variations. From a small aneroid barometer readings were taken each day, and, although found to be erratic, were used in working out the elevation. A thermometer was also carried; the temperature-readings are tabulated and attached to this report, and a kodak enabled me to obtain a set of photographs which give an idea of the general features of the country.

Fort Nelson Trail.

During our first summer in the country we travelled with horses, following, generally, the Beaver Indian trails. In making one's way across this country without a guide, great difficulty is experienced in keeping to the right trail, owing to the confusing number of branch trails, which run in every direction, as a result of the Indians being continually on the move, opening up new trails and hunting new ground and following the moose about.

The distance from St. John to the Sikanni River in a straight line is about 125 miles, and by the Fort Nelson Trail nearly 180. In a dry season little difficulty is experienced in getting over it with the horses. Although the trail follows ridges where possible, there are numerous swamps and bogs that must be crossed, and which, after the passage of a few animals, becomes almost impassable for further travel. As the trail also follows the beds of several streams, during high water travel would be difficult. From the summit north the whole country has

been burnt in recent years, and some of it several times, and as the amount of fallen timber will increase with every strong wind, there will always be a considerable amount of chopping when travelling by this route.

In moving our supplies up to the Sikanni, several trips were necessary between the north boundary of the Block and the Sikanni; advantage was taken of this in obtaining watch ratings, which assisted in carrying fairly accurate difference of longitude along the main line of survey. On October 16th our horses were sent back from the Sikanni River to St. John for wintering, and from then till December 19th the time was spent at the point where the Nelson Trail strikes the Sikanni. E. B. Hart, who had come from Fort Nelson, joined us on October 12th. Securing dog-teams from the post, we left our camp on the Sikanni on December 19th, and travelling the distance, eighty miles, overland by Fish Lake to Fort Nelson, arriving at the latter point on the 23rd.

FORT NELSON.

Fort Nelson is situated on the right bank of the river about three-quarters of a mile below the Muskwa, a stream as large as the Nelson and flowing from the west. This post has been established about fifty years. It was moved to its present location fifteen years ago from a point about a mile down-stream on the opposite bank. It was situated there on a low timbered flat, and being subject to floods at extreme high waters, it was moved to its new location. The post consists of the Hudson's Bay buildings, the Roman Catholic Mission, and a few scattered Indian houses. A clearing has been made around the post, and besides the company's garden the Indians have cultivated scattered patches of potatoes.

TRAVEL DURING WINTER MONTHS.

When we left the Sikanni there was only about 6 inches of snow, which increased in depth as we came north; at Fort Nelson it was nearly 3 feet. We were not able to accomplish much travelling in January and February. We were able to send out mail by the officer in charge of the post, who left on January 5th with dog-teams, going as far as Fort Simpson, a distance of over 300 miles, returning again on February 17th. On his return he was accompanied by the Roman Catholic Father from Liard, who spends the winter at the post, returning again in the spring with the Hudson's Bay transports. Extended trips were impossible owing to the difficulty in arranging for dog-teams from the Indians and shortage of feed. On January 18th I made a trip about fifty miles down the Fort Nelson River, returning to the post again on the 22nd. In March several short excursions were accomplished from the post, one to an Indian camp thirty miles north-east to Komie River, and another of ninety miles south-east across plateau to the junction of the Kaamtah and Fontas Rivers. At this point a few supplies were cached for use the following season. On April 10th we left the post for the Upper Sikanni. We travelled by dog-teams as far as Klewe Lake, making route surveys as we went. A few days were spent in this vicinity making topographical sketches of the country from the surrounding hills.

By this time there was not enough snow left for toboggans, and we proceeded on to the Sikanni by back-packing, completing the tie by triangulations to points established at the Sikanni the preceding autumn. Here we made a dug-out canoe and on May 9th continued up the Sikanni, making a rough trip up the valley and its tributaries. The Sikanni, about forty miles up, becomes very swift, and we encountered a series of rapids and falls, making up-stream work very difficult and slow. The canoe was therefore abandoned and we continued farther south by back-packing overland, coming again to the river at the mouth of Coal Creek at the point where the Sikanni turns sharply to the west (latitude 57° 29′). Here we found a cabin that had been used the previous winter by white trappers from Fort St. John. The valley of the Sikanni at this point, and as far as one could see up-stream, resembles a deep canyon. The valley is not more than a quarter to half a mile wide, the sides rising up precipitously 1,200 to 1,400 feet and terminating in sandstone cliffs. After returning down-stream again to our old camp at the horse-trail a trip was made easterly through the woods to the Kahntah River.

SIKANNI RIVER.

On July 3rd we continued down the Sikanni River to Fontas River. While the Sikanni farther up the stream was swift and rapids were numerous, the fall in the river becomes less

as one goes down, there being long stretches of nearly slack water between the riffles. Where the river cuts into the sides of the valley, banks are formed chiefly of crumbling dark clay shale. At many of the bends of the river, where the silt-banks had been cut away, huge trees had fallen into the river, and being anchored by the weight of their roots, remained stuck in midstream. In many places there is only a narrow channel left between these obstacles to pass the canoe through. We reached the Fontas River on July 6th, and as we were preparing to leave up-stream the following morning, ten canoes loaded with Indians came down. They were on their way to the post, and all in a starving condition, having been unable to get any moose for some time. They begged us for tea and tobacco, for which they insisted on exchanging moccasins and gloves. They gave us useful information about the country, trails, etc., up Fontas River and towards the Hay River, but when asked whether one of their number would accompany us as guide, they said that, being in a poor game country, they could not afford to let one of their hunters go. We were able to take our canoe ten miles up the Fontas, when, the water becoming too shallow, we abandoned it and continued back-packing.

Fontas River.

The Fontas River at its mouth is 150 feet wide. The water is a dark brown and forms a deep contrast to the white silty waters of the Sikanni. The current is sluggish, not more than half a mile an hour for the first fifteen miles, after which it gradually becomes swifter. The water was low owing to the dry season, but in ordinary seasons, however, according to the Indians, there is enough water to canoe up as far as Kahntah River. On July 11th we reached the cache at the mouth of the Kahntah River, and from this point trips were made farther up Fontas River, also up Ekwantea and Kahntah, and easterly towards Hay River.

Fort Nelson River.

Returning again to the mouth of the Fontas River, we started down the Fort Nelson River on July 28th. The river improves farther down-stream, and I am convinced that light-draught boats could navigate the Fort Nelson River as far up as the Fontas River without any difficulty. We arrived at the post on the 29th and found all the Indians here awaiting the arrival of the Hudson's Bay scow and Treaty party from Fort Simpson. They were due on the 27th, and meanwhile the Indians were out of tea and tobacco, and were reduced to using flint and steel for matches. The Hudson's Bay transport did not arrive until August 8th, and in the meantime I had made a trip down-stream and explored the country in the vicinity of Snake River. In planning the remainder of the season it was decided that Mr. Cartwright should return to St. John, and with horses to make his way to the headwaters of the Hay River, while I, in the meantime, would travel the plateau east of the Fort Nelson and work my way out in the autumn by the Hay River with a view to meeting Mr. Cartwright with the horses. Mr. Cartwright left Fort Nelson on the 14th, and travelled south with the Sikanni Indians as far as the horse-trail, making his way alone to Fort St. John.

Joining forces with a band of Indians travelling through the plateau regions to the east, I was able to see a good deal of the country during the time I was with them. After gaining their confidence and goodwill they furnished me with guides, and did whatever they could to further my plans. When I finally signified my intention of starting south for the Peace River, they tried to dissuade me from making the trip, saying that the country I would have to travel was impassable and was either bog or blocked with fallen timber. They eventually, however, decided to furnish a guide as far as the cache at the mouth of the Kahntah, but no farther, as none of them knew the country farther south. They took me around by the Hay River, following in places old trails now overgrown and almost obliterated by fallen timber. We found evidence in places of the Hay Lake Indians having travelled certain trails recently with horses. These Indians sometimes travelled as far west as the Hay River. We arrived at the cache on December 30th. The next day the Indians returned to their camp and I started south, and although my course lay through the woods, until I reached the Beaver Indian trails I met with little difficulty, and with the two pack-dogs I had loaded was able to make fairly good time. I finally ran into some Beaver Indians on October 16th at the North Pine River, twenty miles from Fort St. John, after having travelled a distance of 190 miles from the cache at the mouth of the Kahntah River. The Indians told me that white men were fighting, and, receiving news-

papers, I learned that the greatest war in history had been waging in Europe for two and a half months. The next day I joined up with Mr. Cartwright, who had been travelling the head-waters of the Hay River.

In the trip south I crossed on the south side of the summit a good-sized stream 150 feet wide running east, the name of which I was unable to ascertain from the Indians at St. John. They called it the headwaters of the Hay River, saying that after flowing east it turned north again, but as far as I know it may be the Battle River. Although I experienced fair weather throughout the trip, I was informed by the Beaver Indians that they had had 6 inches of snow where they were hunting. We left St. John on October 24th by small boat down the Peace River to Peace River Crossing, which, during our absence of eighteen months, had developed into a thriving settlement of more than 1,000 inhabitants. We also found the British Columbia & Dunvegan Railway had progressed as far as Sawridge, travelling by train from there to Edmonton, and after completing what business I had there, continued on to Victoria.

The following is a table of distances travelled from time of leaving Edmonton till our return:—

Railroad	305	miles.
Steamboat	525	„
Wagon-road	181	„
Canoe	445	„
Pack-horses	972	„
Back-packing	1,473	„
Dogs and toboggans	510	„
Total	4,481	miles.

INDIANS.

North of the St. John Settlement there are no white settlers. There are no Indian villages such as are found west of the mountains. These Indians are nomads and travel and hunt in bands, with a chief selected from among themselves.

The Beaver Indians who trade at Fort St. John and Hudson Hope use horses and hunt as far north as the headwaters of the Fort Nelson River, and occasionally along the Upper Hay River. The Fort Nelson Indians are the Sikannis and Slaves. The former keep mostly to the west of the Fort Nelson River, while the Slaves hunt the country north and east and south-east of Fort Nelson. As the Fort Nelson region is away from the main line of travel, the only white men seen are those connected with the Hudson's Bay Company, the Indian Agent (once a year), and the Roman Catholic missionary. The Indians have seen little of white people or civilized life, and consequently retain more of their original habits and customs than usually found among Indians nearer the border of civilization.

There is difficulty in obtaining these Indians as guides or even in employing them in any capacity, and when one is engaged it is generally understood that, in addition to his wages, provision has to be made for his family. Once their confidence is gained, however, and a bargain struck, they are invariably found willing and honest. Imbued with the usual Indian traits, they are naturally inclined to improvidence and make little provision for times of scarcity. They live principally on moose-meat and smaller game. The Slave Indians make different articles, useful and ornamental, from porcupine-quills, which find a ready market with the tourists and others who travel the Mackenzie. When an Indian party starts out from the post to their hunting-ground, each member of the party, the children and dogs included, has to pack on his or her back part of the outfit. Their packs consist, besides their camp outfit, of principally tea and tobacco and cartridges. The hunters generally go ahead of the rest with an axe, rifle, and light pack, and as soon as they arrive at the camping-ground, leave their packs and go off on a hunt. It sometimes happens, when in a poor part of the country for moose, that they subsist for days entirely on a few rabbits and grouse, and sometimes squirrel. In the spring and summer, when they wish to travel down-stream to the post, they usually go by canoe. Being unable to secure birch-bark in large enough pieces, their canoes are made of spruce-bark or "pine," as it is called in the country. They are very small and frail and seldom carry more than one man and his hunting outfit. They are used only for one trip, and that down-stream, and being so fragile are seldom taken up-stream. They are convenient, however,

as two Indians can make one in half a day. After selecting a suitable tree it is cut down and the bark peeled off in one piece the required length of the canoe. This is fitted and sewn on to a frame of spruce; the ends are sewn together, and the whole thing is ribbed with young willows and spruce. The knot-holes are then gummed and the canoe is ready for the water.

General Topographical Features.

In a general description of the region under review, one of the outstanding features is the uniformity of the surface. Especially is this noticeable to one coming from other parts of British Columbia west of the Rocky Mountains. There is an absence of prominent hills and mountains, and although it is more or less undulating, the whole region may be spoken of as a huge plateau. Travelling north from the bench north of Peace River at an elevation of approximately 2,100 feet, the country rises gradually to a height of land between the waters of the Peace and Fort Nelson Rivers. This watershed at the summit attains an altitude of approximately 3,500 to 3,700 feet, and lies east and west across country at roughly latitude 57° 30′. An excellent view of the territory to the north was obtained from this summit. Looking north and east, the country gradually subsides from its rough and broken character at the summit to that of low rounded ridges, and which as one proceeds north merge with the general level of the vast plateau which extends northerly throughout the country travelled. Until one reaches the latitude of Kotcho Lake the country rises in no place into what may be called a hill, although it has a general slope to the north and may be described as gently undulating. North from Kyklo River the country rises again gradually to Kotcho Lake, to the west of which are low isolated hills, and which, extending north-westerly, form the height of land between the waters of Fort Nelson and Black Rivers. The westerly boundary of this plateau region is formed by a line of broken flat-topped hills extending north-westerly between the Prophet and Fort Nelson Rivers. These hills are sharply defined and rise abruptly 1,000 feet above the plateau, and would appear to have formed at one time part of a high table-land which extended easterly from the foot-hills of the Rockies. Around the rims of these hills are cliffs formed of a coarse-grained sandstone which is of a conglomeration of coarse gravel and sand.

Moss and Muskeg.

Another feature is that, with the exception of along the river-valleys, the ground throughout this region is covered with a growth of moss varying in depth from a few inches to 6 feet. Our first summer in the country was unusually wet, and our first impression of these plateau lands was not favourable. Heavy rains fell in June, July, and August, and the plateau of the country, with the slow drainage, together with the clay subsoil, the whole country had the appearance of being marshy and swampy. Upon further examination the following summer, which was dry and warm, these mossy areas seemed not so formidable. In warm, dry weather the top of the moss is easily burnt, and large areas being swept by fire, a great change takes place; poplars and willows and grass grow where before was scrub spruce and tamarack. The moss acts as a sort of sponge and retains the moisture and keeps the heat of the sun out; in fact, there is ice on some of the muskegs all the year round. On the hot days in the middle of the summer, when travelling, there was little difficulty in finding clear cold water for drinking purposes. There have been large tracts where the moss has been burnt out, and considerable burnt areas were encountered that had previously been muskeg, as shown by patches of moss that were left where the muskeg had been. In this sort of burnt area grass was often found 2 to 4 feet high. When drained and the moss removed it is reasonable to suppose that the greater proportion of this land will be cultivable.

There is evidence in many instances that when the country is cleared and the moss burnt off the penetrative powers of summer thaw is at once greatly increased, and lands become productive which at first appear hopelessly barren.

I quote the following remarks, in reference to muskeg lands, by J. L. Cote, D.L.S., who has had a wide experience and travelled considerably in the northern parts of Alberta:—

"In the Canadian Pacific Railway report McConnell described the vicinity of Athabaska Landing as follows: 'On either side of the trail in the vicinity of Athabaska Landing was almost a dense growth of small poplar or muskeg, the soil consisting of sand or clay, with slight clothing of black mould. A half-breed informed me that this description of soil extended to Lac la Biche.'

"This was in 1879, but an inspection of the latest Homestead Map will show you that practically all the land in the vicinity of Athabaska Landing is now settled.

"Some years ago I made the survey of the country around Athabaska Landing, and from what I have seen and from information from old settlers, I can vouch that McConnell's report was correct, but with the advent of settlers and forest fires an evolution has taken place.

"A certain portion of the ground is, or was, covered with a growth of spruce and small tamarack which appeared to be rooted in a deep layer of moss or black peat 12 to 36 inches deep, and which is commonly called muskeg. These muskegs are generally found in a low-level country where there is no natural drainage, or where the drainage has been obstructed by some cause or other. A common cause is that the banks of the rivers are often higher than the rest of the plateau, or the beavers have dammed the outlet, or frost. The rivers in the three Western Provinces are generally flowing in a deep trough below the average elevation of the plateau, except for an occasional break. This trough seems to have been made by an immense drag leaving part of the material from the valley on each side, therefore leaving the immediate surrounding of the valley higher than the rest of the plateau. The site of Edmonton is a concrete example where the immediate edge of the valley is 25 feet higher than the surrounding country. Around Athabaska a few short ditches of a few hundred feet have drained some thousand acres.

"The beaver-dams are responsible for a fair proportion of these muskegs, but they can be easily dealt with. The perpetual frost is probably responsible for the greater part of these muskegs. The accumulation of the moss for ages, and with the shade of the evergreen leaves of the spruce, have prevented the rays of the sun from penetrating the deep frost accumulated during the long winter. Every surveyor has at some time found frost at 18 inches till late in the summer, and in a few places in the late fall. The frost holds the water back and prevents drainage, thus accelerating the growth of the moss. Survey posts have been found 6 inches under the moss after twenty-five years. The only way to remove this natural refrigerator, which, by the way, affects the local climate, is for a fire to burn the evergreen leaves and give the sun a chance to thaw and dry the timber sufficiently for a second fire. After it has gone through this process, I have on many occasions seen poplar and willow replacing the muskeg spruce and becoming arable land. The subsoil is generally clay or sandy clay, and I have seen boulders under the moss and even sticking out of it, showing that it has a hard bottom.

"The buildings of the Edmonton, Dunvegan & British Columbia Railway for a number of miles through these muskegs have been satisfactory and they have always found a hard bottom.

"Hence, from the experience of the past, I am confident that a large percentage of what we now consider useless muskeg will become, with the advent of settlement, good arable land."

DRAINAGE-BASIN.

Taking the total area of the country under review at roughly 18,000 square miles, about one-quarter lies south of the summit and is drained by the North Pine River, and to a small extent by an unidentified stream flowing easterly into Alberta, and which, according to the Indians, was the headwaters of the Hay River. The main stream draining the northerly slope is the Fort Nelson River, flowing north-west into the Liard. The Hay River, flowing north-east into Great Slave Lake, also drains a portion of this area to the east.

THE NORTH PINE COUNTRY.

The North Pine River flows easterly from the Rockies, and leaving the broken country extending from the foot-hills, turns southerly and enters the Peace River Block, and finally empties into the Peace River forty miles below Fort St. John. The valley of the North Pine deepens and becomes more defined as it flows through the plateau, the banks being one-half to a mile apart and 500 feet high where it enters the Dominion Block.

The same applies to the streams flowing into it; originating mostly on the surface in the swamps, the valleys become narrow and deepen as they approach the North Pine. The average current in the North Pine is about one mile and a half per hour, and where it is joined by the Blueberry the width of the river-bed is about 300 feet. The river-bottom is roughly about three-quarters of a mile wide and contains some good land, there being numerous open hay meadows, alternating in patches of spruce, pine, and poplar timber. The soil is good, being alluvial loam.

The largest stream flowing into the North Pine is the Blueberry, flowing from the foot-hills and joining the North Pine a few miles north of the Dominion Block. Along the valley of this stream are some excellent stretches of agricultural land, several townships of which have been surveyed by the Provincial Government and which are available for pre-emption. Good land is also found along the several streams shown flowing southerly parallel to the North Pine and emptying into the Blueberry. Immediately along these streams the soil is good, being a black loam with clay subsoil, supporting an excellent growth of grass and peavine. While rising on the ridges separating the valleys, the soil is clayish, and in places light sandy clay, all with a clay subsoil; the growth being second growth of poplar and willows, also occasionally spruce, pine, and poplar timber. Wherever there is sufficient drainage along the banks of streams there is usually a good growth of grass, with patches of willow and poplar, while on the bench land there are numerous mossy swamps.

Agricultural Land East of the North Pine.

East of the North Pine there is considerable extent of plateau containing land suitable for agricultural purposes. An approximate estimate would give, roughly, 250,000 acres of land that could be brought under cultivation with very little labour. The original timbered growth has been burnt off and replaced by a second growth of poplars and willows. While there are the usual mossy areas, good soil, which is generally clay loam with clay subsoil, is found throughout. This clay subsoil is generally compact and impermeable to water.

Proceeding north of this area, as the country rises north gradually to the summit the land becomes less attractive as farming land, there being numerous marshes and bogs permanently unsuitable for agricultural purposes.

Summit Hills.

The summit hills have practically all been burnt over, and are now difficult to travel owing to the fallen timber and dense second growth of jack-pine and alder. There is a good growth of grass found throughout, and excellent summer grazing is afforded in patches that have been cleared of windfall and bushes. A large proportion of this country would be available for summer range when the areas, at present obstructed by windfalls, etc., are cleared off. Dotted along the summit are small clear lakes about the margin of which there is a thick growth of swamp-hay.

Sikanni River.

North of the summit we are on the headwaters of the Fort Nelson. This river is formed by the junction of the Sikanni, originally called the "Sikanni Chief," and the Fontas River, formerly the "East Branch." The former finds its source in the foot-hills of the Rockies and flows easterly and north, and leaving the hills turns north again through the plateau, and finally north-west to its junction with the Fontas River. Until it leaves the high table-land, the valley of the Sikanni is deep and narrow, and the agricultural land is confined to narrow flats along the river. Passing out to the plateau region, the valley widens to three-quarters to one and a half miles, the benches being 350 to 400 feet high; and, while the river-flats are timbered, there are occasional grassy openings with groves of second-growth willow and poplars. The soil along the river-bottoms is excellent alluvial loam. The entire country in the vicinity of the Sikanni River, with the exception of patches of swamp here and there and timbered flats along the river, has been fire-swept, and the result is a second growth of jack-pine, poplars, and willows; also, in many places, a tangled mass of down timber. In places along the Upper Sikanni patches along the side-hills have been burnt clear of fallen timber, and a good growth of grass can be found affording good summer range.

Conroy and Katah Creeks.

In the vicinity of Conroy and Katah Creeks, which drain from the summit and flow into the Sikanni, the same condition exists of fire-swept country, either with a second growth of willows and poplars amongst standing clear timber and windfall, or burnt mossy swamps with dead spruce and tamarack. The valley of these creeks is narrow, being about half a mile wide, and contain very little bottom land.

North of the Sikanni where it leaves the hills there is an area of, roughly, 80,000 acres that, although largely moss-covered, could be included with the lands suitable for agriculture. It has all been burnt over and is covered with second growth of willows and poplar, with occasional spruce and tamarack swamps. Although the soil is generally clayish, with clay subsoil, upon removing the moss in many places is found 6 inches to a foot of good black loam.

FONTAS RIVER BASIN.

The Fontas River drains an area of, roughly, 3,000 square miles. Draining a plateau region, its waters are derived mostly from surface waters and swamps and lakes, and probably to this it owes its dark-brown colour. This stream originates near the hills in the vicinity of the Provincial Boundary, and flows north-west on the south and Ekwan Creek on the north. It then follows a more or less direct course about S. 80° W., and joining with the Sikanni forms the Fort Nelson River.

Until it receives the Kahntah River the Fontas River is little more than a creek, and during a dry season it contains very little water. Below the Kahntah River the Fontas is about 150 feet wide and sluggish, the current being not more than one-half to a mile an hour.

Along the river-bottoms we passed through some excellent groves of spruce timber on the points, while back closer to the benches we came across numerous small hay meadows from 1 to 10 acres in extent. The soil along the river is good alluvial loam and the growth of grass excellent.

KAHNTAH AND ET-THE-THUM RIVERS.

The Kahntah and Et-the-thum Rivers commence from numerous small streams draining the region of the summit; they both pursue a northerly course and empty into the Fontas River. Like the other streams of the region, good land is found immediately along the valleys, while the outlying country is usually wet and swampy. Farther up the Kahntah is a strip of good agricultural land containing probably 80,000 acres. It is second-growth poplar and willow country, with "deadstick" and "windfall." Upon the removal of a slight covering of moss, the soil was found to be dark clayish loam with clay subsoil.

It was noted with regard to many of the streams in this flat country that the land immediately along the top of the benches is a few feet higher than the surrounding country, and, although the drainage near the river is general, back from the edge of the valley on the plateau there is usually a wide expanse of swamp covered by a stunted growth of spruce and tamarack and carpeted by heavy layers of moss. This description applies to large areas on the plateau to the north and south of Fontas River.

Ekwan Creek is the only stream of any size coming into the Fontas on the north side. It drains a lake of the same name about five miles long and one mile wide. Around the edge of the lake is a growth of slough-grass, while the surrounding country is low and marshy. This lake, the Indians say, is a favourite place for moose. Between Ekwan River and Fontas there is a patch of about 20,000 acres of good agricultural land. Along the small streams draining through the tract are grassy openings where quantities of hay could be cut.

FORT NELSON RIVER.

The Fort Nelson River below the forks pursues a generally north-westerly direction to the Liard. The Muskwa River, nearly of equal size to the Upper Fort Nelson, flows from the west and joins the latter about three-quarters of a mile above the Fort Nelson. After receiving the Muskwa the width of the Fort Nelson is increased to approximately 900 feet, with a full strong current averaging three to four miles an hour.

The valley of the Fort Nelson is about three-quarters to a mile and a half wide, and the benches on either side are about 350 feet high. The river flows in a winding course through the lower flats, forming peninsulas which are usually covered with an excellent growth of spruce and cottonwood timber averaging 1 to 3 feet in diameter. In places along these flats openings occur which are generally the result of fires, and here is found a most luxuriant growth of grass, weeds, and berry-bushes, in places 4 to 6 feet high. Around Fort Nelson each summer there is a prolific growth of wild raspberries, the Indians gathering them in large quantities.

West of Fort Nelson River.

There is a large area of plateau country west of the Fort Nelson River to the line of hills dividing the waters of this river and the Prophet River. The principal streams draining this area are Klewe Creek, draining the lake of that name and flowing north into the Fort Nelson, and Jackfish Creek, running north-west into the Prophet River.

Spurs from the main hills project across the plateau in places, and the country is thus more or less rolling, and drainage is more general than in sections of the plateau east of the Fort Nelson. Practically the whole area has been subject to repeated fires, and the prevailing growth is small jack-pine, young spruce, and poplar amongst standing dead timber and windfall. The general soil is a heavy clay impervious to water. While in places where there is spruce and pine there is only a shallow covering of decaying leaves and other vegetation, wherever there is growth of poplar and willow there is generally good soil; for from 6 inches to over a foot down the clay is dark in colour from the admixture of vegetable matter and is quite loose and friable. On the ridges, however, the heavy clay is generally found on the surface. Looking easterly from the hills around Fish Lake towards the plateau region between the Fort Nelson River and Hay River, with the exception of isolated hills near Kotcho Lake, no landmark occurs to break the severely level sky-line.

Vicinity of Snake River.

Cruising the country north of Fort Nelson on either side of the Fort Nelson River and in the vicinity of Snake and Sahtannie Creek, good land was found, a conservative estimate of which would be 80,000 acres of cultivable lands. This good land is not all continuous in one block, but all the good land taken together would total about that amount. It has all been burnt, and being more or less rolling is fairly well drained. The growth is principally small poplars, willows, and alders, with occasional patches of spruce and pine. There is excellent growth of grass and weeds, the soil being good clay loam with clay subsoil.

East of Fort Nelson.

Travelling east from Fort Nelson, after gaining the plateau we crossed over a poplar and willow ridge about 500 feet above the river. The west plateau is not encountered till after passing Snake River. Where the trail crosses Snake River there are excellent stretches of hay meadow (originally muskeg) about a mile long by half a mile wide, where, according to the Indians, several of the Klondikers wintered some horses. Continuing east, a narrow strip of poplar and willow land is found along Cheatse and Outaan Creeks. The plateau between these creeks is moss-covered, and as there had been heavy rains at the time I was there the ground was very wet, and for miles I waded ankle-deep and sometimes knee-deep in ice-cold water. At Outaan Creek a trail branches north-west to Kotcho Lake. The country along this trail is not attractive from an agricultural point of view; while there are narrow strips of dry country along the creeks where poplar and willow are growing, the outlying country is wet and marshy, with a growth of scrub spruce and tamarack. In patches of this swampy region visited by fires the dead spruce and tamarack standing at all angles gives an appearance of desolation, and is in its present state a monotonous and uninteresting country to travel through. Continuing easterly up Outaan Creek, there are small meadows as far up as the headwaters, after leaving which one passes over an almost imperceptible summit to the waters of the Hay River.

The Hay River.

Of the region under review the Hay River drains about 3,400 square miles. This stream enters the district from Alberta at about latitude 58° 10′, and flowing north-west and north, turns to the east and enters Alberta again about thirty-five miles farther north. The Hay River, unlike the Fort Nelson, has no well-defined valley, and may be said to wind its way almost along the surface of the plateau. The river itself is about 100 feet wide, and owing to the dryness of the season when I visited it, there was not enough water to float a light canoe over the bars. The Indians informed me that they use canoes on the river at ordinary stages, and very often in rainy seasons the river overflows its banks; evidence of this was found on the river-flats, the trees being marked in places to a height of 4 to 5 feet. The Hay River is sluggish and flows in a most winding course.

The Hay Lake Indians travel the Hay River and other parts of the district with horses, finding good feed in the numerous and extensive hay meadows that are scattered along the river. There are areas of good spruce timber along the Hay River, large patches of which have been destroyed by fire.

KOTCHO RIVER.

The largest branch of the Hay River is the Kotcho River, flowing southerly from the Kotcho Lake to its junction with Kyklo Creek, then turning easterly, and finally emptying into the Hay River near the east boundary of the Province. This stream is about 100 feet wide and is not navigable for canoes, the channel being obstructed in many places by log-jams and fallen timber. Along the banks, also along Kyklo Creek, are hay meadows varying from a small opening in the timber to prairies of 400 to 600 acres in extent. These meadows are not usually swampy, having sufficient drainage, and large quantities of hay could be cut, as the grass grows thickly and in places is 4 to 7 feet high.

South of Kyklo River and in the vicinity of Townsotoi Creek, a small stream flowing northwest into Kyklo, the country is low, and being poorly drained is marshy, and although there is found the usual proportion of scrub spruce and tamarack with the deep layers of moss, a considerable extent of this marshy ground is not moss-covered, but rather grassy, and with drainage would become good arable land.

North of the Kyklo River the country rises gradually to Kotcho Lake, and large areas of the country have been recently burnt over, and travelling is now difficult owing to the tangle of down timber and the dense second growth of willows and alders. The soil is good clayish loam, and a luxuriant growth of grass is found in the openings along the rivers and creeks.

When travelling these parts I followed in parts the old Klondikers' Trail, now fallen into disuse; evidence of whom was found in pieces of old pack-saddles, also the old corduroy in the swamps. After coming from the Hay River and crossing the Kotcho, this trail follows up a small creek called Sah-cho Creek. Along this creek is excellent grass land, with patches of poplar and willow. These areas of good land could be greatly increased with proper drainage. Along the creek-banks this is evident, for while the strip bordering the stream produces a luxuriant growth of grasses, bushes, and trees, a short distance away this is replaced by swamp covered by moss and scrub spruce and tamarack. As we approach Kotcho Lake country the country becomes more level and consequently more swampy, and with the exception of along the westerly side the lake is surrounded by scrub spruce and tamarack and muskeg. The hills to the west rise not more than 300 feet above the surrounding country. They have been fire-swept and are now covered with windfall.

I was unable to get as far west as Shee-keclie River, where, according to the Indians, there is some area of poplar and willow country. They said this stream rises amongst some burnt hills and fairly swift, and that flowing south it empties into Kotcho River.

TIMBER.

While practically the entire region is wooded, the only timber of merchantable value is found along the bottom of the valleys. Throughout the North Pine country patches of spruce, pine, and poplar are found, but seldom averaging more than 6 inches in diameter. Along the banks of the North Pine are some good groves of spruce, which may not more than prove sufficient to meet the requirements of the district in the future.

On the north slope, however, for the entire length of the Fort Nelson River, and for a considerable distance up the Fontas and Sikanni Rivers, is some of the finest spruce and cottonwood timber I have seen in the north. Although this timber extends seldom more than half a mile on either side from the rivers, it grows thickly and the trees are clean-trunked and tall. A patch was selected at the junction of the Fontas and Sikanni Rivers, and the average size of the trees was found to be 2 feet in diameter and 80 feet tall. Roughly taking the Fort Nelson River to its junction with the Liard, the Sikanni, and Fontas Rivers, and patches along the Hay and Kotcho Rivers, an approximate estimate would give the total area of timber lands at about 40,000 acres. The timber on the plateau is mostly scrub, principally timbered with good-sized spruce, pine, balsam, and poplar; these are of no practical use.

Minerals.

Travelling across country over the plateau region, there was a marked absence of rock-exposures on the surface. What rock was seen was generally found along the rivers in places where the streams had cut into the sides of the valley. The North Pine River a few miles north of the Dominion Block runs for several miles through a canyon, the walls of which are 400 feet high and composed of sandstone, huge blocks of which have broken off and fallen crumbling into the river. Sandstone was also noted at different points where this stream was crossed. Drift-coal (lignite) was found along the North Pine, and also many of the smaller streams flowing into it from the west, and also along Conroy and Coal Creeks, flowing northerly into the Sikanni. On Coal Creek I saw a narrow seam of lignite in the sandstone about 120 feet from the surface. Trappers who spent a winter on the Upper Sikanni reported having seen coal-seams in that vicinity. From these encouraging indications it is reasonable to suppose that systematic prospecting would result in demonstrating the existence of coal lands of economical and permanent value.

Wherever the rock was exposed on the river-banks of the Fort Nelson, Fontas, and Sikanni Rivers, it was usually a dark clay shale occasionally showing signs of clay ironstone. Along the Upper Sikanni, where the valley becomes narrow and steep in places, the banks rise 1,200 to 1,400 feet above the river; the cut-banks are usually formed of several hundred feet of this shale; above this is sandstone which as it continues to the top of the cliffs is generally precipitous and impassable at most places. Samples of gypsum were picked up on the plateau north of St. John.

Game, Fur-bearing Animals, and Fish.

Although neither so varied nor plentiful as in the mountains, there is nevertheless considerable game in this region, and moose, the main food of the Indians, is fairly well distributed throughout. Although not so numerous in the parts that have been continually hunted by the Indians, in the plateaux farther south at the head-waters of the Fontas River, which have not been recently travelled by the Indians, they range in great numbers, as evidenced by countless tracks in places tramped down like a cattle-yard.

The wood-buffalo at one time ranged in these parts, and, recent travellers assert, are still met with in the vicinity of the headwaters of the Hay River; the Indians throughout the district, however, informed me that no signs of buffalo had been found in their country for many years.

The woodland caribou or deer, as it is called in the country, are found as far north as Fontas River. In the Black River country the Indians say that caribou are more numerous than moose, finding good feed on the mosses and lichens of the region.

Of the smaller game, there are rabbits, ruffle grouse, and spruce-partridges in all parts of the country; ptarmigan were also seen. Large numbers of ducks and geese are found towards the easterly portion of the district, especially along the Hay River, and travelling this country in the autumn large flocks were encountered in the sloughs and rivers.

Fur-bearing Animals.

Black bear are plentiful, while grizzly are encountered along the foot-hills to the west. Wolves are numerous and, according to the Indians, are on the increase. They are a serious menace to the game in the country, especially moose. One band of Indians hunting towards Hay River last fall were forced to abandon certain localities owing to the bands of wolves that infested the district. The bounty on wolves existing in other parts of the Province, if made applicable here, would do much to mitigate this evil, and prompt action is necessary in order to protect the game and maintain the Indians' food-supply. Travelling in the vicinity of Kotcho Lake, we ran into a band of nearly forty of these animals, and later small bands of grey wolves were encountered a few miles north of the Dominion Block.

Furs.

Fort Nelson is considered an important fur post, the most common furs being fox and lynx. Other fur-bearing animals are beaver, marten, and mink; the latter are numerous throughout the district, although very few skins are brought into the post owing to a curious superstition the Indians have about killing them.

FISH.

Klewe Lake, situated close to the foot-hills, teems with whitefish of excellent quality, and appears to be the only lake in the region in which whitefish are found. The Indians net large quantities for winter use.

Although certain varieties of trout are found in Fort Nelson River, the other waters of the district contain only the coarser varieties—viz., jackfish, ling, pile, etc.—owing probably to the swampy nature of the water.

At Kotcho Lake the Indians put up quantities of suckers for dog-feed.

CLIMATE.

With regard to the climate of this country, being without such accurate information as can be obtained from a careful record of meteorological data embracing a number of years, only an approximate estimate can be formed of the seasonal climatic features. Usually useful information can be found in the journals that are kept by the officers in charge of the different Hudson's Bay posts, but I was unfortunate in this, as none of the old journals of the Fort Nelson post were found at Fort Nelson, and apparently none had been kept for a number of years; also the officer in charge was new to the district, and, in fact, was spending his first season at Fort Nelson, and therefore could give little information about previous seasons. William Ogilvie, in his report, gleaned the following entries from the journals that he found at Fort Nelson at that time:—

"1887—First drift-ice in river omitted. River frozen over October 23rd.

"1888—Ice drifted out of river May 7th. First drift-ice in fall, October 17th. River set fast October 31st.

"1889—Ice started April 10th. First drift-ice in river October 30th. Ice set fast November 10th.

"1890—Ice started down river April 30th. Planted potatoes May 17th. Took up potatoes September 18th. First drift-ice October 23rd. Ice set fast November 4th.

"1891—Ice started out of river April 22nd. Ice set fast November 4th."

Potatoes were planted in the spring of 1914, about May 10th, and upon my return to the post the first week of August I found a good crop of potatoes of good size and quality. The potatoes were finally harvested September 14th.

Actual experiments undertaken in these latitudes, and even at points farther north, leave no doubt of the sufficient length and warmth of the growing season to ripen wheat, oats, barley, with all ordinary root-crops and vegetables. As an example, the above have been grown successfully at Fort Liard in latitude 60° 10′ for a number of years, and at Fort Vermilion, which is farther east in the same latitude as Fort Nelson, an excellent garden has been maintained for years, and wheat and barley have been grown. Also on the plateau north of Fort St. John several of the settlers last season, besides growing the ordinary vegetables, ripened small patches of wheat and barley. The luxuriance of the vegetation in these parts, especially along the river-bottoms, is astonishing, and indicated the fertility of the soil and assurance of sufficient rainfall. Temperatures and other weather notes were taken during our stay in the country, and these, together with observations on the general character and appearance of the natural vegetation, will assist in arriving at what may be expected under normal weather conditions.

The summer season of 1913 was unusual and characterized by excessively heavy rainfall, with cold, raw weather in June, July, and August. This rainfall seemed to be general throughout the district, and travelling along the streams the following season, which was an unusually dry one, there was evidence in marks on the trees where the banks were flooded owing to heavy rains. No regular maximum temperatures were taken when travelling, but the thermometer was frequently read on what seemed the hottest days, and 78 degrees was the highest noted the first season. From June 14th to 30th two frosts occurred, on the 19th and 26th, when the thermometer registered 31 and 28 degrees respectively. In July slight frosts occurred on the 5th, 9th, and 30th. On August 14th and 22nd the thermometer registered 31 degrees, being the only frost during the month. The winter, although cold, was not severe, and was comparatively free from the blizzards that occur in the more open country farther east of the mountains. The snow, which generally fell in the form of light powder, attained a depth of 3 feet at Fort Nelson. This light and powdering snow is difficult to travel through, and the Indians, when breaking

trail, find it necessary to use extra large shoes. Farther south along the Fontas and Sikanni Rivers, and easterly to the Hay River, there was not more than 2 feet of snow, and in places, according to the Indians, the greatest depth of snow was only 18 inches. This is owing to Chinook winds, which, however, are seldom felt as far north as Fort Nelson. In places along exposed side-hills the ground was bare in the middle of September. We had flurries of snow on September 22nd and at intervals during October, but the first snow that stayed fell on October 26th. Through November and the first half of December the weather was comparatively mild; snow would sometimes fall to a depth of a few inches, but would be taken off again by the Chinook winds. These winds generally came from the south-west, and the thermometer would rise from 0 to 40 degrees in a few hours, when the snow would thaw rapidly. If the wind blew from the north or north-west it generally snowed, and if from the opposite quarter it seldom failed to bring mild weather. The Sikanni River froze over about November 20th, but the ice, owing to the mild weather, was not fit for travelling till the middle of December. During the winter months temperature-readings were taken by F. Hazen at his homestead on the plateau north of St. John, and from comparisons with simultaneous readings taken at Fort Nelson it was found to be about 6 degrees colder at the latter point throughout the winter. The lowest temperature-reading at Fort Nelson was 51 degrees below zero on January 25th. The coldest weather occurred during the latter part of January and the first week of February, and although the minimum thermometer-readings averaged 35 degrees below zero for two weeks, the weather was not disagreeable, the days being usually clear, with three or four hours of sunshine. During March there were several slight blizzards, otherwise the weather was mild and generally marked by bright sunshine. Towards the end of the month it became warm enough during the day to melt the snow. April was very fair. Spring came with a rush in April, and by the end of the month only a few patches of snow were left here and there in places sheltered from the sun. The Sikanni River broke up about the 22nd and was cleared of ice about the 27th. Grouse were first heard drumming on the 21st, and geese first seen on the 25th. During May clear warm weather prevailed, and with the advantage of long hours of sunshine the growth made marvellous strides. Willows and birch showed signs of budding on the 7th, and by the 18th leaves were in full bloom. May and June were dry months and the air was constantly hazy from smoke of bush fires. On clear nights the thermometer usually dropped to freezing or below, especially following westerly winds during the day. Excellent weather prevailed throughout the remainder of the summer, which, unlike the previous summer, was unusually dry. Although the days were warm, travelling was made agreeable by pleasant breezes. The plateaux at Fort Nelson, which were harvested about September 15th, had not been affected by frost, and were large and in excellent condition. By the middle of September the foliage was noted changing colour, and by October 1st the leaves were off the trees. We had the first snow on October 19th on the plateau north of St. John; this disappeared the same day.

I have, etc.,

G. B. Milligan, B.C.L.S.

WEATHER RECORD.

(OBTAINED BY G. B. MILLIGAN, B.C.L.S., ON EXPLORATION SURVEYS IN NORTH-EASTERN PORTION OF THE PROVINCE IN 1913 AND 1914.)

JUNE 14TH TO DECEMBER 31ST, 1913.

Place.	1913.		Bar.	Thermometer.			Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
	Date.	Hour.		At Time	Max.	Min.					
				Degs.	Degs.	Degs.					
Fort St. John	June 14	7 a.m.	28.46	..	..	40	W.	5	10	Rain	Rain.
	June 14	2 p.m.	28.50	..	..	..	W.	4	10	Heavy rain	Rain.
	June 14	9 p.m.	28.57	..	..	..	W.	5	10	Rain, gloomy ...	Cold rain.
	June 15	7 a.m.	28.75	..	..	40	N.W.	3	10	Drizzling rain ..	Rain.
	June 15	2 p.m.	28.71	..	..	..	W.	3	10	Drizzling rain ..	Clouds low.
	June 15	9 p.m.	28.72	..	..	..	W.	6	10	Drizzling rain ..	Rain.
	June 16	7 a.m.	28.73	..	..	45	S.E.	5	10	Drizzling rain ..	Drizzling rain.
	June 16	2 p.m.	28.74	..	..	..	...	..	5	Fair	Cold rain.
	June 16	9 p.m.	28.75	..	..	..	E.	2	..	Fair	Fair.
	June 17	7 a.m.	28.73	..	..	36	...	..	2	Very fair	Very fair.
	June 17	2 p.m.	28.70	..	..	..	E.	4	3	Very fair	Very fair.
	June 17	9 p.m.	28.75	..	..	..	S.E.	2	6	Fair	Fair.
	June 18	7 a.m.	28.66	..	..	40	E.	1	3	Fair	Fair.
St. John to Fish Creek	June 18	2 p.m.	27.82	..	..	..	S.E.	4	5	Fair	Fair.
	June 18	9 p.m.	27.90	..	74	..	E.	2	..	Fair	Fair.
Fish Creek	June 19	7 a.m.	27.96	66	..	31	...	..	..	Fair	Fair.
	June 19	2 p.m.	27.90	..	..	..	E.	2	4	Dull	Fair.
	June 19	9 p.m.	27.85	..	..	..	E.	4	10	Cloudy	Banked clouds.
	June 20	7 a.m.	27.86	65	76	46	S.W.	3	10	Gloomy	Fair.
Fish Creek to Montagneuse Creek	June 20	2 p.m.	...	..	..	..	...	..	10	Rain	Rain at 11 a.m.
	June 20	9 p.m.	27.70	..	..	..	...	..	10	Drizz., misty rain	Rain.
	June 21	7 a.m.	27.10	..	..	50	S.W.	2	10	Dull	Rains during night.
Fish Valley	June 21	2 p.m.	27.48	65	..	..	S.W.	1	10	Rain	Drizzling rain.
	June 21	9 p.m.	27.35	62	..	..	S.W.	1	10	Rain	Heavy showers.
	June 22	7 a.m.	27.26	59	..	52	S.E.	2	9	Cloudy	Rain.
N. Bdry., Dom. Block..	June 22	2 p.m.	27.32	..	..	..	N.	3	8	Detached clouds..	Gloomy.
Blueberry River	June 22	9 p.m.	27.47	..	70	..	N.	4	8	Heavy rain	Passing showers.
	June 23	7 a.m.	27.54	..	..	49	N.E.	2	10	Gloomy	Rain.
	June 23	2 p.m.	27.55	..	..	..	N.E.	2	6	Showery	Showery, clouds.
	June 23	9 p.m.	27.55	..	72	..	N.	4	10	Gloomy	Showery and fair.

	June 24	7 a.m.	27.63	..	..	53	N.	4	10	Overcast	Rain at intervals.
	June 24	2 p.m.	27.68	..	..	..	N.	6	9	Clearing	Rain.
	June 24	9 p.m.	27.80	..	65	..	N.	2	8	Part cloudy	Clearing.
	June 25	7 a.m.	27.94	..	..	46	N.	1	..	Fair	Fair.
Nelson Trail	June 25	2 p.m.	27.61	..	..	..	S.E.	2	3	Fair	Fair.
Buick Creek	June 25	9 p.m.	27.47	..	..	..	...	..	..	Fair	Fair.
	June 26	7 a.m.	27.48	..	..	28	...	..	..	Very fair	Clear, fair.
	June 26	2 p.m.	27.65	..	..	..	E.	1	..	Very fair	Very fair.
	June 26	9 p.m.	27.64	..	..	..	...	..	..	Very fair	Very fair.
Umbach Creek	June 27	7 a.m.	27.64	..	..	31	...	..	1	Very fair	Heavy dew, slight frost.
Nelson Trail	June 27	2 p.m.	27.44	..	..	..	N.	2	8	Clouding	Fair.
Flume Creek	June 27	9 p.m.	27.42	..	..	..	...	..	4	Fair	Fair.
	June 28	7 a.m.	27.42	..	..	38	...	..	..	Fair	Fair.
Umbach Creek Valley..	June 28	2 p.m.	27.16	..	..	..	...	..	4	Fair	Fair.
Nig Creek	June 28	9 p.m.	27.11	..	..	..	...	..	3	Cloudy	Thunder and showers.
	June 29	7 a.m.	27.15	..	..	45	...	..	4	Fair	Fair.
	June 29	2 p.m.	27.28	..	..	..	S.W.	2	1	Fair	Fair.
Nig Creek to North Pine	June 29	9 p.m.	27.36	..	..	..	...	..	7	Banked clouds ..	Thunder and light showers.
	June 30	7 a.m.	27.43	..	..	36	...	..	..	Fair	Fair.
North Pine	June 30	2 p.m.	27.60	..	..	..	S.E.	1	3	Clouding	Fair, light clouds.
	June 30	9 p.m.	27.56	..	..	..	...	..	10	Fair	Cloudy, wind south-east; thunder-storm at 2.15.
	July 1	7 a.m.	27.57	..	..	47	...	..	3	Fair	Rains at 3 a.m.
	July 1	2 p.m.	27.53	..	..	..	S.E.	2	9	Cloudy	Cloudy.
	July 1	9 p.m.	27.50	..	..	..	...	..	9	Drizzling rain ..	Cloudy and dull.
	July 2	7 a.m.	27.56	..	..	47	...	..	10	Rain	Rains during night.
	July 2	2 p.m.	27.55	..	..	..	...	..	10	Gloomy	Fair.
	July 2	9 p.m.	27.61	..	..	..	E.	1	9	Clearing	Rains most of afternoon.
	July 3	7 a.m.	27.64	..	..	46	...	..	5	Clearing	Fair.
	July 3	2 p.m.	27.58	..	..	..	E.	4	1	Fair	Fair.
	July 3	9 p.m.	27.55	54	..	..	...	..	4	Fair	Fair, windy.
	July 4	7 a.m.	27.57	..	..	36	E.	1	10	Overcast	Cloudy.
North Pine to Nig Creek	July 4	2 p.m.	27.38	..	..	..	S.	2	2	Fair	Clearing.
	July 4	9 p.m.	27.70	..	..	..	E.	4	4	Fair	Fair.
Nig Creek	July 5	7 a.m.	27.72	..	..	31	E.	3	..	Very fair	Fair, clear night.
	July 5	2 p.m.	27.65	..	..	..	W.	4	2	Fair	West breeze, fair.
	July 5	9 p.m.	27.66	..	..	..	S.W.	2	1	Fair	Fair.
	July 6	7 a.m.	27.67	..	..	29	...	..	..	Very fair	Fair.
Nelson Trail	July 6	2 p.m.	27.41	..	..	..	S.	2	9	Clouding	Fair.
Nelson Camp	July 6	9 p.m.	27.45	..	..	..	...	..	10	Cloudy	Light rain.
	July 7	7 a.m.	27.40	..	..	46	N.W.	3	10	Heavy rain	Rain all night.
	July 7	2 p.m.	27.50	..	..	..	N.	4	10	Rain	Heavy rains.
Umbach Creek Camp ..	July 7	9 p.m.	27.64	..	..	..	...	..	8	Rain	Rain.
	July 8	7 a.m.	27.64	..	..	40	S.E.	7	..	Fair	Rain stops at 7 p.m.
Nelson Trail	July 8	2 p.m.	27.60	..	..	..	S.W.	7	1	Fair	Fair.

WEATHER RECORD—*Continued.*

JUNE 14TH TO DECEMBER 31ST, 1913—*Continued.*

Place.	1913. Date.	1913. Hour.	Bar.	Thermometer. At Time	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
				Degs.	Degs.	Degs.					
Umbach Creek	July 8	9 p.m.	27.52	..	..	..	...	..	4	Fair	South-west breeze, fair.
	July 9	7 a.m.	27.52	..	..	30	S.E.	1	1	Fair	Clear night.
Nelson Trail	July 9	2 p.m.	27.33	..	..	..	S.W.	5	2	Fair	Fair.
Blueberry River	July 9	9 p.m.	27.66	..	..	..	S.W.	2	6	Fair	Fair.
	July 10	7 a.m.	27.76	..	..	33	S.W.	5	3	Fair	Fair.
Blueberry Valley	July 10	2 p.m.	27.74	..	..	..	S.W.	5	4	Fair	Fair.
	July 10	9 p.m.	27.78	..	..	..	W.	4	8	Detached clouds	Fair.
	July 11	7 a.m.	27.80	..	..	37	S.	1	..	Very fair	Fair.
	July 11	2 p.m.	27.77	..	..	..	S.	4	2	Fair	Fair, west winds.
	July 11	9 p.m.	27.72	..	..	..	...	..	7	Cloudy	Banked clouds.
	July 12	7 a.m.	27.76	..	..	35	S.W.	1	9	Light clouds	Light rain.
	July 12	2 p.m.	27.76	..	..	..	N.	3	10	Light rain	Light rain.
	July 12	9 p.m.	27.78	..	..	..	N.	9	10	Rain	Light rain.
	July 13	7 a.m.	27.71	..	..	46	N.	5	10	Nimbus clouds ..	Rain during night.
	July 13	2 p.m.	27.76	..	..	..	N.	8	10	Rain	Steady rain.
	July 13	9 p.m.	27.82	41	46	..	S.	1	10	Dull	Cold rain.
	July 14	7 a.m.	27.83	..	..	41	N.	1	10	Light rain	Rain all morning.
	July 14	2 p.m.	27.84	..	47	..	N.	3	10	Light rain	Rain.
	July 14	9 p.m.	27.86	..	47	..	...	..	9	Clearing	Rain stops at 5 p.m.
	July 15	7 a.m.	27.86	..	..	42	S.	1	9	Light rain	Cloudy.
Along north boundary of Block	July 15	2 p.m.	...	..	..	..	...	..	9	Clearing	Light rain.
	July 15	9 p.m.	27.67	..	..	..	...	..	9	Fair	Fair.
	July 16	7 a.m.	27.69	..	..	42	S.W.	1	9	Clearing	Fair.
	July 16	2 p.m.	27.71	..	..	..	W.	3	2	Fair	Showers at intervals.
Blueberry River	July 16	9 p.m.	27.85	..	..	..	S.	1	..	Fair	Fair.
	July 17	7 a.m.	27.89	..	..	44	S.	1	1	Fair	Fair.
	July 17	2 p.m.	27.90	..	..	..	W.	5	3	Fair	Fair.
	July 17	9 p.m.	27.95	..	..	..	S.W.	3	2	Fair	Fair.
	July 18	7 a.m.	28.00	..	..	47	S.W.	2	1	Fair	Fair.
	July 18	2 p.m.	28.04	..	..	..	W.	4	2	Fair	South-west winds, fair.
	July 18	9 p.m.	27.97	..	..	..	W.	5	6	Fair	Fair.
	July 19	7 a.m.	28.07	..	..	45	...	..	10	Cloudy	Cloudy.
	July 19	2 p.m.	28.07	..	..	..	E.	1	1	Fair, warm winds	Clearing.

Buick Creek	July 19	9 p.m.	27.95	..	..	..	S.	2	4	Banked clouds ..	Fair.
	July 20	7 a.m.	27.97	..	..	44	S.E.	2	1	....	Fair.
Nelson Trail	July 20	2 p.m.	...	..	78	..	N.E.	1	1	Detached clouds..	Fair.
Umbach Creek	July 20	9 p.m.	27.45	..	..	..	W.	1	5	Detached clouds..	Fair.
	July 21	7 a.m.	27.92	..	..	46	W.	2	8	Clouding	Fair.
	July 21	2 p.m.	27.82	..	..	..	S.W.	1	6	Detached clouds..	Fair.
	July 21	9 p.m.	27.85	..	78	..	...	..	1	Very fair	Fair.
	July 22	7 a.m.	27.86	..	..	36	...	..	..	Very fair	Heavy dew.
To Nig Creek	July 22	2 p.m.	27.68	..	..	..	S.	2	..	Very fair	Fair.
Nig Creek	July 22	9 p.m.	...	..	..	..	...	..	8		
	July 23	7 a.m.	27.63	..	..	43	S.	1	1	Very fair	Clear night.
	July 23	2 p.m.	27.57	..	78	..	S.	2	7	Fair	Thunder at 2.30, heavy rain; hail size grouse-eggs.
	July 23	9 p.m.	27.47	..	..	..	...	..	2	Clearing	
	July 24	7 a.m.	27.46	..	..	48	E.	2	9	Banked clouds ..	Showery night.
	July 24	2 p.m.	...	..	..	..	...	..	10	Gloomy	Cloudy.
Nig Creek Valley	July 24	9 p.m.	27.44	..	..	..	N.	6	10	Rain	Showery.
	July 25	7 a.m.	27.58	..	..	40	N.	3	7	Clearing	Rain during night.
	July 25	2 p.m.	27.60	..	..	..	W.	2	1	Fair	Fair.
North Pine	July 25	9 p.m.	27.42	..	..	..	...	..	..	Very fair	Fair.
Nelson Trail	July 26	7 a.m.	27.31	..	..	32	...	..	..	Very fair	Fair.
Crossing, North Pine ..	July 26	2 p.m.	...	..	..	..	E.	6	10	Cloudy	Thunder at intervals.
	July 26	9 p.m.	27.39	..	..	..	E.	2	10	Cloudy	Thunder, rains.
	July 27	7 a.m.	27.28	..	..	40	W.	2	8	Detached clouds..	Storm ceased at 5 p.m.
	July 27	2 p.m.	...	..	..	..	...	..	10	Thunder, clouding	Thunder, rain.
	July 27	9 p.m.	27.34	..	..	..	...	..	.	Clearing, fair ...	Rain at intervals.
	July 28	7 a.m.	27.31	..	..	43	...	..	10	Rain	Light rain.
North Pine Valley	July 28	2 p.m.	...	..	..	..	E.	2	10	Light rain	Rain.
	July 28	9 p.m.	27.53	..	..	..	W.	1	10	Showery	Rain.
	July 29	7 a.m.	27.48	..	..	42	E.	1	..	Fair	South-east wind at 10 a.m.
	July 29	2 p.m.	...	..	..	..	S.E.	2	6	Fair	Fair.
Lower Crossing, North Pine	July 29	9 p.m.	27.47	55	..	..	...	..	10	Cloudy	Detached clouds.
	July 30	7 a.m.	27.46	..	..	38	N.E.	2	1	Fair	Fair.
	July 30	2 p.m.	...	..	..	..	W.	6	4	Fair	Fair.
Nig Creek	July 30	9 p.m.	27.49	..	..	..	...	..	..	Fair	Strong west winds.
	July 31	7 a.m.	27.58	..	..	30	...	..	10	Light clouds	Ice on pails.
Trail down Nig Creek..	July 31	2 p.m.	...	..	..	..	S.	5	2	Fair	Fair.
Lower Nig Creek	July 31	9 p.m.	27.74	45	..	..	...	..	..	Fair	Fair.
	Aug. 1	7 a.m.	27.77	..	..	35	...	..	..	Fair	Clear.
	Aug. 1	2 p.m.	...	..	..	..	...	..	4	Detached clouds..	Fair.
	Aug. 1	9 p.m.	27.76	..	..	..	...	..	9	Fair, light	Fair.
	Aug. 2	7 a.m.	27.79	52	..	33	E.	1	9	Light clouds	Sky cleared at 10 p.m.
Trail to Summit	Aug. 2	2 p.m.	...	..	..	..	S.W.	4	2	Fair	Fair.
Camp	Aug. 2	9 p.m.	27.78	..	..	..	E.	1	10	Clouding	Close.
Camp on trail	Aug. 3	7 a.m.	27.72	58	..	53	...	..	10	Cloudy	Cloudy.
	Aug. 3	2 p.m.	27.82	74	..	..	N.W.	2	9	Clearing	Fair.

WEATHER RECORD—*Concluded.*

JUNE 14TH TO DECEMBER 31ST, 1913—*Continued.*

Place.	1913. Date.	1913. Hour.	Bar.	Thermometer. At Time	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
				Degs.	Degs.	Degs.					
Camp	Aug. 3	9 p.m.	27.84	..	..	..	...	..	1	Fair	Fair.
Prespatou Creek	Aug. 4	7 a.m.	27.87	60	..	41	E.	3	10	Misty	Fair.
Prespatau Valley	Aug. 4	2 p.m.	...	..	..	..	E.	2	..	Fair	Fair.
	Aug. 4	9 p.m.	27.89	..	..	..	...	..	..	Very fair	Fair.
Blueberry River Valley	Aug. 5	7 a.m.	27.85	..	..	41	...	..	1	Fair	Fair.
	Aug. 5	2 p.m.	...	..	..	..	...	..	3	Fair	Fair.
	Aug. 5	9 p.m.	27.69	..	..	..	...	..	..	Fair	Fair.
	Aug. 6	7 a.m.	27.75	..	..	40	W.	2	9	Slight rain	Cloudy.
	Aug. 6	2 p.m.	...	..	..	..	...	..	10	Rain, cloudy ...	Rain.
	Aug. 6	9 p.m.	27.64	..	..	..	S.W.	2	9	Clearing	Heavy rain all afternoon.
	Aug. 7	7 a.m.	27.66	..	..	45	S.W.	5	2	Clearing	Fair.
	Aug. 7	2 p.m.	...	..	..	..	S.W.	4	6	Clouding	Fair.
	Aug. 7	9 p.m.	28.06	..	..	..	...	..	..	Fair	Heavy rain all afternoon.
	Aug. 8	7 a.m.	28.08	..	..	38	S.W.	2	10	Rain, gloomy ...	Cloudy.
	Aug. 8	2 p.m.	...	..	..	..	S.	4	9	Clearing	Fair.
North Pine River	Aug. 8	9 p.m.	28.09	..	..	..	...	..	..	Very fair	Fair.
	Aug. 9	7 a.m.	27.52	..	..	34	...	..	1	Misty before sun-	Fair.
East of North Pine ...	Aug. 9	2 p.m.	...	..	..	..	...	..	6	Fair .....[rise	Fair.
	Aug. 9	9 p.m.	27.79	..	..	..	...	..	9	Clouding	Cloudy.
	Aug. 10	7 a.m.	27.73	..	..	..	S.W.	1	10	Rain	Rain at daylight.
	Aug. 10	2 p.m.	27.46	78	..	..	S.	4	9	Light showers ..	Fair.
Plateau country	Aug. 10	9 p.m.	27.54	..	..	..	...	..	9	Clearing	Cloudy.
East of North Pine ...	Aug. 11	7 a.m.	27.65	..	..	44	N.	2	10	Gloomy	Cloudy.
	Aug. 11	2 p.m.	...	..	..	..	N.E.	4	3	Fair	Fair.
	Aug. 11	9 p.m.	27.48	..	..	..	...	..	9	Dull	Clouding.
	Aug. 12	7 a.m.	27.53	..	..	..	...	..	10	Hazy	Fair.
	Aug. 12	2 p.m.	...	..	..	..	S.	2	3	Fair	Fair.
	Aug. 12	9 p.m.	27.48	..	..	..	...	..	1	Fair	Fair.
	Aug. 13	7 a.m.	27.49	..	..	..	...	..	4	Fair	Rains, early morning.
	Aug. 13	2 p.m.	...	..	..	..	S.	2	..	Fair	Fair.
	Aug. 13	9 p.m.	27.23	..	..	..	S.E.	2	9	Clouding	Fair.
	Aug. 14	7 a.m.	27.15	..	..	31	...	..	10	Fair	Ice on pails.
	Aug. 14	2 p.m.	...	..	..	..	N.	2	10	Rain	Cloudy.

	Aug. 14	9 p.m.	26.93	..	..	..	N.	2	10	Raining	Cold rain.
In vicinity of Summit..	Aug. 15	7 a.m.	27.00	..	..	44	N.	2	10	Raining	Rains during night.
	Aug. 15	2 p.m.	27.08	..	..	..	N.E.	6	10	Raining	Rains.
	Aug. 15	9 p.m.	27.18	..	..	..	S.	2	10	Cloudy	Rains at intervals.
	Aug. 16	7 a.m.	27.24	..	..	40	N.W.	2	10	Clearing	Cloudy.
	Aug. 16	2 p.m.	...	..	..	..	...	..	6	Fair	Part cloudy.
Summit Lake	Aug. 16	9 p.m.	27.05	..	..	..	...	..	..	Fair	Fair.
	Aug. 17	7 a.m.	27.03	..	..	35	S.	3	10	Misty	Fair.
	Aug. 17	2 p.m.	27.08	..	..	..	...	..	1	Fair	Fair.
	Aug. 17	9 p.m.	27.44	..	..	..	S.	1	1	Clearing	Showery in afternoon.
In vicinity of Summit..	Aug. 18	7 a.m.	27.39	..	..	34	...	..	8	Banked clouds ..	Dull.
	Aug. 18	2 p.m.	...	..	..	..	...	..	10	Cloudy	Cloudy.
	Aug. 18	9 p.m.	27.34	..	..	..	N.W.	2	10	Cloudy	Rain most of afternoon.
	Aug. 19	7 a.m.	27.24	..	..	36	S.W.	2	10	Gloomy	Cloudy.
	Aug. 19	2 p.m.	...	..	..	..	...	..	10	Cloudy	Cloudy.
	Aug. 19	9 p.m.	27.15	..	..	..	...	..	10	Cloudy	Cloudy.
	Aug. 20	7 a.m.	27.26	..	..	37	...	..	..	Fair, misty	Clearing.
	Aug. 20	2 p.m.	...	..	..	..	...	..	4	Fair	Fair.
	Aug. 20	9 p.m.	27.34	..	..	..	S.E.	3	..	Fair	Fair.
	Aug. 21	7 a.m.	27.36	..	..	44	N.W.	3	..	Fair	Clear, breeze north-westerly.
	Aug. 21	2 p.m.	...	..	..	..	...	..	2	Fair.	
	Aug. 21	9 p.m.	27.37	..	..	..	...	..	..	Fair	Passing thunder.
	Aug. 22	7 a.m.	27.38	..	..	31	...	..	..	Fair	Fair.
	Aug. 22	2 p.m.	...	..	..	..	S.	3	..	Fair	Fair.
	Aug. 22	9 p.m.	27.50	..	..	..	N.	2	6	Fair	Fair.
Valley of North Pine..	Aug. 23	7 a.m.	27.33	..	..	41	N.W.	2	10	Fair	Cloudy.
	Aug. 23	2 p.m.	...	..	..	..	...	..	10	Cloudy	Cloudy.
	Aug. 23	9 p.m.	27.38	..	..	..	W.	9	1	Thunder, dark	Showery, clear at 4.30.
	Aug. 24	7 a.m.	27.46	..	..	35	W.	4	3	„ [clouds	Fair.
	Aug. 24	2 p.m.	...	..	..	..	S.W.	8	1	„	Fair.
	Aug. 24	9 p.m.	27.54	..	..	..	...	..	1	„	Windy.
	Aug. 25	7 a.m.	27.50	..	..	32	...	..	2	„	Fair.
	Aug. 25	2 p.m.	...	..	..	..	S.	3	6	Fair	Fair.
	Aug. 25	9 p.m.	27.28	..	..	..	S.W.	3	8	Clearing	Cloudy.
	Aug. 26	7 a.m.	27.23	..	..	49	S.W.	2	..	Fair	Fair.
	Aug. 26	2 p.m.	...	..	..	..	S.W.	6	5	Fair	Fair.
Upper North Pine Crossing	Aug. 26	9 p.m.	27.54	..	..	..	W.	1	..	Fair	Westerly winds.
	Aug. 27	7 a.m.	27.60	..	..	33	...	..	..	Fair	Fair.
	Aug. 27	2 p.m.	...	..	..	..	S.W.	2	9	Cloudy	Fair.
	Aug. 27	9 p.m.	27.62	..	..	..	W.	2	..	Cloudy	Fair.
	Aug. 28	7 a.m.	27.65	..	..	36	W.	7	2	Cloudy	Fair.
	Aug. 28	2 p.m.	...	..	..	..	W.	6	2	Cloudy	Fair.
	Aug. 28	9 p.m.	27.67	..	..	..	W.	1	9	Cloudy	Fair.
	Aug. 29	7 a.m.	27.75	..	..	41	...	..	..	Cloudy	Fair.

WEATHER RECORD—*Continued.*

JUNE 14TH TO DECEMBER 31ST, 1913—*Continued.*

Place.	1913. Date.	1913. Hour.	Bar.	Thermometer. At Time	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
				Degs.	Degs.	Degs.					
Train north to Sikanni River	Aug. 29	2 p.m.	...	..	..	..	W.	2	2	Fair	Fair.
	Aug. 29	9 p.m.	27.54	..	..	..	...	..	..	Very fair	Fair.
	Aug. 30	7 a.m.	27.38	..	..	28	...	..	2	Very fair	Fair.
	Aug. 30	2 p.m.	...	..	..	..	S.W.	2	4	Clouding	Fair.
	Aug. 30	9 p.m.	26.98	..	..	..	S.E.	3	10	Rain	Started to rain at 4.30.
Summit on Nelson Trail	Aug. 31	7 a.m.	26.95	..	..	41	...	..	10	Gloomy	Rains all night.
	Aug. 31	2 p.m.	...	..	..	..	...	..	10	Cloudy	Rain at noon.
	Aug. 31	9 p.m.	26.38	..	..	..	N.	1	..	Fair	Clearing.
	Sept. 1	7 a.m.	26.44	..	..	26	...	..	9	First snow fell	¼ inch ice on pail.
	Sept. 1	2 p.m.	...	..	..	..	N.	3	3	during night	Fair, leaves turned colour.
North to Sikanni River	Sept. 1	9 p.m.	26.90	..	..	..	N.	1	..	Fair.	
	Sept. 2	7 a.m.	26.97	..	..	25	...	..	6	Fair	Fair, frosty.
	Sept. 2	2 p.m.	...	..	..	..	N.	3	8	Gloomy	Cloudy.
	Sept. 2	9 p.m.	27.54	..	..	..	N.	3	10	Rain	Cloudy.
	Sept. 3	7 a.m.	27.35	..	..	35	N.E.	2	10	Rain	Rain all night.
	Sept. 3	2 p.m.	...	..	..	..	N.	2	10	Rain	Rain all day.
	Sept. 3	9 p.m.	27.34	..	..	..	N.	1	10	Clearing	Cold rain.
	Sept. 4	7 a.m.	27.25	..	..	34	...	..	10	Misty	Wet snow.
	Sept. 4	2 p.m.	...	..	..	..	S.	5	10	Misty	Snowed till noon.
	Sept. 4	9 p.m.	27.46	..	..	..	...	..	10	Cloudy	Snow disappears.
	Sept. 5	7 a.m.	27.54	..	..	36	S.E.	2	10	Gloomy, clearing	Cloudy.
	Sept. 5	2 p.m.	...	..	..	..	...	..	9	Gloomy, clearing	Cloudy.
	Sept. 5	9 p.m.	27.84	..	..	..	...	..	..	Fair	Fair.
Conroy Creek	Sept. 6	7 a.m.	27.92	..	..	32	...	..	10	Rainbows & cloud	Cloudy.
	Sept. 6	2 p.m.	...	..	..	..	...	..	8	Heavy rain	Rain commenced at 7.30.
	Sept. 6	9 p.m.	28.23	..	..	..	...	..	..	Fair	Fair, clearing.
	Sept. 7	7 a.m.	28.21	..	..	29	S.E.	3	6	Fair	Clear at 8 a.m.
Trail north-west to Sikanni River	Sept. 7	2 p.m.	...	..	..	..	S.E.	2	9	Cloudy	Fair.
	Sept. 7	9 p.m.	27.89	..	..	..	S.E.	1	6	Dull, fair	Fair.
	Sept. 8	7 a.m.	27.69	..	..	34	...	..	10	Fair	Fair.
	Sept. 8	2 p.m.	...	..	..	..	S.	3	8	Fair	Fair.
	Sept. 8	9 p.m.	27.32	..	..	..	N.	3	10	Clearing	Rain 4.30 to 6.30.
	Sept. 9	7 a.m.	27.29	..	..	34	S.W.	3	10	Fair	Fair.

	Sept. 9	2 p.m.	...	..	..	..	...	..	6	Fair	Fair.
Sikanni River	Sept. 9	9 p.m.	28.16	..	..	..	S.W.	2	4	Detached clouds..	Fair.
	Sept. 10	7 a.m.	28.46	..	..	36	...	..	..	Fair	Showers at 5 a.m.
	Sept. 10	2 p.m.	28.53	..	..	..	S.W.	2	2	Fair.	
	Sept. 10	9 p.m.	28.54	..	..	..	...	..	9	Fair	Foliage changing colour.
	Sept. 11	7 a.m.	28.60	..	..	30	...	..	1	Fair	Fair.
Nelson Trail	Sept. 11	2 p.m.	...	..	..	..	S.W.	2	2	Fair	Fair.
Sikanni to North Pine	Sept. 11	9 p.m.	27.66	..	..	..	...	..	1	Fair	Fair.
	Sept. 12	7 a.m.	27.54	..	..	31	...	..	1	Light cirrus clouds	Fair.
	Sept. 12	2 p.m.	...	..	..	..	E.	2	2	Light cirrus clouds	Fair.
	Sept. 12	9 p.m.	27.70	..	..	..	E.	1	10	Light cirrus clouds	Fair.
Nelson Trail	Sept. 13	7 a.m.	27.70	..	..	35	S.E.	1	9	Cloudy	Cloudy.
Sikanni to North Pine	Sept. 13	2 p.m.	...	..	..	..	N.W.	4	5	Fair	Fair.
River	Sept. 13	9 p.m.	27.61	..	..	..	...	..	1	Light cirrus clouds	Strong north-west winds.
	Sept. 14	7 a.m.	27.62	..	..	21	...	..	1	Fair	Fair.
	Sept. 14	2 p.m.	...	..	..	..	S.W.	3	..	Fair	Fair.
	Sept. 14	9 p.m.	26.80	..	..	..	S.W.	2	1	Fair	Very fair, clear.
Summit (north side) to	Sept. 15	7 a.m.	26.83	..	..	34	S.W.	1	1	Fair	Frost south side of summit.
North Pine	Sept. 15	2 p.m.	...	..	..	..	S.W.	1	1	Very fair	Clear view of Rocky Moun-
	Sept. 15	9 p.m.	27.33	..	..	..	S.W.	3	2	Very fair	Fair. [tains to north.
	Sept. 16	7 a.m.	27.26	..	..	28	N.E.	4	10	Fair	Cloudy.
	Sept. 16	2 p.m.	...	..	..	..	S.W.	4	6	Cloudy	Cloudy.
North Pine River	Sept. 16	9 p.m.	27.44	..	..	..	S.	2	5	Fair	Fair.
	Sept. 17	7 a.m.	27.46	..	..	35	S.	1	10	Fair	Fair.
	Sept. 17	2 p.m.	...	..	..	..	S.W.	2	4	Fair	Fair.
	Sept. 17	9 p.m.	27.47	..	..	..	...	..	9	Cloudy	Fair.
	Sept. 18	7 a.m.	27.53	..	..	35	...	..	9	Light rain	Fair.
North Pine to Sikanni	Sept. 18	2 p.m.	...	..	..	..	S.W.	2	1	Very fair	Fair.
River	Sept. 18	9 p.m.	27.64	..	..	..	...	..	9	Very fair	Fair.
	Sept. 19	7 a.m.	27.69	..	..	20	N.	1	10	Hazy clouds	Fair.
	Sept. 19	2 p.m.	...	..	..	..	N.E.	2	10	Fair	Clear at 11 a.m.
	Sept. 19	9 p.m.	27.39	..	..	..	...	..	10	Fair, hazy	Fair.
Summit	Sept. 20	7 a.m.	27.37	..	..	27	...	..	10	Misty	Fog.
	Sept. 20	2 p.m.	...	..	..	..	...	..	10	Rain	Drizzling rain commenced at
North to Sikanni River	Sept. 20	9 p.m.	26.86	..	..	..	S.	4	10	Cloudy	noon till 3 p.m.
	Sept. 21	7 a.m.	26.60	..	..	32	N.	2	10	Misty	Cloudy.
	Sept. 21	2 p.m.	...	..	..	..	N.	2	1	Fair	Slight fall; clears at 11 a.m.
	Sept. 21	9 p.m.	27.50	..	..	..	N.	2	1	Fair.	
	Sept. 22	7 a.m.	27.81	..	..	27	...	..	10	Cloudy	1 inch snow falls during
	Sept. 22	2 p.m.	...	..	..	..	...	..	1	Fair	night; disappears in after-
	Sept. 22	9 p.m.	28.06	..	..	..	N.	1	6	Fair	noon.
	Sept. 23	7 a.m.	28.05	..	..	24	...	..	8	Fair	Fair.
	Sept. 23	2 p.m.	...	..	..	..	S.W.	1	..	Fair	Fair.
Conroy Creek	Sept. 23	9 p.m.	28.22	..	..	..	W.	1	..	Fair	Fair.
	Sept. 24	7 a.m.	28.22	..	..	29	S.E.	2	..	Very fair	Fair.

WEATHER RECORD—*Continued.*

JUNE 14TH TO DECEMBER 31ST, 1913—*Continued.*

Place.	1913.		Bar.	Thermometer.			Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
	Date.	Hour.		At Time	Max.	Min.					
				Degs.	Degs.	Degs.					
Conroy Creek	Sept. 24	2 p.m.	...	..	..	..	...	..	..	Very fair	Fair.
Trail north-west to Sikanni River	Sept. 24	9 p.m.	27.49	..	..	..	...	..	..	Very fair	Fair.
	Sept. 25	7 a.m.	27.59	..	..	26	...	..	..	Very fair	Fair.
	Sept. 25	2 p.m.	...	..	..	..	S.W.	1	..	Very fair	Warm, clear day.
	Sept. 25	9 p.m.	27.86	..	..	..	...	..	..	Very fair	Fair.
Nelson Trail to Sikanni	Sept. 26	7 a.m.	27.87	..	..	29	S.W.	1	4	Fair	Fair.
	Sept. 26	2 p.m.	...	..	..	..	W.	1	6	Cloudy	Fair.
Temporary winter quarters, Sikanni River	Sept. 26	9 p.m.	28.21	..	..	..	...	..	9	Cloudy	Fair.
	Sept. 27	7 a.m.	28.26	..	..	34	S.	2	6	Dull	Cloudy.
	Sept. 27	2 p.m.	*	..	..	..	S.	2	5	Light cirrus clouds	Cloudy.
Valley of Sikanni River	Sept. 27	9 p.m.	*	..	..	..	S.	2	4	Fair	Fair.
	Sept. 28	7 a.m.	*	..	..	36	S.W.	4	8	Light rain	Cloudy.
	Sept. 28	2 p.m.	*	..	..	..	S.W.	8	2	Fair	Windy.
	Sept. 28	9 p.m.	28.14	..	..	..	S.W.	2	..	Fair	Fair.
	Sept. 29	7 a.m.	28.26	..	..	35	...	..	..	Very fair	Fair.
	Sept. 29	2 p.m.	...	..	..	..	S.W.	3	5	Fair	Fair.
	Sept. 29	9 p.m.	28.31	..	..	..	W.	1	1	Fair	Fair.
	Sept. 30	7 a.m.	28.48	..	..	36	...	..	..	Very fair	Fair.
	Sept. 30	2 p.m.	...	..	..	..	S.W.	4	6	Fair	Fair.
	Sept. 30	9 p.m.	28.40	..	..	..	S.	1	4	Fair	Fair.
	Oct. 1	7 a.m.	28.35	..	..	40	S.W.	1	..	Very fair	Fair.
	Oct. 1	2 p.m.	28.30	..	..	..	S.W.	8	1	Very fair	South-west winds.
	Oct. 1	9 p.m.	28.22	..	..	..	W.	6	..	Very fair	Squally.
	Oct. 2	7 a.m.	28.30	..	..	28	...	..	..	Very fair	Fair.
	Oct. 2	2 p.m.	28.35	..	..	..	W.	1	4	Fair	Fair.
	Oct. 2	9 p.m.	28.36	..	..	..	S.W.	1	6	Fair	Fair.
	Oct. 3	7 a.m.	28.66	..	..	33	...	..	10	Cloudy	Slight fall of sleet.
	Oct. 3	2 p.m.	28.70	..	..	..	N.W.	1	8	Cloudy	Fair.
	Oct. 3	9 p.m.	28.75	..	..	..	...	..	..	Fair	Fair.
	Oct. 4	7 a.m.	28.83	..	..	26	...	..	..	Very fair	Fair, warm.
	Oct. 4	2 p.m.	28.73	..	..	..	N.	1	..	Very fair	Beautiful day.
	Oct. 4	9 p.m.	28.66	..	..	..	S.W.	1	5	Fair	Beautiful day.

* Barometer left at camp, not taken.

	Oct. 5	7 a.m.	28.60	..	..	25	...	..	..	Very fair	Fair.
	Oct. 5	2 p.m.	28.54	..	..	..	N.W.	2	6	Very fair	Fair.
	Oct. 5	9 p.m.	28.47	..	..	..	N.W.	1	8	Fair	Slight fall of snow.
	Oct. 6	7 a.m.	28.50	..	..	30	N.W.	1	10	Cloudy	Ground whitened.
	Oct. 6	2 p.m.	28.53	..	..	..	S.W.	1	4	Light cirrus clouds (drift south-west)	Snow disappeared at noon.
	Oct. 6	9 p.m.	28.54	..	..	..	W.	1	..	Fair	Fair.
	Oct. 7	7 a.m.	28.45	..	..	24	...	..	1	Very fair	Fair.
	Oct. 7	2 p.m.	28.40	..	..	..	N.W.	2	5	Fair	Fair.
	Oct. 7	9 p.m.	28.27	..	..	..	N.E.	2	10	Cloudy	Clouding.
	Oct. 8	7 a.m.	28.30	..	..	28	E.	2	10	Fair	Fair.
	Oct. 8	2 p.m.	28.35	..	..	..	E.	1	5	Fair	Fair.
	Oct. 8	9 p.m.	28.34	..	..	..	N.W.	1	7	Fair	Fair.
Temporary winter quarters, Sikanni Chief River	Oct. 9	7 a.m.	28.38	..	..	28	N.W.	2	10	.....	Started to snow at 10 a.m. to 1 p.m.
	Oct. 9	2 p.m.	28.40	..	..	..	N.	2	1	....	
	Oct. 9	9 p.m.	28.40	..	..	..	...	..	..	Fair	Snow thawed in afternoon.
	Oct. 10	7 a.m.	28.36	..	..	17	...	..	1	Fair	Fair.
	Oct. 10	2 p.m.	28.34	..	..	..	N.	1	5	Fair	Fair.
	Oct. 10	9 p.m.	28.34	..	..	..	N.W.	2	10	Cloudy	Fair.
Camp on timbered river flat of approximate elevation of 1,600 feet above sea-level	Oct. 11	7 a.m.	28.23	..	..	28	N.E.	2	10	Fine snow	Cloudy.
	Oct. 11	2 p.m.	28.24	..	..	..	N.	1	10	21 inches snow on	Snowing.
	Oct. 11	9 p.m.	28.26	..	..	..	N.W.	1	10	Cloudy .. [ground	Stopped snowing about 2 p.m., 2 inches.
	Oct. 12	7 a.m.	28.43	..	..	22	N.E.	1	10	Light snowfall ..	
	Oct. 12	2 p.m.	28.42	..	..	..	N.	2	10	Dull	Stopped snowing at noon.
	Oct. 12	9 p.m.	28.43	..	..	..	N.W.	1	9	Clearing	Cloudy.
	Oct. 13	7 a.m.	28.48	..	..	21	N.	1	10	Fair	Cloudy.
	Oct. 13	2 p.m.	28.50	..	..	..	N.W.	1	9	Clearing	Cloudy.
	Oct. 13	9 p.m.	28.47	..	..	..	...	..	1	Fair	Fair.
	Oct. 14	7 a.m.	28.50	..	..	17	N.	1	8	Fair	Fair.
	Oct. 14	2 p.m.	...	..	..	..	...	..	4	Fair	Fair.
	Oct. 14	9 p.m.	28.50	..	..	..	...	..	4	Fair	Fair.
	Oct. 15	7 a.m.	28.47	..	..	16	N.W.	2	8	Fair	Fair.
	Oct. 15	2 p.m.	28.40	..	..	..	N.W.	2	4	Fair	Fair.
	Oct. 15	9 p.m.	28.45	..	..	..	N.W.	2	6	Fair	Fair.
	Oct. 16	7 a.m.	28.61	..	..	24	S.W.	2	8	Fair	Fair.
	Oct. 16	2 p.m.	...	..	..	..	W.	2	1	Fair	Fair.
	Oct. 16	9 p.m.	28.40	..	..	..	N.W.	1	6	Fair	Slight thaw.
	Oct. 17	7 a.m.	28.45	..	..	19	N.W.	2	6	Fair	Fair.
	Oct. 17	2 p.m.	28.50	..	..	..	N.W.	2	4	Fair	Fair.
	Oct. 17	9 p.m.	28.71	..	..	..	W.	2	2	Fair	Fair.
	Oct. 18	7 a.m.	28.92	..	..	20	S.W.	2	9	Cloudy	Clouding.
	Oct. 18	2 p.m.	28.88	..	..	..	N.	2	9	Dull	Cloudy.
	Oct. 18	9 p.m.	28.85	..	..	..	N.	1	10	Snowing	Cloudy.
	Oct. 19	7 a.m.	28.65	..	..	20	...	..	10	Fair, cloudy	Snow, 2 inches, during night.
	Oct. 19	2 p.m.	28.50	..	..	..	W.	2	10	Fair, cloudy.	

WEATHER RECORD—*Continued.*

JUNE 14TH TO DECEMBER 31ST, 1913—*Continued.*

Place.	1913. Date.	1913. Hour.	Bar.	Thermometer. At Time	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
				Degs.	Degs.	Degs.					
Camp on timbered river flat of approximate elevation of 1,600 feet above sea-level	Oct. 19	9 p.m.	28.33	..	..	..	...	..	10	Cloudy.	[all off trees.
	Oct. 20	7 a.m.	27.90	..	..	30	S.W.	2	10	Cloudy	Rains during night and snow
	Oct. 20	2 p.m.	28.00	..	..	..	S.W.	6	22	Chinook winds ..	Snow fast disappearing.
	Oct. 20	9 p.m.	28.14	..	..	..	W.	2	..	Fair	Fair.
	Oct. 21	7 a.m.	28.38	..	..	21	S.W.	1	4	Very fair	Fair.
	Oct. 21	2 p.m.	28.38	..	..	..	W.	1	1	Fair	Fair.
	Oct. 21	9 p.m.	...	..	..	..	...	..	..	.....	Sleet during night.
	Oct. 22	7 a.m.	27.86	..	..	30	S.	1	10	Cloudy	Sleet during night.
	Oct. 22	2 p.m.	27.77	..	..	..	S.W.	1	10	Dull	Cloudy.
	Oct. 22	9 p.m.	27.91	..	..	..	W.	1	..	Cloudy	Cloudy.
	Oct. 23	7 a.m.	28.13	30	..	29	S.W.	1	..	Fair	Fair.
	Oct. 23	2 p.m.	28.21	44	..	..	W.	8	..	Fair	Chinook winds.
	Oct. 23	9 p.m.	28.24	34	..	..	W.	4	..	Fair	Chinook winds.
	Oct. 24	7 a.m.	28.50	29	..	25	N.W.	1	8	Fair	Fair.
	Oct. 24	2 p.m.	28.64	38	..	..	...	..	6	Fair	Fair.
	Oct. 24	9 p.m.	28.72	33	..	..	N.W.	1	..	Fair	Fair.
	Oct. 25	7 a.m.	28.72	21	..	20	N.	2	..	Fair	Fair.
	Oct. 25	2 p.m.	28.65	32	..	..	N.W.	1	10	Light cirrus clouds	Very fair.
	Oct. 25	9 p.m.	28.58	29	..	..	...	..	..	Very fair	Fair.
	Oct. 26	7 a.m.	28.22	23	..	22	N.	2	10	Snowing	Snow, 2 inches, during night.
	Oct. 26	2 p.m.	28.24	25	..	..	N.	1	10	Dull	Snow till 1 p.m., 4 inches.
	Oct. 26	9 p.m.	28.38	20	..	..	N.	2	10	Cloudy	Cloudy.
Camp on timbered river flat at approximate elevation of 1,600 feet above sea-level on Sikanni Chief River	Oct. 27	7 a.m.	28.73	14	..	13	N.W.	1	10	Cloudy	Cloudy.
	Oct. 27	2 p.m.	28.80	18	..	..	N.W.	2	10	Cloudy	Slight snowfall.
	Oct. 27	9 p.m.	28.80	14	..	..	...	..	10	Cloudy	Slight snowfall.
	Oct. 28	7 a.m.	28.65	10	..	10	N.	1	10	Cloudy	Fine dry snow.
	Oct. 28	2 p.m.	28.58	20	..	..	N.W.	1	9	Cloudy	Cloudy.
	Oct. 28	9 p.m.	28.70	10	..	..	...	..	..	Fair	Little snow.
	Oct. 29	7 a.m.	28.76	—4	..	—5	...	..	..	Fair	Fair.
	Oct. 29	2 p.m.	28.70	16	..	..	...	..	..	Very fair	Fair.
	Oct. 29	9 p.m.	28.68	6	..	..	...	..	..	Very fair	Fair.
	Oct. 30	7 a.m.	28.76	16	..	5	...	..	4	Fair	Fair.
	Oct. 30	2 p.m.	28.50	22	..	..	...	..	..	Fair	Fair.

	Oct. 30	9 p.m.	28.36	12	..	..	N.	1	..	Fair	Fair.
	Oct. 31	7 a.m.	28.32	4	..	..	...	..	..	....	Fair.
	Oct. 31	2 p.m.	28.23	20	..	..	...	..	..	Fair	Fair.
	Oct. 31	9 p.m.	28.35	11	..	..	N.W.	1	2	Fair	Fair.
	Nov. 1	8 a.m.	28.46	14	..	13	S.W.	2	1	Fair	Fair.
	Nov. 1	2 p.m.	28.47	31	..	..	S.	2	..	Fair	Fair.
	Nov. 1	8 p.m.	28.50	19	..	..	...	..	..	Fair	Fair.
	Nov. 2	8 a.m.	28.40	12	..	10	S.	1	..	Fair	Fair.
	Nov. 2	2 p.m.	28.20	24	..	..	S.W.	1	2	Fair	Fair.
	Nov. 2	8 p.m.	28.27	23	..	..	...	..	9	Cloudy	Fair.
	Nov. 3	8 a.m.	28.15	25	..	16	S.W.	2	6	Cloudy	Fair.
	Nov. 3	2 p.m.	28.05	33	..	..	S.E.	2	9	Cloudy	Warm south-westerly winds.
	Nov. 3	8 p.m.	27.90	28	..	..	S.E.	1	9	Cloudy.	
	Nov. 4	8 a.m.	27.85	27	..	16	W.	2	9	Cloudy	Cloudy.
	Nov. 4	2 p.m.	27.90	34	..	..	W.	2	6	Fair	Fair.
	Nov. 4	8 p.m.	27.96	30	..	..	S.E.	2	8	Fair	Fair.
	Nov. 5	8 a.m.	28.00	17	..	13	S.	1	4	Fair	Fair.
	Nov. 5	2 p.m.	28.01	30	..	..	S.W.	1	10	Fair	Fair.
	Nov. 5	8 p.m.	27.98	24	..	..	...	..	9	Cloudy	Fair.
	Nov. 6	8 a.m.	28.17	11	..	9	S.	1	10	Cloudy	Cloudy.
	Nov. 6	2 p.m.	28.20	20	..	..	...	..	10	Cloudy	Cloudy.
	Nov. 6	8 p.m.	28.42	18	..	..	S.W.	1	10	Cloudy	Cloudy.
	Nov. 7	8 a.m.	28.70	24	..	9	S.	1	..	Fair	Slight snowfall, ¼ inch.
	Nov. 7	2 p.m.	28.70	28	..	..	S.W.	1	..	Very fair	Fair.
	Nov. 7	8 p.m.	28.72	20	..	..	...	..	9	Fair	Fair.
	Nov. 8	8 a.m.	28.70	18	..	18	...	..	10	Fine dry snow ..	Commenced to snow early in
	Nov. 8	2 p.m.	28.60	22	..	..	S.	1	9	Fair	Cloudy. [afternoon.
	Nov. 8	8 p.m.	28.30	23	..	..	...	..	10	Cloudy.	Dull.
	Nov. 9	8 a.m.	28.00	21	..	19	...	..	6	Cirrus clouds ...	Cloudy.
	Nov. 9	2 p.m.	28.02	22	..	..	S.E.	1	8	G. stratus clouds	Cloudy.
	Nov. 9	8 p.m.	28.12	14	..	..	...	..	8	G. stratus clouds	Fair.
	Nov. 10	8 a.m.	28.12	10	..	6	S.W.	1	1	Fair	Fair.
	Nov. 10	2 p.m.	28.08	20	..	..	...	..	..	Fair	Fair.
	Nov. 10	8 p.m.	28.25	20	..	..	N.	1	10	Light snow	Fair.
	Nov. 11	8 a.m.	28.45	22	..	19	S.W.	1	10	Cloudy	Cloudy.
	Nov. 11	2 p.m.	28.47	23	..	..	...	..	6	Fair	Fair.
	Nov. 11	8 p.m.	28.50	20	..	..	N.	1	9	Fair	Fair.
	Nov. 12	8 a.m.	28.45	5	..	4	S.W.	1	1	Very fair	Fair.
	Nov. 12	2 p.m.	28.32	21	..	..	S.	2	4	Fair	Fair.
	Nov. 12	8 p.m.	28.26	10	..	..	N.	2	7	Fair	Fair.
Flats at approximate elevation of 1,600 feet	Nov. 13	8 a.m.	28.35	15	..	11	...	..	2	Cirrus cloud	Fair.
	Nov. 13	2 p.m.	28.35	27	..	..	...	..	4	Fair	Fair.
	Nov. 13	8 p.m.	28.34	20	..	..	...	..	1	Very fair	Clear weather.
	Nov. 14	8 a.m.	28.19	11	..	9	...	..	5	Fair	Fair.
	Nov. 14	2 p.m.	27.80	26	..	..	S.	1	10	Cloudy	Fair.

WEATHER RECORD—*Continued.*

JUNE 14TH TO DECEMBER 31ST, 1913—*Continued.*

Place.	1913. Date.	1913. Hour.	Bar.	Thermometer. At Time	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
				Degs.	Degs.	Degs.					
Flats at approximate elevation of 1,600 feet	Nov. 14	8 p.m.	27.66	20	..	..	S.	5	10	Fair	Fair.
	Nov. 15	8 a.m.	27.60	22	..	11	S.	2	1	Fair	Windy during night.
	Nov. 15	2 p.m.	27.80	26	..	..	S.W.	2	5	Fair	Fair.
	Nov. 15	8 p.m.	27.92	21	..	..	N.	4	10	Fair	Fair.
	Nov. 16	8 a.m.	28.17	12	..	11	N.	5	10	Cold north wind..	Fair.
	Nov. 16	2 p.m.	28.28	11	..	..	N.	3	2	Light snow	Cloudy.
	Nov. 16	8 p.m.	28.45	..	..	..	N.	2	10	Cloudy	Cloudy.
Temporary winter quarters, Sikanni Chief River	Nov. 17	8 a.m.	28.55	2	..	2	N.	1	8	Slight snow	Slight snowfall.
	Nov. 17	2 p.m.	28.56	3	..	..	...	..	6	Fair	Fair.
	Nov. 17	8 p.m.	28.48	— 2	..	..	...	..	2	Fair	Fair.
	Nov. 18	8 a.m.	28.10	—17	..	—19	...	..	3	Fair	Fair.
Camp on timbered river	Nov. 18	2 p.m.	27.92	60	..	..	N.E.	1	9	Fair	Clear cold weather.
	Nov. 18	8 p.m.	27.64	..	..	..	...	..	6	Fair	Clear cold weather.
Flats at approximate elevation of 1,600 feet	Nov. 19	8 a.m.	27.53	10	..	..	E.	5	4	Fair	Squally.
	Nov. 19	2 p.m.	27.64	18	..	..	N.	2	10	Fair.	
	Nov. 19	8 p.m.	27.84	11	..	..	N.	4	10	Fine particles of	Starts snowing at 7 p.m.
	Nov. 20	8 a.m.	28.20	+ 3	..	+ 2	...	..	2	Fair .....[snow	Snow.
	Nov. 20	2 p.m.	28.20	11	..	..	...	..	6	Fair	Fair.
	Nov. 20	8 p.m.	28.15	..	..	..	...	..	1	Fair	Fair.
River froze over about this time	Nov. 21	8 a.m.	28.50	—14	..	—17	...	..	..	Fair	Fair.
	Nov. 21	2 p.m.	28.04	— 1	..	..	N.	1	..	Fair	Fair.
	Nov. 21	8 p.m.	27.96	—12	..	..	N.	1	..	Fair	Beautiful sunny day.
	Nov. 22	8 a.m.	27.95	— 5	..	—13	...	..	8	Cloudy	Fair.
	Nov. 22	2 p.m.	27.95	+ 6	..	..	...	..	8	Clearing	Clear weather.
	Nov. 22	8 p.m.	28.05	..	..	..	...	..	..	Fair	Cold, clear weather.
	Nov. 23	8 a.m.	28.23	— 3	..	— 5	...	..	1	Fair	Clear cold weather.
	Nov. 23	2 p.m.	28.25	+ 8	..	..	...	..	4	Fair	Clear cold weather.
	Nov. 23	8 p.m.	28.27	..	..	..	...	..	..	Fair	Clear cold weather.
	Nov. 24	8 a.m.	28.29	— 2	..	— 5	S.	1	8	Fair	Fair.
	Nov. 24	2 p.m.	28.26	+ 6	..	..	S.	1	..	Fair	Fair.
	Nov. 24	8 p.m.	28.18	— 3	..	..	N.W.	1	4	Fair	Fair.
	Nov. 25	8 a.m.	28.06	+ 6	..	— 3	N.	1	10	Cloudy	Snow, 1 inch, during night.
	Nov. 25	2 p.m.	28.02	+16	..	..	N.E.	2	8	Gloomy	Cloudy.

	Nov. 25	8 p.m.	27.98	+10	..	..	N.	3	10	Light snow	Cloudy.
	Nov. 26	8 a.m.	28.07	11	..	+11	N.E.	1	4	Fair	Cloudy.
	Nov. 26	2 p.m.	28.02	13	..	..	N.E.	2	10	Cloudy	Cloudy.
	Nov. 26	8 p.m.	27.93	12	..	..	N.E.	3	10	Cloudy	Cloudy.
	Nov. 27	8 a.m.	27.94	7	..	+ 7	N.E.	2	10	Cloudy	Cloudy.
	Nov. 27	2 p.m.	28.02	4	..	1	N.	1	2	Fair	Fair.
	Nov. 27	8 p.m.	28.02	4	..	..	N.	1	2	Fair	Fair.
	Nov. 28	8 a.m.	28.13	+ 3	..	− 4	...	..	8	Light clouds	Fair.
	Nov. 28	2 p.m.	28.14	12	..	..	...	..	4	Light clouds	Fair.
	Nov. 28	8 p.m.	28.15	..	..	..	S.	3	2	Fair	Fair.
	Nov. 29	8 a.m.	28.13	+ 2	..	− 4	N.W.	2	10	Cloudy	Fair.
	Nov. 29	2 p.m.	28.14	8	..	..	N.W.	2	10	Cloudy	Light fall of fine dry snow
	Nov. 29	8 p.m.	28.15	3	..	..	N.	1	4	Fair	during afternoon.
Temporary winter quarters, Sikanni Chief River	Nov. 30	8 a.m.	28.23	14	..	−13	N.	1	8	Dull	Cloudy (raw cold).
	Nov. 30	2 p.m.	28.24	..	..	..	N.	1	10	Cloudy	Cloudy.
	Nov. 30	8 p.m.	28.25	..	..	..	N.	1	..	Fair.	
	Dec. 1	8 a.m.	28.26	..	..	− 6	N.W.	1	..	Fair	South-west breeze.
Camp on timbered river flats at approximate elevation of 1,600 feet	Dec. 1	2 p.m.	28.08	20	..	..	S.W.	6	2	Fair	High winds.
	Dec. 1	8 p.m.	27.94	46	..	..	S.W.	10	6	Chinook wind ...	High south-west wind.
	Dec. 2	8 a.m.	28.30	28	..	+28	S.W.	2	10	Chinook wind ...	All snow taken off trees.
	Dec. 2	2 p.m.	28.94	33	..	..	S.W.	1	4	Mild	Chinook wind.
	Dec. 2	8 p.m.	28.02	26	..	..	S.W.	2	..	Mild	Chinook wind.
	Dec. 3	8 a.m.	28.00	32	..	26	S.W.	5	4	Chinook wind ...	Chinook wind.
	Dec. 3	2 p.m.	28.04	40	..	..	S.W.	4	2	Very mild	Exposed hills cleared of snow
	Dec. 3	8 p.m.	28.22	32	..	..	S.W.	1	..	Very mild	by warm winds.
	Dec. 4	8 a.m.	28.50	29	..	26	S.	1	10	Cloudy	Windy during night.
	Dec. 4	2 p.m.	28.50	32	..	..	S.	2	10		
	Dec. 4	8 p.m.	28.44	32	..	..	S.	1	10	Snowing	Starts snowing at 4 p.m.
	Dec. 5	8 a.m.	28.70	22	..	22	S.	1	10	Cloudy	Snowed, 1 inch (windy).
	Dec. 5	2 p.m.	28.83	25	..	..	S.W.	2	5	Fair	Fair.
	Dec. 5	8 p.m.	28.94	+ 6	..	..	...	..	..	Fair	Fair.
	Dec. 6	8 a.m.	28.66	20	..	+ 2	S.	6	10	Squally	Windy during night.
	Dec. 6	2 p.m.	28.40	24	..	..	S.	8	10	Windy	Windy.
	Dec. 6	8 p.m.	28.30	26	..	..	S.	4	10	Fair	Fair.
	Dec. 7	8 a.m.	28.15	12	..	12	...	..	..	Very fair	Fair.
	Dec. 7	2 p.m.	28.20	19	..	..	S.	3	..	Fair	Fair.
	Dec. 7	8 p.m.	28.24	18	..	..	S.W.	1	..	Fair	Fair.
	Dec. 8	8 a.m.	28.19	40	..	14	S.W.	8	6	Chinook winds ..	Strong south-west gale during night.
	Dec. 8	2 p.m.	28.19	42	..	..	S.W.	8	..	Chinook winds ..	Strong Chinook wind.
	Dec. 8	8 p.m.	28.23	28	..	..	S.	1	8	Fair	Thawing.
	Dec. 9	8 a.m.	28.07	34	..	27	S.W.	4	10	Warm winds	Warm winds.
	Dec. 9	2 p.m.	28.04	40	..	..	S.W.	4	9	Cloudy	Cloudy.
	Dec. 9	8 p.m.	28.09	39	..	..	S.W.	6	9	Cloudy	Cloudy.
	Dec. 10	8 a.m.	27.89	45	..	27	S.W.	7	..	Fair	Strong Chinook wind all night.
	Dec. 10	2 p.m.	27.95	48	..	..	S.W.	6	..	Fair	Warm south-west Chinooks.

WEATHER RECORD—*Continued.*

JUNE 14TH TO DECEMBER 31ST, 1913—*Concluded.*

Place.	1913. Date.	1913. Hour.	Bar.	Thermometer. At Time	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Weather at Time.	Weather during Last Interval.
				Degs.	Degs.	Degs.					
Camp on timbered river flats at approximate elevation of 1,600 feet	Dec. 10	8 p.m.	28.03	28	..	..	...	..	..	Fair	Winds cease about 4 p.m.
	Dec. 11	8 a.m.	28.04	20	..	20	...	..	9	Fair	Fair.
	Dec. 11	2 p.m.	28.22	24	..	..	S.W.	1	6	Fair	Fair.
	Dec. 11	8 p.m.	28.30	16	..	..	W.	1	9	Fair	Fair.
	Dec. 12	8 a.m.	28.34	10	..	9	...	..	10	Cloudy	Cloudy.
	Dec. 12	2 p.m.	28.27	16	..	..	W.	1	4	Fair	Fair.
	Dec. 12	8 p.m.	28.50	4	..	..	...	..	..	Fair	Fair.
Temporary winter quarters, Sikanni Chief River	Dec. 13	8 a.m.	28.46	—10	..	—10	W.	1	2	Fair	Very fair.
	Dec. 13	2 p.m.	28.40	..	..	..	...	..	2	Fair	Fair.
	Dec. 13	8 p.m.	28.36	— 3	..	..	...	..	..	Fair	Fair.
	Dec. 14	8 a.m.	28.18	+ 4	..	—10	E.	1	1	Fair	Fair.
Camp on timbered river flats at elevation of 1,600 feet	Dec. 14	2 p.m.	28.10	+ 6	..	..	N.E.	1	..	Very fair	Very fair.
	Dec. 14	8 p.m.	28.02	+ 6	..	..	S.W.	4	10	Cloudy	Fair.
	Dec. 15	8 a.m.	28.02	+ 6	..	+ 4	W.	1	3	Fair	Cloudy.
	Dec. 15	2 p.m.	28.13	+12	..	..	...	..	2	Fair	Fair.
	Dec. 15	8 p.m.	28.25	+ 2	..	..	...	..	..	Fair	Transparent sky.
	Dec. 16	8 a.m.	28.24	+10	..	+ 4	S.W.	2	10	Cloudy	Sky clouds over during night.
	Dec. 16	2 p.m.	28.17	+15	..	..	...	..	10	Snow clouds, wind from north	Dull.
	Dec. 16	8 p.m.	28.13	+14	..	..	N.	3	8	Clearing, with light clouds	Cloudy.
	Dec. 17	8 a.m.	28.25	+13	..	+11	S.	1	10		Clouds over again at 10 p.m.
	Dec. 17	2 p.m.	28.45	+15	..	..	S.W.	4	..	Very fair	Sky clears at 10 a.m., with south-west breeze.
	Dec. 17	8 p.m.	28.63	+ 9	..	..	...	..	..	Fair	Fair.
	Dec. 18	8 a.m.	28.57	— 3	..	— 6	S.W.	1	..	Fair	Fair.
	Dec. 18	2 p.m.	...	..	..	..	S.W.	4	2	Fair	Fair.
	Dec. 18	8 p.m.	28.70	— 3	..	..	...	..	..	Very fair	Very fair.
	Dec. 19	8 a.m.	28.70	— 5	..	— 5	...	..	..	Fair	Fair.
On trail north to Fort Nelson	Dec. 19	2 p.m.	...	+12	..	..	...	..	8	Fair	Cloudy.
	Dec. 19	8 p.m.	27.77	+10	..	..	...	..	.	Fair	Fair.
	Dec. 20	8 a.m.	27.89	— 2	..	— 3	N.	2	10	Cloudy	Cloudy.
	Dec. 20	2 p.m.	...	..	..	..	N.	3	10	Cloudy	Slight snow.
	Dec. 20	8 p.m.	28.02	+ 3	..	..	N.	2	10	Fine snow	Cloudy.
	Dec. 21	8 a.m.	27.92	— 7	..	— 7	N.	2	10	Cloudy	Light snow during night.

	Dec. 21	2 p.m.	...	..	..	..	N.	2	10	Cloudy	Gloomy.
	Dec. 21	8 p.m.	27.81	—10	..	..	N.	2	10	Cloudy	Gloomy.
	Dec. 22	8 a.m.	27.83	—10	..	—10	N.	2	10	Cold north wind..	Fine particles of frosty snow.
	Dec. 22	2 p.m.	28.12	..	..	..	N.E.	4	10	Raw cold	Cloudy, cold north-east wind.
	Dec. 22	8 p.m.	28.59	—15	..	..	N.E.	2	2	Raw cold	Cloudy, cold north-east wind.
	Dec. 23	8 a.m.	28.51	—13	..	15	N.E.	2	10	Cloudy	Slight frosty snow.
	Dec. 23	2 p.m.	...	..	..	..	E.	3	2	Fair	Clearing.
Fort Nelson, 70 feet above river	Dec. 23	8 p.m.	29.12	— 4	..	..	E.	2	10	Cloudy	Cloudy, dull.
	Dec. 24	8 a.m.	29.07	..	..	+ 4	E.	2	10	Cloudy	Cloudy, dull.
	Dec. 24	2 p.m.	29.12	..	..	..	N.	1	10	Snowing	Commences snowing at 1 p.m.. fairly large-sized flakes.
	Dec. 24	8 p.m.	29.09	..	..	..	N.	2	10	Cloudy	Snows at intervals.
	Dec. 25	8 a.m.	29.11	— 4	..	— 4	N.	2	10	Cloudy	Cloudy.
	Dec. 25	2 p.m.	29.13	— 5	..	..	N.	1	10	Cloudy	Snows from 10 a.m. to 1 p.m.
	Dec. 25	8 p.m.	29.09	— 7	..	..	N.	1	10	Cloudy	Cloudy.
Fort Nelson, 70 feet above water in Nelson River	Dec. 26	8 a.m.	29.02	—10	..	—10	N.	1	9	Clearing	Cloudy.
	Dec. 26	2 p.m.	28.93	—12	..	..	S.	1	4	Fair	Fair.
	Dec. 26	8 p.m.	28.82	— 4	..	..	N.	1	10	Snowing	Commences snowing at 7 p.m.
	Dec. 27	8 a.m.	28.75	— 4	..	— 7	S.W.	1	10	Dull	Snows, 1 inch, during night.
	Dec. 27	2 p.m.	28.70	— 2	..	..	N.	1	10	Dull	Cloudy.
	Dec. 27	8 p.m.	28.86	— 6	..	..	N.	1	10	Cloudy	Cold north wind.
	Dec. 28	8 a.m.	28.95	—13	..	—15	...	..	2	Fair	Fair.
	Dec. 28	2 p.m.	28.98	— 6	..	..	...	..	1	Fair	Fair.
	Dec. 28	8 p.m.	29.00	—17	..	..	...	..	2	Fair	Fair.
	Dec. 29	8 a.m.	29.09	—20	..	—21	...	..	1	Fair	Clear night.
	Dec. 29	2 p.m.	29.05	—12	..	..	N.	2	..	Very fair	Fair.
	Dec. 29	8 p.m.	28.98	—18	..	..	...	..	..	Fair	Fair.
	Dec. 30	8 a.m.	28.85	—24	..	—25	N.	1	..	Misty	Fair.
	Dec. 30	2 p.m.	28.75	—14	..	..	...	..	10	Raw cold	Cloudy.
	Dec. 30	8 p.m.	28.73	—12	..	..	N.	2	10	Fine snow falling	Commences to snow at 7.30.
	Dec. 31	8 a.m.	28.74	—13	..	—14	S.W.	2	10	Dull	Snows very little during night.
	Dec. 31	2 p.m.	28.72	—12	..	..	W.	2	10	Cloudy	Cloudy.
	Dec. 31	8 p.m.	28.78	—22	..	..	N.	1	..	Cold clear night..	Clearing.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914.

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Fort Nelson	Jan. 1	8 a.m.	—14	—23	N.	1	..	...	Fair	Fair.
	Jan. 1	2 p.m.	— 9	...	...	..	..	...	Very fair	Sunshine.
	Jan. 1	8 p.m.	—22	...	...	..	..	...	Very fair	Very fair.
	Jan. 2	8 a.m.	—23	—29	...	..	..	...	Very fair	Very fair.
	Jan. 2	2 p.m.	—16	...	N.	2	3	K.S.	Fair	Fair.
	Jan. 2	8 p.m.	— 6	...	N.	3	10	S.	Snowing	Commenced to snow at 7 p.m.
	Jan. 3	8 a.m.	—12	—14	...	..	2	K.	Fair	Stops snowing at 11 p.m.
	Jan. 3	2 p.m.	— 1	...	S.W.	1	2	K.	Fair	Fair.
	Jan. 3	8 p.m.	—14	...	S.	1	..	...	Fair	Clear night.
	Jan. 4	8 a.m.	—18	—18	S.	1	..	...	Fair	Fair.
	Jan. 4	2 p.m.	— 8	...	S.	2	9	S.	Cloudy	Cloudy.
	Jan. 4	8 p.m.	— 2	...	...	..	10	S.	Cloudy	Cloudy.
	Jan. 5	8 a.m.	— 1	— 6	...	..	10	S.	Cloudy	Cloudy.
	Jan. 5	2 p.m.	3	...	N.	1	6	K.S.	Clearing	Cloudy.
	Jan. 5	8 p.m.	3	...	N.	1	8	K.S.	Cloudy	Cloudy.
	Jan. 6	8 a.m.	...	...	N.W.	5	10	S.	North-west wind..	Light snow.
	Jan. 6	2 p.m.	2	...	N.W.	4	10	S.	Fine particles of snow	Commenced to snow at noon.
	Jan. 6	8 p.m.	— 1	...	N.	1	10	S.		Snowing.
	Jan. 7	8 a.m.	— 6	— 6	...	..	..	...	Fair	Fair, 1 inch snow.
	Jan. 7	2 p.m.	...	...	N.	1	8	K.	Fair	Little snow.
	Jan. 7	8 p.m.	— 9	...	...	..	6	S.	Fair	Moonlight night.
	Jan. 8	8 a.m.	— 8	—16	...	..	8	K.	Dull	Cloudy.
	Jan. 8	2 p.m.	— 4	...	N.W.	2	4	K.	Fair	Fair.
	Jan. 8	8 p.m.	—16	...	S.	1	1	C.	Fair	Fair.
	Jan. 9	8 a.m.	—26	—26	...	..	4	S.	Fair	Fair.
	Jan. 9	2 p.m.	—12	...	N.	2	1	K.	Fair	Fair.
	Jan. 9	8 p.m.	— 8	...	N.	4	10	S.	North wind	Increasing north wind.
	Jan. 10	8 a.m.	—10	—14	N.	1	10	S.	Dull	Cloudy.
	Jan. 10	2 p.m.	— 8	...	N.	1	9	S.	Cloudy	Cloudy.
	Jan. 10	8 p.m.	—14	...	N.E.	3	10	S.	Cloudy	Cloudy.
	Jan. 11	8 a.m.	—18	—17	E.	1	10	S.	Cloudy	Cloudy.
	Jan. 11	2 p.m.	— 6	...	N.	1	10	S.	Cloudy	Cloudy.
	Jan. 11	8 p.m.	—10	...	N.	1	10	S.	Cloudy	Cloudy.

Jan. 12	8 a.m.	—14	—16	S.	1	..	K.	Clearing	Cloudy.
Jan. 12	2 p.m.	— 4	...	S.W.	1	8	K.S	Fair	Fair.
Jan. 12	8 p.m.	—10	...	...	..	4	C.K.	Fair	Fair.
Jan. 13	8 a.m.	—13	—14	S.	1	..	...	Fair	Fair.
Jan. 13	2 p.m.	...	...	...	..	2	...	Fair	Fair.
Jan. 13	8 p.m.	—10	...	...	..	..	...	Fair	Fair.
Jan. 14	8 a.m.	—11	—15	N.	1	..	...	Fair	Fair.
Jan. 14	2 p.m.	— 3	...	...	..	4	C.	Fair	Fair.
Jan. 14	8 p.m.	...	...	N.	2	8	K.	Fair	Fair.
Jan. 15	8 a.m.	—10	—12	...	..	..	...	Fair	Fair.
Jan. 15	2 p.m.	— 4	...	N.	1	2	C.	Fair	Fair.
Jan. 15	8 p.m.	—10	...	S.	1	8	K.	Clouding	Fair.
Jan. 16	8 a.m.	— 4	—18	N.	5	10	S.	Snow, blizzard ..	Commenced to snow at night.
Jan. 16	2 p.m.	— 1	...	N.	5	10	S.	Snowing	Blizzard from north.
Jan. 16	8 p.m.	— 4	...	N.	6	10	S.	Snowing	Blizzard from north.
Jan. 17	8 a.m.	—10	—14	N.	4	10	S.	Cloudy	Cloudy.
Jan. 17	2 p.m.	— 3	...	N.W.	4	10	S.	Light snow	Snows most of morning.
Jan. 17	8 p.m.	— 8	...	N.	1	10	S.	Cloudy	Cloudy.
Jan. 18	8 a.m.	— 4	— 5	...	..	10	S.	Cloudy	Light snow during night.
Jan. 18	2 p.m.	3	...	...	..	1	K.	Fair	Light snow, north wind.
Jan. 18	8 p.m.	— 8	...	...	..	..	...	Fair	Fair.
Jan. 19	8 a.m.	—18	—28	N.	1	2	K.	Fair	Fair.
Jan. 19	2 p.m.	— 8	...	N.	1	3	C.	Fair	Fair.
Jan. 19	8 p.m.	— 9	...	N.	1	10	S.	Cloudy	Clouding.
Jan. 20	8 a.m.	— 4	—10	N.	1	9	S.	Fair	Snows during night.
Jan. 20	2 p.m.	— 2	...	...	..	..	...	Fair	Very fair.
Jan. 20	8 p.m.	—20	...	S.E.	1	..	...	Fair	Very fair.
Jan. 21	8 a.m.	—27	—31	S.E.	1	..	...	Fair	Very fair.
Jan. 21	2 p.m.	— 5	...	N.	1	10	S.	Fine snow	Commenced to snow at noon.
Jan. 21	8 p.m.	— 3	...	...	..	10	S.	Fine snow	Snows most of afternoon.
Jan. 22	8 a.m.	— 5	— 7	...	..	..	...	Fair	Snows most of night.
Jan. 22	2 p.m.	— 3	...	S.	1	2	C.	Fair	
Jan. 22	8 p.m.	...	...	...	..	8	S.	Fair	Fine frosty snow.
Jan. 23	8 a.m.	—37	—38	...	..	..	...	Fair	Fair.
Jan. 23	2 p.m.	—20	...	...	..	..	...	Fair	Fair.
Jan. 23	8 p.m.	—34	...	...	..	..	...	Clear cold	Fair.
Jan. 24	8 a.m.	—45	—47	...	..	..	...	Clear cold	Fair.
Jan. 24	2 p.m.	—24	...	...	..	..	...	Clear cold	Fair.
Jan. 24	8 p.m.	—40	...	...	..	..	...	Clear cold	Fair.
Jan. 25	8 a.m.	—50	—51	...	..	..	...	Clear cold	Fair.
Jan. 25	2 p.m.	—30	...	N.W.	1	..	...	Clear cold	Fair.
Jan. 25	8 p.m.	—34	...	...	..	4	S.	Clouding	Fair.
Jan. 26	8 a.m.	—30	—40	...	..	10	S.	Raw cold	Snows slightly in night.
Jan. 26	2 p.m.	—15	...	N.	1	10	S.	Raw cold	Cloudy.
Jan. 26	8 p.m.	—18	...	N.	2	10	S.	Fine frosty snow	Frosty snow.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Fort Nelson	Jan. 27	8 a.m.	—23	—25	...	..	..	...	Fair	Fair.
	Jan. 27	2 p.m.	—16	...	N.	1	..	...	Fair	Fair.
	Jan. 27	8 p.m.	—34	...	S.	1	..	...	Fair	Fair.
	Jan. 28	8 a.m.	—49	—49	...	..	..	...	Fair	Fair.
	Jan. 28	2 p.m.	—26	...	...	..	..	...	Very fair	Very fair.
	Jan. 28	8 p.m.	—40	...	...	..	..	...	Very fair	Very fair.
	Jan. 29	8 a.m.	—34	—44	S.	1	10	K.S.	Dull	Clouds over in night.
	Jan. 29	2 p.m.	—18	...	S.	2	2	S.	Fair	Clearing.
	Jan. 29	8 p.m.	—18	...	...	..	10	S.	Cloudy	Cloudy.
	Jan. 30	8 a.m.	—12	—22	...	..	10	K.S.	Cloudy	Commences to snow at 7 p.m.
	Jan. 30	2 p.m.	3	...	...	..	10	K.S.	Cloudy	Fair.
	Jan. 30	8 p.m.	— 5	...	N.	1	10	S.	Slight snow	Fair.
	Jan. 31	8 a.m.	—14	—15	N.	5	10	K.S.	Cold north wind..	Fair.
	Jan. 31	2 p.m.	— 6	...	N.	5	10	K.S.	Cold north wind..	Fair.
	Jan. 31	8 p.m.	—12	...	N.	7	10	S.	Snowing	Raw cold.
	Feb. 1	8 a.m.	—20	—20	...	..	10	K.S.	Fair	Fair.
	Feb. 1	2 p.m.	—10	...	...	..	..	...	Very fair	Fair.
	Feb. 1	8 p.m.	—30	...	...	..	..	...	Very fair	Fair.
	Feb. 2	8 a.m.	—40	—40	N.	1	..	...	Very fair	Fair.
	Feb. 2	2 p.m.	—10	...	...	..	10	S.	Dull	Fair.
	Feb. 2	8 p.m.	—12	...	N.	2	10	S.	Light snow	Cloudy.
	Feb. 3	8 a.m.	—22	—22	N.E.	5	10	S.	Slight blizzard ..	North-east blizzard, slight.
	Feb. 3	2 p.m.	—20	...	N.E.	6	..	...	Cold north-east	North-east wind, fair.
	Feb. 3	8 p.m.	—36	...	...	..	..	...	Fair .....[wind	Wind drops at 5 p.m.
	Feb. 4	8 a.m.	—48	—48	...	..	..	...	Fair	Fair.
	Feb. 4	2 p.m.	—23	...	N.	1	..	...	Very fair	Clear cold.
	Feb. 4	8 p.m.	—39	...	...	..	..	...	Very fair	Clear cold.
	Feb. 5	8 a.m.	—49	—49	...	..	..	...	Very fair	Clear cold.
	Feb. 5	2 p.m.	—21	...	...	..	..	...	Very fair	Bright sun.
	Feb. 5	8 p.m.	—26	...	N.	3	10	K.S.	Fair	Fair, north-east wind, clouds.
	Feb. 6	8 a.m.	—39	—39	...	..	..	...	Fair	Fair.
	Feb. 6	2 p.m.	— 9	...	...	..	..	...	Bright sun	Very fair.
	Feb. 6	8 p.m.	—30	...	N.	1	..	...	Clear sky	Clear cold weather.

Feb. 7	8 a.m.	—46	—46	...	..	..	...	Mist on river ...	Transparent sky.
Feb. 7	2 p.m.	—20	...	...	..	..	...	Bright sun	Transparent sky.
Feb. 7	8 p.m.	—14	...	N.	2	10	S.	Cloudy	Clouds over at 3.30.
Feb. 8	8 a.m.	—11	—14	N.	1	10	S.	Snowing	Snow, 1 inch, in night.
Feb. 8	2 p.m.	...	...	N.	1	10	S.	Snowing	Light snow all morning.
Feb. 8	8 p.m.	— 5	...	N.	1	10	S.	Snowing	Light snow all afternoon.
Feb. 9	8 a.m.	— 5	— 8	...	..	10	S.	Snowing	Light snow all night.
Feb. 9	2 p.m.	4	...	S.	2	10	S.	Dull	Stops at noon.
Feb. 9	8 p.m.	— 5	...	N.	1	10	S.	Light snow	Snows most of afternoon.
Feb. 10	8 a.m.	— 8	— 5	...	..	10	S.K.	Cloudy	Snows, 1 inch, during night.
Feb. 10	2 p.m.	3	...	...	..	7	K.	Fair	Fair.
Feb. 10	8 p.m.	— 1	...	S.	2	10	S.	Cloudy	Fair.
Feb. 11	8 a.m.	— 5	— 3	...	..	10	S.	Cloudy	Light snow.
Feb. 11	2 p.m.	...	...	N.	3	10	S.	Fine snow	Fine snow.
Feb. 11	8 p.m.	— 6	...	N.	1	10	S.	Fine snow	Fine snow.
Feb. 12	8 a.m.	—15	—15	N.	5	10	S.	Fine snow	North wind, powder snow.
Feb. 12	2 p.m.	—13	...	N.W.	6	10	S.	Fine snow	North-west wind, powder snow.
Feb. 12	8 p.m.	—15	...	N.	1	9	S.	Fine snow	North wind, powder snow.
Feb. 13	8 a.m.	—15	—15	N.W.	1	10	S.	Fine frosty snow	North wind, powder snow.
Feb. 13	2 p.m.	— 7	...	N.W.	3	9	K.S.	Fair	Snows most of morning.
Feb. 13	8 p.m.	— 8	...	...	..	10	S.	Fair	Fair.
Feb. 14	8 a.m.	— 6	— 6	N.W.	2	10	S.	Fine snow	Snow, ½ inch, during night.
Feb. 14	2 p.m.	— 4	...	N.	2	10	S.	Cloudy	Snows most of morning.
Feb. 14	8 p.m.	— 2	...	S.	1	8	S.	Clearing	Fair.
Feb. 15	8 a.m.	...	— 9	N.	1	10	S.	Cloudy	Cloudy.
Feb. 15	2 p.m.	—14	...	...	..	10	S.	Cloudy	Cloudy.
Feb. 15	8 p.m.	6	...	...	..	..	...	Fair	Fair.
Feb. 16	8 a.m.	— 2	— 3	...	..	..	...	Low clouds	Clear night.
Feb. 16	2 p.m.	15	...	N.	3	..	...	Bright sun	Bright sunshine.
Feb. 16	8 p.m.	2	...	...	..	..	...	Clear	Fair.
Feb. 17	8 a.m.	7	— 7	...	..	10	S.	Cloudy	Sky clouds in night.
Feb. 17	2 p.m.	19	...	...	..	10	S.	Cloudy	Dull.
Feb. 17	8 p.m.	12	...	...	..	10	S.	Light snow	Commenced to snow at 5 p.m.
Feb. 18	8 a.m.	5	5	...	..	10	S.	Cloudy	Snowed, ¼ inch.
Feb. 18	2 p.m.	13	...	...	..	10	S.	Cloudy	Cloudy.
Feb. 18	8 p.m.	10	...	...	..	10	S.	Cloudy	Cloudy.
Feb. 19	8 a.m.	8	3	...	..	10	K.S.	Cloudy	Cloudy.
Feb. 19	2 p.m.	18	...	...	..	..	...	Bright sun	Sunshine.
Feb. 19	8 p.m.	...	...	N.	1	..	...	Clear sky	Fair.
Feb. 20	8 a.m.	5	— 4	N.	1	10	S.	Snowing	Commenced to snow during [night.
Feb. 20	2 p.m.	18	...	...	..	10	S.	Easterly wind ...	Cloudy.
Feb. 20	8 p.m.	7	...	E.	4	10	S.	Light snow	Snows a little.
Feb. 21	8 a.m.	1	— 1	...	..	10	S.	Light snow	Snows all morning.
Feb. 21	2 p.m.	13	...	W.	2	10	S.	Cold north wind..	Cloudy.
Feb. 21	8 p.m.	3	...	W.	3	10	S.	Cold north wind..	Cloudy.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Fort Nelson	Feb. 22	8 a.m.	—10	—10	N.	4	10	S.	Cold north wind..	Cloudy.
	Feb. 22	2 p.m.	...	...	...	..	10	S.	Cloudy	Dull, cloudy.
	Feb. 22	8 p.m.	— 6	...	...	..	6	K.S.	Clearing	Cloudy.
	Feb. 23	8 a.m.	...	— 7	...	..	4	K.S.	Fair	Fair.
	Feb. 23	2 p.m.	8	...	N.	1	9	C.	Fair	Fair.
	Feb. 23	8 p.m.	— 3	...	N.	4	6	S.	Cold north wind..	Sunshine.
	Feb. 24	8 a.m.	— 8	— 9	N.	6	10	S.	Cold north wind..	North wind.
	Feb. 24	2 p.m.	...	...	N.	2	6	K.S.	Fair	Fair.
	Feb. 24	8 p.m.	—11	...	...	..	..	...	Clear sky	Fair.
	Feb. 25	8 a.m.	— 8	—14	S.	1	8	C.K.	Fair	Fair.
	Feb. 25	2 p.m.	9	...	N.E.	3	4	K.	Sunshine	Fair.
	Feb. 25	8 p.m.	3	...	N.	1	10	S.	Cloudy	Clouding.
	Feb. 26	8 a.m.	— 3	— 4	N.E.	3	10	S.	Cloudy	Cloudy.
	Feb. 26	2 p.m.	4	...	N.	4	8	S.	Fair	Fair.
	Feb. 26	8 p.m.	...	...	N.	5	10	S.	Light snow	Cloudy.
	Feb. 27	8 a.m.	— 5	— 6	N.	4	10	S.	Snowing	Snowed, ½ inch.
	Feb. 27	2 p.m.	6	...	N.	1	1	C.	Bright sun	Stops snowing at 11 a.m.
	Feb. 27	8 p.m.	—10	...	...	..	..	...	Clear sky	Fair.
	Feb. 28	8 a.m.	—20	—21	...	..	..	...	Clear sky	Fair.
	Feb. 28	2 p.m.	20	...	N.	1	..	...	Bright sun	Very fair.
	Feb. 28	8 p.m.	...	...	...	..	..	...	Fair	Fair.
	March 1	8 a.m.	7	— 1	...	..	10	S.	Fair	Cloudy.
	March 1	2 p.m.	33	...	N.	1	6	S.	Fair	Fair.
	March 1	8 p.m.	18	...	...	..	10	S.	Cloudy	Fair.
	March 2	8 a.m.	5	— 1	...	..	6	C.	Fair	Fair.
	March 2	2 p.m.	33	...	N.	1	8	S.	Cloudy	Fair.
	March 2	8 p.m.	12	...	N.	6	10	S.	Strong north wind	North wind at 4 p.m.
	March 3	8 a.m.	2	1	N.	3	10	S.	Cloudy	North wind.
	March 3	2 p.m.	16	...	N.E.	3	2	C.	Sunshine	Fair.
	March 3	8 p.m.	...	...	N.W.	2	..	...	Clear	Light clouds.
	March 4	8 a.m.	—12	—15	...	..	..	...	Clear	Fair.
	March 4	2 p.m.	12	...	N.	4	..	...	Bright sun	Beautifully clear.
	March 4	8 p.m.	4	...	...	..	9	K.	Clouding, fair ...	Fair.

March 5	8 a.m.	— 5	— 9	...	..	..	...	Fair	Clear sky.
March 5	2 p.m.	24	...	N.	1	..	...	Sunshine	Bright sun.
March 5	8 p.m.	...	...	N.	1	..	...	Fair	Fair.
March 6	8 a.m.	...	— 9	...	..	1	C.	Fair	Fair.
March 6	2 p.m.	29	...	...	..	1	C.	Fair	Fair.
March 6	8 p.m.	10	...	S.	3	2	C.	Fair	Fair.
March 7	8 a.m.	4	— 6	...	..	1	C.	Fair	Fair.
March 7	2 p.m.	28	...	S.	2	..	...	Bright sun	Fair.
March 7	8 p.m.	8	...	...	..	..	...	Very fair	Fair.
March 8	8 a.m.	8	— 5	...	..	2	C.	Fair	Fair.
March 8	2 p.m.	38	...	...	..	..	...	Fair	Fair.
March 8	8 p.m.	12	...	...	..	..	...	Fair	Fair.
March 9	8 a.m.	10	...	S.	1	1	C.K.	Fair	Fair.
March 9	2 p.m.	46	...	S.	2	2	C.	Fair	Fair.
March 9	8 p.m.	20	...	...	..	10	S.	Cloudy	Fair.
March 10	8 a.m.	10	— 5	N.	1	1	C.	Fair	Fair.
March 10	2 p.m.	36	...	N.	1	8	C.	Fair	Fair.
March 10	8 p.m.	10	...	N.	6	1	C.	Strong north wind	Fair.
March 11	8 a.m.	— 5	— 6	N.	6	8	C.	Strong north wind	Cold, north gale.
March 11	2 p.m.	...	...	N.	8	10	S.	Blizzard, north ..	Commenced to snow at 10 a.m.
March 11	8 p.m.	—11	...	N.	6	10	S.	Light snow	Blizzard.
March 12	8 a.m.	—14	—16	...	..	4	C.	Fair	Storm ceases in night.
March 12	2 p.m.	7	...	N.	2	10	C.	Fair	Fair.
March 12	8 p.m.	— 4	...	S.	1	10	C.	Fair	Fair.
March 13	8 a.m.	...	— 8	...	..	10	S.	Cloudy	Fair.
March 13	2 p.m.	14	...	S.	1	..	...	Bright sun	Fair.
March 13	8 p.m.	— 5	...	...	..	..	...	Fair	Fair.
March 14	8 a.m.	—11	— 4	N.E.	1	4	C.	Fair	Fair.
March 14	2 p.m.	25	...	...	..	4	C.	Fair	Fair.
March 14	8 p.m.	4	...	N.	1	4	S.	Banked clouds ..	Fair.
March 15	8 a.m.	...	— 5	N.	4	3	C.	Windy	Clear.
March 15	2 p.m.	18	...	N.	4	1	C.	North wind	Fair.
March 15	8 p.m.	2	...	N.	6	..	...	Fair	North wind.
March 16	8 a.m.	— 5	— 9	N.	6	10	S.	North wind	North wind, with snow.
March 16	2 p.m.	5	...	S.	1	2	C.	Fair	Fair.
March 16	8 p.m.	—10	...	...	..	..	...	Fair	Fair.
March 17	8 a.m.	—15	—23	...	..	..	...	Very fair	Fair.
March 17	2 p.m.	28	...	...	..	..	...	Very fair	Fair.
March 17	8 p.m.	— 3	...	N.	1	..	...	Very fair	Fair.
March 18	8 a.m.	5	— 5	S.	4	9	C.	Very fair	Fair.
March 18	2 p.m.	17	...	...	..	3	C.	Very fair	Fair.
March 18	8 p.m.	32	...	...	..	10	S.	Cloudy	Fair.
March 19	8 a.m.	24	22	...	..	10	K.	Cloudy	Fair.
March 19	2 p.m.	29	...	N.	4	..	...	Fair	Fair.
March 19	8 p.m.	20	...	N.E.	6	..	...	Fair	Fair.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Fort Nelson	March 20	8 a.m.	18	2	N.E.	5	5	C.	North-east wind..	Fair.
	March 20	2 p.m.	39	...	...	..	1	C.	Very fair	Fair.
	March 20	8 p.m.	26	...	N.	1	10	S.	Cloudy	Fair.
	March 21	8 a.m.	27	18	N.E.	3	10	K.S.	Cloudy	Sky clears at intervals.
	March 21	2 p.m.	41	...	E.	3	10	S.	Cloudy	Cloudy.
	March 21	8 p.m.	32	...	...	..	9	S.	Dark clouds	Mild (snow wet).
	March 22	8 a.m.	32	22	N.	3	9	K.S.	Fair	Fair.
	March 22	2 p.m.	43	...	S.	1	9	S.	Dark clouds	Fair.
	March 22	8 p.m.	33	...	...	..	10	S.	Dark clouds	Cloudy.
	March 23	8 a.m.	13	13	N.E.	9	10	S.	North-east gale,	North-east blizzard.
	March 23	2 p.m.	18	...	N.E.	8	10	S.	Clearing ..[snow	North-east blizzard.
	March 23	8 p.m.	...	...	N.	4	..	...	Cold north wind..	Sky clearing.
	March 24	8 a.m.	—18	—26	N.E.	1	..	...	Fair	Fair.
	March 24	2 p.m.	4	...	N.E.	6	1	C.	Fair	Cold north-east wind.
	March 24	8 p.m.	—10	...	...	..	..	...	Fair	Cold north-east wind dies at
	March 25	8 a.m.	—19	—30	...	..	..	...	Fair	Clear and cold. [sunset.
	March 25	2 p.m.	16	...	S.	2	..	...	Bright sun	Fair.
	March 25	8 p.m.	...	...	...	..	..	...	Fair	Fair.
	March 26	8 a.m.	—20	—25	...	..	..	...	Fair	Fair.
	March 26	2 p.m.	23	...	N.E.	2	..	...	Fair	Fair.
	March 26	8 p.m.	2	...	...	..	..	...	Fair	Fair.
	March 27	8 a.m.	— 7	—19	...	..	..	...	Fair	Fair.
	March 27	2 p.m.	20	...	N.W.	4	1	C.	Fair	Fair.
	March 27	8 p.m.	— 5	...	...	..	..	...	Fair	Fair.
	March 28	8 a.m.	— 6	—23	...	..	..	...	Fair	Fair.
	March 28	2 p.m.	28	...	N.W.	1	..	...	Fair	Fair.
	March 28	8 p.m.	11	...	N.W.	3	..	...	Fair	Fair.
	March 29	8 a.m.	8	...	N.E.	2	10	S.	Cloudy	Clouds over in night.
	March 29	2 p.m.	20	...	N.	2	10	S.	Dull	Cloudy.
	March 29	8 p.m.	13	...	S.E.	3	10	S.	Fine snow	South-east wind, with snow.
	March 30	8 a.m.	13	7	E.	2	10	S.	Snowing	Snows most of night.
	March 30	2 p.m.	24	...	N.E.	4	10	S.	Snowing	Snows most of morning.
	March 30	8 p.m.	16	...	N.W.	4	10	S.	Snowing	Snows, with north-east wind.

	March 31	8 a.m.	10	10	N.W.	4	10	S.	Snowing	Light snow all night.
	March 31	2 p.m.	25	...	N.	3	6	S.	Clearing	Snows most of morning.
	March 31	8 p.m.	16	...	...	..	..	...	Fair	Fair.
	April 1	7 a.m.	12	...	...	..	10	C.	Fair	Fair.
	April 1	2 p.m.	28	...	S.	4	..	...	Fair	Fair.
	April 1	9 p.m.	16	...	S.	2	..	...	Fair	Fair.
	April 2	7 a.m.	12	— 6	...	..	..	...	Very fair	Fair.
	April 2	2 p.m.	38	...	S.	3	..	...	Very fair	Fair.
	April 2	9 p.m.	16	...	S.	1	..	...	Very fair	Fair.
	April 3	7 a.m.	15	— 4	...	..	..	...	Very fair	Fair.
	April 3	2 p.m.	44	...	E.	2	..	...	Very fair	Fair.
	April 3	9 p.m.	18	...	...	..	..	...	Clear cold	Fair.
	April 4	7 a.m.	20	3	...	..	..	...	Fair	Fair.
	April 4	2 p.m.	48	...	...	..	1	C.	Fair	Fair.
	April 4	9 p.m.	24	...	...	..	..	...	Fair	Fair.
	April 5	7 a.m.	14	6	...	..	..	...	Fair	Fair.
	April 5	2 p.m.	49	...	E.	5	6	C.K.	Fair	Fair.
	April 5	9 p.m.	18	...	S.E.	5	6	...	Fair	Fair.
	April 6	7 a.m.	30	8	...	..	10	S.	Cloudy	Cloudy.
	April 6	2 p.m.	50	...	...	..	10	K.S.	Mild	Dull.
	April 6	9 p.m.	36	...	...	..	10	K.S.	Cloudy	Snow thawing.
	April 7	7 a.m.	36	31	...	..	10	K.S.	Dull	Mild.
	April 7	2 p.m.	54	...	S.	1	8	K.	Fair	Dark clouds.
	April 7	9 p.m.	34	...	N.	1	10	S.	Cloudy	Snow thawing.
	April 8	7 a.m.	40	25	...	..	..	...	Fair	Clearing.
	April 8	2 p.m.	46	...	N.	8	10	C.	Strong north wind	South wind, thermometer to 54.
	April 8	9 p.m.	32	...	...	..	4	C.S.	Clearing	Strong north wind.
	April 9	7 a.m.	38	29	...	..	10	K.S.	Mild	Cloudy.
	April 9	2 p.m.	52	...	...	..	4	K.S.	Fair	Snow disappearing.
	April 9	9 p.m.	30	...	S.	1	..	...	Fair	Clear night.
	April 10	7 a.m.	26	25	S.	1	..	...	Fair	Clear night.
	April 10	2 p.m.	...	...	S.	2	..	...	Fair	Fair.
Fish Creek Camp	April 10	9 p.m.	32	...	...	..	..	...	Fair	Mild.
	April 11	7 a.m.	25	25	N.	3	10	S.	Cloudy	Cloudy, clears when wind is south.
	April 11	2 p.m.	...	...	S.	3	3	K.	Fair	
Camp north of Fish Lake	April 11	9 p.m.	34	...	N.	2	10	S.	Cloudy	Clouds in evening.
	April 12	7 a.m.	32	32	S.	2	10	S.	Light clouds	Slight snow in night.
	April 12	2 p.m.	...	...	S.W.	4	3	K.	Light clouds	Fair.
Fish Lake	April 12	9 p.m.	26	...	...	..	..	...	Fair	Fair.
	April 13	7 a.m.	26	15	N.	1	10	S.	Cloudy	Fair.
	April 13	2 p.m.	38	...	N.E.	3	10	N.	Snowing	Commenced to snow at 10 a.m.
	April 13	9 p.m.	25	...	...	..	3	S.	Banked clouds ..	Clearing.
	April 14	7 a.m.	30	16	...	..	..	...	Very fair	Fair.
	April 14	2 p.m.	52	...	S.W.	6	2	C.	Fair	Fair.
	April 14	9 p.m.	44	...	W.	6	10	S.	Dark clouds	Strong west wind.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Fish Lake	April 15	7 a.m.	42	40	W.	4	10	S.	Cloudy	Mild.
	April 15	2 p.m.	55	...	W.	6	4	S.K.	Strong west wind	Cloudy.
	April 15	9 p.m.	42	...	N.W.	2	1	S.	Low clouds	Strong west winds.
	April 16	7 a.m.	33	28	N.	1	10	K.S.	Dark clouds	Fair.
South end	April 16	2 p.m.	42	...	...	..	10	S.	Cloudy	Snows (wet snow).
	April 16	9 p.m.	28	...	...	..	6	C.	Clearing	Sleet at intervals.
	April 17	7 a.m.	28	21	...	..	..	...	Fair	Fair.
	April 17	2 p.m.	44	...	S.	2	2	K.	Fair	Fair.
	April 17	9 p.m.	33	...	...	..	..	...	Fair	Cloudy at intervals.
	April 18	8 a.m.	34	30	S.	1	8	C.	Fair	Fair.
	April 18	2 p.m.	...	...	S.	6	4	K.	Fair	Fair.
Camp	April 18	9 p.m.	42	...	...	..	10	K.S.	Fair	Strong south wind.
	April 19	8 a.m.	26	25	N.	4	10	S.	Cold north wind..	Cloudy.
	April 19	2 p.m.	28	...	N.	6	10	S.	Fine snow	Cold north blizzard.
	April 19	9 p.m.	20	...	...	..	..	...	Fair	Storm ceases at 6.
	April 20	8 a.m.	2	— 3	...	..	..	...	Fair	Fair.
	April 20	2 p.m.	...	...	S.	3	4	C.	Fair	Fair.
	April 20	9 p.m.	25	...	S.	1	..	...	Fair	Fair.
Trail north-west of Sikanni	April 21	8 a.m.	24	20	S.	1	..	...	Fair	Fair.
	April 21	2 p.m.	...	...	S.	3	1	K.	Fair	Fair.
	April 21	9 p.m.	28	...	S.	2	10	S.	Fair	Fair.
Plateau north-west of Sikanni	April 22	8 a.m.	33	22	N.W.	3	4	S.	Clearing	Cloudy.
	April 22	2 p.m.	55	...	N.	3	4	K.S.	Fair	Fair.
	April 22	9 p.m.	42	...	N.	3	10	S.	Cloudy	Fair.
	April 23	7 a.m.	34	24	...	..	4	C.	Fair	Cleared in night.
Sikanni River	April 23	2 p.m.	...	...	...	..	10	K.S.	Dull	Cloudy.
	April 23	9 p.m.	50	...	S.W.	4	10	S.	Cloudy	Dark clouds, slight showers.
	April 24	7 a.m.	40	30	S.W.	2	10	S.	Cloudy	Cloudy.
	April 24	2 p.m.	55	...	S.	2	3	S.K.	Fair	Clearing.
	April 24	9 p.m.	32	...	...	..	..	C.K.	Fair	Fair.
	April 25	7 a.m.	28	26	...	..	..	...	Fair	Fair.
	April 25	2 p.m.	46	...	S.	2	4	...	Clearing	Cloudy, showery.
	April 25	9 p.m.	42	...	S.	2	4	K.S.	Fair	Fair.

April 26	7 a.m.	36	24	...	..	8	S.	Dull	Fair.
April 26	2 p.m.	50	...	S.	2	4	K.	Clearing	Cloudy.
April 26	9 p.m.	40	...	...	..	..	...	Fair	Light clouds.
April 27	7 a.m.	32	28	...	..	..	...	Fair	Fair.
April 27	2 p.m.	62	...	N.	1	..	...	Fair	Fair.
April 27	9 p.m.	48	...	...	..	..	...	Fair	Fair.
April 28	7 a.m.	34	29	...	..	4	C.	Fair	Fair.
April 28	2 p.m.	46	...	W.	3	4	K.	Clearing	Strong west wind.
April 28	9 p.m.	36	...	...	..	..	...	Fair	Clearing.
April 29	7 a.m.	30	26	...	..	..	...	Fair	Fair.
April 29	2 p.m.	62	...	W.	6	10	S.	Cloudy, west wind	Cloudy.
April 29	9 p.m.	45	...	S.	2	10	S.	Overcast	Strong west wind.
April 30	7 a.m.	36	32	S.W.	2	..	...	Fair	Fair.
April 30	2 p.m.	62	...	W.	8	2	C.	Fair	Strong west winds 8 p.m. till sunset.
April 30	9 p.m.	48	...	...	..	8	C.	Fair.	
May 1	7 a.m.	43	32	S.	2	1	K.	Fair	Fair.
May 1	2 p.m.	60	...	S.W.	6	8	N.	Nimbus clouds ..	Fair.
May 1	9 p.m.	43	...	...	..	..	...	Fair	Cloudy at intervals.
May 2	7 a.m.	38	29	...	..	..	...	Fair	Light showers.
May 2	2 p.m.	56	...	N.W.	7	4	S.K.	Fair	Fair.
May 2	9 p.m.	39	...	N.W.	5	..	...	Fair	Fair.
May 3	7 a.m.	33	30	N.W.	4	9	N.S.	Clearing	Slight snowfall.
May 3	2 p.m.	60	...	N.W.	2	4	K.	Fair	Low clouds to south-east.
May 3	9 p.m.	41	...	...	..	..	...	Fair	Fair, west wind.
May 4	7 a.m.	28	26	...	..	..	...	Fair	Fair.
May 4	2 p.m.	60	...	N.	4	4	K.	Fair	Fair.
May 4	9 p.m.	42	...	...	..	..	...	Fair	Fair.
May 5	7 a.m.	30	28	...	..	..	...	Very fair	Fair.
May 5	2 p.m.	65	...	W.	3	9	...	Very fair	Fair.
May 5	9 p.m.	40	...	...	..	..	...	Very fair	Fair.
May 6	7 a.m.	34	28	...	..	..	...	Very fair	Fair.
May 6	2 p.m.	68	...	N.E.	4	..	...	Very fair	Fair.
May 6	9 p.m.	57	...	...	..	..	...	Very fair	Fair.
May 7	7 a.m.	32	29	...	..	2	C.	Very fair	Fair.
May 7	2 p.m.	70	...	S.	2	..	...	Warm sunshine..	Fair.
May 7	9 p.m.	52	...	...	..	..	...	Fair	Fair.
May 8	7 a.m.	34	31	S.	1	..	...	Fair	Fair.
May 8	2 p.m.	60	...	N.W.	4	4	K.	Fair	Fair.
May 8	9 p.m.	50	...	N.W.	1	4	C.	Fair	Fair.
May 9	7 a.m.	35	30	N.W.	1	7	K.	Fair	Fair.
May 9	2 p.m.	66	...	N.W.	2	4	C.K.	Fair	Fair.
May 9	9 p.m.	54	...	...	..	8	S.	Overcast	Fair.
May 10	7 a.m.	40	40	S.	1	4	C.	Fair	Clearing.
May 10	2 p.m.	68	...	N.W.	2	4	K.	Fair	Fair.
May 10	9 p.m.	56	...	...	..	2	S.	Low clouds	Fair.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Upper Sikanni River ...	May 11	7 a.m.	32	32	...	..	2	C.	Fair	Fair.
	May 11	2 p.m.	60	...	W.	4	2	K.	Fair	Fair.
	May 11	9 p.m.	44	...	...	..	8	K.	Fair	Fair.
	May 12	7 a.m.	40	32	N.E.	3	8	K.C.	Fair	Fair.
	May 12	2 p.m.	60	...	N.	4	4	C.	Fair	Fair.
	May 12	9 p.m.	49	...	S.W.	2	9	S.	Cloudy	Cloudy.
	May 13	7 a.m.	40	36	...	..	10	S.	Overcast	Cloudy.
	May 13	2 p.m.	60	...	N.E.	6	10	S.	Overcast	Cloudy.
	May 13	9 p.m.	50	...	...	..	8	S.	Clearing	Cloudy.
	May 14	7 a.m.	40	34	...	..	10	S.	Overcast	Cloudy.
	May 14	2 p.m.	60	...	S.	4	8	K.	Clearing	Light misty rain.
	May 14	9 p.m.	40	...	S.	2	3	K.	Fair	Fair.
	May 15	7 a.m.	34	20	...	..	..	...	Very fair	Fair.
	May 15	2 p.m.	52	...	...	..	..	...	Very fair	Fair.
	May 15	9 p.m.	45	...	S.	4	..	...	Fair	Southerly winds.
	May 16	7 a.m.	30	26	...	..	..	...	Fair	Fair.
	May 16	2 p.m.	50	...	N.	3	9	K.S.	Cloudy	Cloudy.
	May 16	9 p.m.	40	...	...	..	10	S.	Cloudy	Cloudy.
	May 17	7 a.m.	30	28	S.	2	..	...	Fair	Fair.
	May 17	2 p.m.	50	...	S.W.	4	9	K.S.	Fair	Fair.
	May 17	9 p.m.	44	...	S.W.	2	10	S.	Light rain	Showery at 6 p.m.
	May 18	6 a.m.	36	34	...	..	4	K.	Clearing	Cloudy.
	May 18	3 p.m.	61	...	N.	2	9	K.S.	Overcast	Clouds at intervals.
	May 18	9 p.m.	52	...	S.	2	10	S.	Overcast	Light showers.
	May 19	7 a.m.	43	36	S.	2	1	C.	Fair	Clearing.
	May 19	3 p.m.	65	...	S.W.	3	4	K.	Fair	Fair.
	May 19	9 p.m.	51	...	...	..	..	...	Fair	Fair.
	May 20	5 a.m.	32	31	N.	1	..	...	Very fair	Fair.
	May 20	3 p.m.	65	...	S.	..	7	K.	Fair	Fair.
	May 20	9 p.m.	58	...	N.	2	10	K.S.	Cloudy	Fair.
	May 21	6 a.m.	43	40	...	..	10	S.	Overcast	Cloudy.
	May 21	2 p.m.	72	...	N.W.	2	4	K.	Fair	Clouding.
	May 21	9 p.m.	60	...	N.W.	2	2	K.	Fair	Fair.

	May 22	6 a.m.	40	36	...	..	..	...	Fair	Fair.
Top of bench	May 22	2 p.m.	76	...	S.W.	3	4	C.	Fair	Fair.
Camp, latitude 57° 35′ ..	May 22	9 p.m.	54	...	W.	1	..	...	Fair	Fair.
	May 23	6 a.m.	36	24	...	..	..	...	Very fair	Cold frosty night.
	May 23	2 p.m.	74	...	S.W.	4	6	C.	Fair	Cold, frosty.
	May 23	9 p.m.	58	...	N.	2	10	C.S.	Dull	Cold, frosty.
Summit country	May 24	6 a.m.	40	34	E.	2	2	C.	Clearing	Clearing.
	May 24	2 p.m.	66	...	E.	3	8	C.S.	Fair	Fair.
	May 24	9 p.m.	46	...	...	..	10	S.	Dull	Cloudy.
Nelson Trail	May 25	6 a.m.	46	34	N.W.	2	9	C.S.	Clearing	Cloudy.
South side of summit ...	May 25	2 p.m.	60	...	N.E.	3	9	K.S.	Clearing	Cloudy.
	May 25	9 p.m.	47	...	N.	2	9	C.S.	Clearing	Cloudy.
South side of Summit	May 26	6 a.m.	32	20	E.	2	..	...	Very fair	Fair.
Camp	May 26	2 p.m.	60	...	S.W.	6	4	K.	Strong south-west	Dull, cloudy.
"Treaty Meadow"	May 26	9 p.m.	40	...	...	..	..	...	Fair .....[breeze	Fair.
	May 27	6 a.m.	32	19	...	..	4	C.K.	Clouding	Clear.
	May 27	2 p.m.	58	...	S.W.	6	10	S.N.	Cloudy	Fair.
Upper cache, North Pine	May 27	9 p.m.	33	...	...	..	..	...	Fair	Strong south-west winds.
	May 28	6 a.m.	34	21	...	..	..	...	Very fair	Fair.
	May 28	2 p.m.	61	...	W.	8	8	S.K.	Fair, west winds	Light clouds.
	May 28	9 p.m.	30	...	N.	1	4	C.	Clearing	Cloudy, west winds.
	May 29	6 a.m.	32	20	...	..	4	C.	Fair	Light north breeze.
Coal Creek, half a mile	May 29	2 p.m.	61	...	N.W.	2	4	K.	Showry	Cloudy.
below Trapper's Cabin	May 29	9 p.m.	34	...	...	..	..	...	Fair	Showery.
	May 30	4 a.m.	24	24	...	..	..	...	Fair	Clear frosty night.
	May 30	2 p.m.	72	...	S.W.	4	3	K.	Fair	Fair.
Summit country	May 30	9 p.m.	40	...	...	..	10	S.	Dull	Fair.
	May 31	6 a.m.	34	30	...	..	5	...	Fair	Clearing.
	May 31	2 p.m.	70	...	W.	2	3	K.	Fair	Fair.
	May 31	9 p.m.	45	...	...	..	..	...	Very fair	Fair.
Camp, Sikanni River,	June 1	7 a.m.	40	32	...	..	10	S.	Cloudy	Fair.
latitude 57° 38′	June 1	2 p.m.	70	...	W.	2	4	K.	Fair	Fair.
	June 1	9 p.m.	49	...	S.	..	4	C.	Fair	Fair, smoky.
Sikanni River	June 2	6 a.m.	36	32	...	..	..	...	Very fair.	Fair.
	June 2	2 p.m.	71	...	S.W.	2	..	...	Smoky forest fires	Fair.
End of trail, three miles	June 2	9 p.m.	60	...	N.W.	6	10	S.	Overcast	Cloudy, smoky.
down-stream	June 3	6 a.m.	44	41	N.W.	2	10	S.	Heavy rain	Commenced to rain at 5 a.m.
	June 3	1 p.m.	51	...	N.	3	10	N.S.	Overcast	Rain most of morning.
	June 3	9 p.m.	46	...	N.	1	10	S.	Raining	Overcast.
	June 4	6 a.m.	44	42	...	..	10	S.	Overcast	Light rain.
	June 4	2 p.m.	55	...	N.W.	3	4	K.	Fair	Clearing.
	June 4	9 p.m.	...	...	N.	2	10	S.	Cloudy	Cloudy, windy.
	June 5	6 a.m.	46	44	...	..	10	N.	Light rain	Light rain in night.
	June 5	2 p.m.	50	...	S.E.	3	4	K.	Fair	Showery.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
End of trail, three miles down stream	June 5	9 p.m.	40	...	S.E.	1	2	C.	Clearing	Thunder at 5, followed by light rain.
	June 6	6 a.m.	...	...	...	..	10	S.N.	Overcast	
	June 6	2 p.m.	...	...	N.W.	1	10	S.	Light rain	Drizzling rain.
	June 6	9 p.m.	...	...	...	..	10	S.	Rain	Drizzling rain.
Left Sikanni	June 7	6 a.m.	...	...	N.W.	6	10	S.	Cloudy	Light rain.
	June 7	2 p.m.	...	...	N.W.	6	10	S.	Overcast	Cloudy.
	June 7	9 p.m.	...	...	N.	2	10	S.	Overcast	Cloudy.
	June 8	5 a.m.	...	...	N.	1	10	K.S.	Cloudy	Cloudy.
	June 8	2 p.m.	...	...	N.	6	10	C.	Fair	Clearing.
	June 8	9 p.m.	...	...	...	..	10	C.S.	Cloudy	Dull.
	June 9	6 a.m.	...	...	...	..	10	C.S.	Cloudy	Cloudy.
	June 9	2 p.m.	...	...	...	..	4	K.	Fair	Clearing.
	June 9	9 p.m.	...	...	...	..	2	...	Fair	Fair.
	June 10	6 a.m.	...	...	...	..	4	C.K.	Fair	Fair.
	June 10	2 p.m.	...	...	N.	2	10	S.	Light rain	Commenced to rain at 10 a.m.
	June 10	9 p.m.	...	...	...	..	10	C.	Light clouds	Distant thunder.
	June 11	6 a.m.	...	...	...	..	..	...	Very fair	Clearing.
Kaantah River	June 11	3 p.m.	...	...	N.	3	3	K.	Fair	Fair.
	June 11	9 p.m.	...	...	...	..	..	...	Very fair	Fair.
	June 12	6 a.m.	...	...	...	..	2	C.	Very fair	Fair.
Plateau east of Kaantah	June 12	2 p.m.	...	...	S.E.	3	1	K.	Very fair	Fair.
	June 12	9 p.m.	...	...	...	..	..	...	Very fair	Fair.
	June 13	6 a.m.	...	...	...	..	..	...	Very fair	Fair.
	June 13	2 p.m.	...	...	S.E.	2	4	K.	Very fair	Fair.
Camp at cache	June 13	9 p.m.	...	...	...	..	..	...	Very fair	Fair, warm.
	June 14	6 a.m.	...	...	...	..	..	...	Very fair	Fair.
	June 14	2 p.m.	...	...	S.W.	8	10	N.	Dark clouds	Thunder, south-west wind.
	June 14	9 p.m.	...	...	...	..	4	C.S.	Fair	Clears at 3.
	June 15	6 a.m.	...	...	...	..	7	C.	Fair	Fair.
	June 15	2 p.m.	...	...	...	..	4	C.K.	Light clouds	Fair, warm.
	June 15	9 p.m.	...	...	S.W.	2	10	S.	Light rain	Thunder, south-west gale.
	June 16	6 a.m.	...	...	...	..	6	C.K.	Fair	Clearing.
Summit meadows	June 16	2 p.m.	...	...	S.W.	2	8	K.	Warm (close) ..	Fair.

Sikanni winter quarters..	June 16	9 p.m.	...	...	...	..	10	S.	Overcast	Thunder-showers.
	June 17	6 a.m.	...	...	...	..	10	S.	Raining	Rain during night.
	June 17	2 p.m.	...	...	S.W.	2	10	S.	Heavy rain	Rain all morning.
	June 17	9 p.m.	...	...	...	..	4	S.K.	Clearing	Stops rain at 3.
	June 18	6 a.m.	...	...	...	..	10	S.	Raining	Showery.
	June 18	2 p.m.	...	...	S.W.	2	9	K.S.	Heavy rain	Rain at intervals.
	June 18	9 p.m.	...	...	...	..	10	S.	Overcast	Heavy showers.
	June 19	6 a.m.	...	...	...	..	10	S.	Overcast	Light rain.
	June 19	2 p.m.	...	...	N.W.	3	10	S.	Overcast	Light showers.
	June 19	9 p.m.	...	...	N.W.	1	10	S.	Raining	Commenced to rain at 4 p.m.
	June 20	6 a.m.	...	...	N.W.	3	10	S.	Raining	Rain most of night.
Set rain-gauge	June 20	2 p.m.	...	...	N.W.	2	10	S.	Cloudy	Rain stops at 10 a.m.
	June 20	9 p.m.	...	...	...	..	10	S.	Light rain	Overcast.
Rain-gauge read 1.3 inches	June 21	6 a.m.	...	...	...	..	8	C.	Clearing	Showers.
	June 21	2 p.m.	...	...	N.W.	4	10	S.	Overcast	Light showers.
Rainfall, 0.047 inches ..	June 21	9 p.m.	...	...	...	..	6	S.	Fair	Clearing.
Sikanni	June 22	6 a.m.	...	...	...	..	8	C.	Fair	Fair.
	June 22	2 p.m.	...	...	N.W.	5	6	K.	Fair, north-east	Fair, north-east wind.
	June 22	9 p.m.	...	...	...	..	2	C.	Fair .....[wind	Part cloudy.
	June 23	6 a.m.	...	...	N.	1	8	C.	Light clouds	Fair.
	June 23	2 p.m.	...	...	N.	3	2	K.S.	Fair	Fair, light northerly breeze.
Camp, Nelson Trail	June 23	9 p.m.	...	...	...	..	9	K.S.	Threatening	Part cloudy.
	June 24	5 a.m.	...	...	...	..	10	K.	Cloudy	Part cloudy.
	June 24	2 p.m.	...	...	S.	3	2	K.	Detached clouds..	Fair.
	June 24	9 p.m.	...	...	...	..	..	...	Very fair	Detached clouds.
	June 25	6 a.m.	...	...	N.W.	4	3	K.	Fair	Clear night.
	June 25	2 p.m.	...	...	W.	1	4	K.	Fair	Fair.
	June 25	9 p.m.	...	...	W.	4	..	...	Fair	Fair.
	June 26	6 a.m.	...	...	S.	3	6	K.	Fair	Fair.
	June 26	2 p.m.	...	...	W.	4	2	K.	Fair	Fair.
	June 26	9 p.m.	...	...	N.W.	3	..	...	Fair	Fair.
Sikanni	June 27	6 a.m.	...	...	N.W.	1	..	...	Fair	Fair.
	June 27	2 p.m.	...	...	N.W.	2	2	K.	Fair	Fair.
	June 27	9 p.m.	60	...	...	..	..	...	Fair	Fair.
	June 28	6 a.m.	...	50	S.W.	1	..	...	Fair	Fair.
	June 28	2 p.m.	78	...	S.W.	2	1	K.	Fair	Fair.
	June 28	9 p.m.	80	...	...	..	9	K.	Clouding	Fair.
	June 29	6 a.m.	59	57	...	..	..	...	Fair	Light showers.
	June 29	2 p.m.	80	...	...	..	2	K.	Fair	Light showers.
	June 29	9 p.m.	84	...	S.	1	1	C.	Fair	Light showers.
	June 30	6 a.m.	62	58	...	..	..	...	Fair	Light showers.
	June 30	2 p.m.	80	...	S.W.	1	2	K.	Bush fire, hazy ..	Fair.
	June 30	9 p.m.	70	...	S.	2	4	C.	Bush fire, hazy ..	Fair.
	July 1	7 a.m.	60	55	S.	1	..	...	Fair	Fair.
	July 1	2 p.m.	70	...	S.W.	4	3	K.	Part cloudy	Fair.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Sikanni	July 1	9 p.m.	60	...	...	..	..	...	Fair	Fair.
	July 2	7 a.m.	52	45	...	..	9	C.	Fair	Fair.
	July 2	2 p.m.	70	...	S.W.	2	4	K.	Fair	Fair.
	July 2	9 p.m.	65	...	...	..	..	...	Fair	Fair.
Sikanni winter quarters	July 3	7 a.m.	60	52	...	..	4	C.	Part cloudy	Fair.
	July 3	2 p.m.	70	...	S.W.	3	6	K.	Part cloudy	Fair.
Eighteen miles down-river	July 3	9 p.m.	60	...	...	..	..	...	Fair	Wind-storm, south-west to west.
	July 4	6 a.m.	50	46	S.W.	2	4	K.	Part cloudy	Fair.
	July 4	2 p.m.	74	...	N.W.	4	8	K.S.	Part cloudy	Fair.
Camp, one mile and a half	July 4	9 p.m.	60	...	N.W.	6	10	N.	Raining	Heavy rain at 7 p.m.
	July 5	6 a.m.	51	50	N.	2	10	S.	Light rain	Heavy rain during night.
	July 5	2 p.m.	58	...	N.	3	9	S.	Light rain	Showery.
	July 5	9 p.m.	60	...	...	..	..	...	Fair	Clearing.
Camp, Indians'	July 6	6 a.m.	56	43	...	..	..	...	Misty on river	Fair.
Fontasque and Sikanni	July 6	2 p.m.	82	...	W.	2	4	K.	Fair	Fair.
	July 6	9 p.m.	60	...	...	..	..	...	Fair	Fair.
Big barometer out of gear	July 7	7 a.m.	56	45	...	..	..	...	Fair	Fair.
	July 7	2 p.m.	...	...	N.W.	4	5	K.	Part cloudy	Fair.
	July 7	9 p.m.	70	...	N.W.	4	10	S.	Overcast	Thunder.
Junction of rivers	July 8	6 a.m.	58	50	...	..	10	S.	Dull	Overcast.
Picked ripe saskatoons	July 8	2 p.m.	78	...	W.	3	3	K.	Fair	Clearing.
ten miles up-stream	July 8	9 p.m.	...	...	...	..	2	C.	Fair	Fair.
	July 9	6 a.m.	58	48	...	..	..	...	Fair	Fair.
	July 9	2 p.m.	80	...	...	..	8	C.	Fair, close	Fair.
Camp	July 9	9 p.m.	64	...	...	..	3	C.	Fair, close	Fair.
	July 10	6 a.m.	60	48	...	..	2	C.	Fair	Fair.
	July 10	2 p.m.	76	...	S.W.	2	3	K.	Fair	Fair.
Along Fontah River	July 10	9 p.m.	68	...	...	..	10	S.	Cloudy	Fair.
Camp	July 11	7 a.m.	64	63	W.	2	..	...	Very fair	Light rain.
	July 11	2 p.m.	80	...	W.	2	5	K.	Very fair	Fair.
Junction of Fontah and	July 11	9 p.m.	60	...	W.	2	4	K.	Part cloudy	Fair.
Kaantah Rivers	July 12	7 a.m.	60	48	...	..	..	...	Fair	Fair.
	July 12	2 p.m.	...	...	...	..	2	K.	Fair	Fair.

	July 12	9 p.m.	66	...	...	..	..	...	Fair	Fair.
Four miles above junction	July 13	6 a.m.	55	48	...	..	..	...	Very fair	Fair.
	July 13	2 p.m.	80	...	...	..	2	C.	Very fair	Fair.
	July 13	9 p.m.	60	...	...	..	3	C.	Very fair	Fair.
	July 14	7 a.m.	60	49	W.	2	2	C.	Fair, hazy	Fair.
	July 14	2 p.m.	76	...	W.	4	10	S.	Overcast	Fair.
	July 14	9 p.m.	60	...	W.	1	10	S.	Overcast	Fair.
Forks of trails	July 15	6 a.m.	58	54	W.	6	10	S.	Squally	Overcast.
	July 15	2 p.m.	70	...	N.	7	10	S.	Threatening	Overcast.
Camp A	July 15	9 p.m.	60	...	N.	4	8	C.K.	Fair	Clearing.
	July 16	6 a.m.	55	50	...	..	..	...	Fair	Fair.
East fork of Fontah	July 16	2 p.m.	74	...	S.W.	4	3	K.	Fair	Fair.
Camp A	July 16	9 p.m.	66	...	...	..	10	S.	Overcast	Fair.
	July 17	6 a.m.	58	54	N.W.	2	..	...	Fair	Fair.
	July 17	2 p.m.	70	...	N.	1	2	K.	Fair	Fair.
	July 17	9 p.m.	64	...	...	..	10	S.	Cloudy	Fair.
	July 18	7 a.m.	60	56	...	..	8	C.	Cloudy	Clears.
	July 18	2 p.m.	...	...	S.W.	1	4	K.	Fair	Fair.
Cache at forks, Fontah and Kaantah	July 18	9 p.m.	60	...	...	..	10	S.	Light rain	Cloudy.
	July 19	6 a.m.	56	52	S.E.	5	10	S.	Light rain	Rain most of night.
	July 19	2 p.m.	66	...	S.	6	10	S.	Heavy rain	Thunder and rain.
	July 19	9 p.m.	60	...	W.	6	10	S.	Overcast	Rain stops at 3.30.
	July 20	7 a.m.	60	44	W.	4	10	S.	Cloudy	Light rain.
	July 20	2 p.m.	65	...	S.	5	10	C.	Cloudy	Cloudy.
	July 20	9 p.m.	52	...	...	..	9	C.	Clearing	Cloudy.
	July 21	7 a.m.	60	44	...	..	9	S.	Clearing	Cloudy.
	July 21	2 p.m.	...	...	W.	2	10	S.	Cloudy	Fair.
	July 21	9 p.m.	60	...	W.	5	10	S.	Heavy rain	Thunder and rain.
Fontah River	July 22	6 a.m.	58	50	...	..	2	C.	Clearing	Rain most of night.
	July 22	2 p.m.	74	...	N.W.	4	6	K.	Part cloudy	Fair.
	July 22	9 p.m.	54	...	...	..	8	C.	Fair	Fair.
	July 23	6 a.m.	52	44	...	..	..	...	Very fair	Fair.
	July 23	2 p.m.	...	...	N.W.	4	6	C.	Fair	Fair.
	July 23	9 p.m.	62	...	...	..	3	C.	Fair	Fair.
	July 24	6 a.m.	48	42	...	..	3	C.	Fair	Fair.
	July 24	2 p.m.	76	...	W.	2	8	C.S.	Cloudy	Fair.
Junction on Fontah and Sikanni	July 24	9 p.m.	70	...	...	..	10	S.	Light rain	Light rain.
	July 25	6 a.m.	54	50	W.	2	4	C.	Cloudy	Rain in night.
	July 25	2 p.m.	65	...	N.W.	4	10	S.	Raining	Showery.
Down Nelson River	July 25	9 p.m.	58	...	N.W.	1	10	S.	Misty rain	Showery.
	July 26	6 a.m.	52	49	N.	2	10	S.	Overcast	Rain at intervals.
	July 26	2 p.m.	...	...	N.	8	10	S.	Heavy rain	Rain.
	July 26	9 p.m.	52	...	W.	6	10	S.	Heavy rain	Heavy rain, north wind.
	July 27	6 a.m.	44	42	N.	1	10	S.	Rain	Rain in night.
	July 27	2 p.m.	...	...	N.	4	10	S.	Light rain	Rain, north wind.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Down Nelson River	July 27	9 p.m.	54	...	...	..	6	C.	Clearing	Light rain.
	July 28	6 a.m.	42	40	...	..	4	C.	Fair	Fair.
	July 28	2 p.m.	...	...	S.	2	4	K.	Fair	Fair.
	July 28	9 p.m.	60	...	...	..	..	...	Fair	Fair.
	July 29	6 a.m.	44	42	...	..	..	...	Fair	Fair.
	July 29	2 p.m.	...	...	N.W.	2	4	K.	Fair	Fair.
Fort Nelson	July 29	9 p.m.	60	...	...	..	8	S.	Cloudy	Fair.
	July 30	7 a.m.	48	44	...	..	6	S.	Clearing	Fair.
	July 30	2 p.m.	...	...	...	..	2	C.K.	Fair	Fair.
	July 30	9 p.m.	80	...	...	..	4	C.	Fair	Fair.
	July 31	7 a.m.	50	42	...	..	..	...	Very fair	Fair.
	July 31	2 p.m.	78	...	...	..	4	C.K.	Very fair	Fair.
	July 31	9 p.m.	62	...	...	..	6	K.	Fair	Fair.
Five miles below mouth of Snake River	Aug. 1	6 a.m.	64	43	...	..	10	S.	Raining	Overcast.
	Aug. 1	2 p.m.	77	...	...	..	6	K.	Clearing	Rain at intervals.
	Aug. 1	9 p.m.	61	...	...	..	..	...	Fair	Fair.
	Aug. 2	6 a.m.	63	44	...	..	..	...	Fair	Fair.
	Aug. 2	2 p.m.	75	...	S.	8	3	K.	Fair	Fair.
	Aug. 2	9 p.m.	56	...	...	..	..	...	Fair	Fair.
	Aug. 3	6 a.m.	62	41	...	..	10	K.S.	Cloudy	Fair.
Fort Nelson River	Aug. 3	2 p.m.	76	...	...	..	9	K.S.	Part cloudy	Fair.
	Aug. 3	9 p.m.	57	...	...	..	10	S.	Light rain	Commenced to rain at 3 p.m.
	Aug. 4	6 a.m.	54	46	N.	6	10	S.	Light rain	Heavy rain.
	Aug. 4	2 p.m.	65	...	N.W.	8	4	S.	Clearing	Strong north-west winds.
Fort Nelson	Aug. 4	9 p.m.	55	...	...	..	2	C.	Fair	Part cloudy.
	Aug. 5	6 a.m.	60	48	...	..	6	C.	Fair	Part cloudy.
	Aug. 5	2 p.m.	76	...	N.	1	4	K.	Fair	Part cloudy.
	Aug. 5	9 p.m.	70	...	...	..	8	C.S.	Fair	Part cloudy.
	Aug. 6	6 a.m.	70	48	...	..	..	...	Fair	Part cloudy.
	Aug. 6	2 p.m.	76	...	N.	1	4	K.	Dull	Part cloudy.
	Aug. 6	9 p.m.	60	...	N.	1	10	S.	Heavy rain	Rain commenced at 8 p.m.
	Aug. 7	6 a.m.	58	48	...	..	10	S.	Overcast	Cloudy.
	Aug. 7	2 p.m.	...	...	N.	2	10	S.	Overcast	Cloudy.

	Aug. 7	9 p.m.	...	...	...	..	10	S.	Part cloudy	Cloudy.
	Aug. 8	6 a.m.	60	46	...	..	10	S.	Raining	Rain in night.
	Aug. 8	2 p.m.	70	...	...	..	3	C.	Fair	Fair.
	Aug. 8	9 p.m.	50	...	...	..	4	S.	Part cloudy	Dull.
	Aug. 9	6 a.m.	60	50	...	..	6	C.S.	Part cloudy	Light rain.
	Aug. 9	2 p.m.	74	...	...	..	..	...	Fair	Fair.
	Aug. 9	9 p.m.	60	...	...	..	8	S.	Part cloudy	Fair.
	Aug. 10	6 a.m.	65	50	...	..	4	C.K.	Fair	Rain at intervals.
	Aug. 10	2 p.m.	72	...	N.	1	..	N.	Overcast	Fair.
	Aug. 10	9 p.m.	72	...	N.	2	..	...	Heavy rain	Rain commenced at 8 p.m.
	Aug. 11	6 a.m.	60	50	...	..	..	N.	Part cloudy	Rain.
	Aug. 11	2 p.m.	73	...	...	..	..	...	Fair	Fair.
	Aug. 11	9 p.m.	50	...	...	..	..	...	Fair	Fair.
	Aug. 12	6 a.m.	60	41	S.	1	..	...	Fair	Fair.
	Aug. 12	2 p.m.	75	...	S.	2	..	...	Fair	Fair.
	Aug. 12	9 p.m.	65	...	...	..	10	K.S.	Overcast	Fair.
	Aug. 13	6 a.m.	62	50	N.	1	8	K.S.	Clearing	Cloudy.
	Aug. 13	2 p.m.	70	...	W.	2	5	C.K.	Fair	Fair.
	Aug. 13	9 p.m.	75	...	S.W.	3	1	C.	Fair	Fair.
	Aug. 14	6 a.m.	75	50	...	..	2	S.	Fair	Fair.
	Aug. 14	2 p.m.	...	...	W.	2	4	K.	Fair	Fair.
	Aug. 14	9 p.m.	65	...	...	..	8	K.S.	Light rain	Clearing.
	Aug. 15	6 a.m.	60	51	...	..	8	K.S.	Fair	Clearing.
	Aug. 15	2 p.m.	73	...	S.	5	..	...	Fair	Fair.
	Aug. 15	9 p.m.	...	...	S.	2	..	...	Fair	Fair.
	Aug. 16	6 a.m.	60	41	S.	1	9	S.	Fair	Fair.
	Aug. 16	2 p.m.	...	...	N.W.	1	1	C.	Fair	Fair.
	Aug. 16	9 p.m.	...	...	...	..	..	...	Fair	Part cloudy.
Snake River	Aug. 17	6 a.m.	58	50	...	..	4	C.	Fair	Fair.
Eleven miles east of Nelson	Aug. 17	2 p.m.	74	...	N.W.	..	..	...	Fair	Fair.
	Aug. 17	9 p.m.	...	...	...	4	8	K.S.	Fair	Fair.
	Aug. 18	6 a.m.	56	52	...	..	..	...	Very fair	Fair.
	Aug. 18	2 p.m.	...	...	N.W.	5	1	C.	Very fair	Fair.
Camp, 17 miles east of Nelson	Aug. 18	9 p.m.	60	...	...	..	..	...	Very fair	Fair.
	Aug. 19	6 a.m.	58	48	...	..	..	...	Very fair	Fair.
	Aug. 19	2 p.m.	72	...	W.	2	2	C.	Very fair	Fair.
Camp, 12 miles east of Nelson	Aug. 19	9 p.m.	60	...	...	1	..	...	Very fair	Fair.
	Aug. 20	6 a.m.	60	54	N.W.	4	10	C.S.	Cloudy	Fair.
	Aug. 20	2 p.m.	...	...	N.W.	4	10	S.	Dull	Fair.
	Aug. 20	9 p.m.	60	...	...	..	..	...	Fair	Thunder, heavy rain.
	Aug. 21	6 a.m.	56	50	...	..	10	S.	Drizzling rain ...	Commenced to rain at 5 a.m.
	Aug. 21	2 p.m.	...	...	...	..	10	...	Overcast	Rains till noon.
	Aug. 21	9 p.m.	...	...	N.W.	2	10	...	Rain	Commenced to rain at 3 p.m.
	Aug. 22	6 a.m.	54	50	N.W.	4	10	I.	Rain	Heavy rain.
	Aug. 22	2 p.m.	...	...	N.	2	10	...	Rain	Rain.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
	Aug. 22	9 p.m.	60	...	...	..	10	...	Drizzling rain ...	Rain.
Camp, crossing	Aug. 23	6 a.m.	...	51	...	..	10	C.S.	Clearing	Misty rain.
Ootaah Dezie	Aug. 23	2 p.m.	74	...	...	..	4	K.	Fair	Fair.
	Aug. 23	9 p.m.	60	...	...	..	..	...	Fair	Fair.
	Aug. 24	6 a.m.	54	46	E.	4	..	...	Fair	Fair.
	Aug. 24	2 p.m.	...	...	S.W.	4	3	K.	Fair	Fair.
	Aug. 24	9 p.m.	56	...	...	..	..	...	Fair	Fair.
Moose Camp	Aug. 25	6 a.m.	52	48	W.	2	8	K.	Fair	Fair.
	Aug. 25	2 p.m.	...	...	...	..	..	...	Fair	Fair.
	Aug. 25	9 p.m.	79	...	...	..	10	K.S.	Overcast	Fair.
	Aug. 26	6 a.m.	58	54	...	..	2	K.	Clearing	Light rain.
	Aug. 26	2 p.m.	...	...	...	..	3	K.	Fair	Fair.
	Aug. 26	9 p.m.	52	...	...	..	..	...	Fair	Fair.
	Aug. 27	6 a.m.	47	34	...	..	..	...	Fair	Fair.
	Aug. 27	2 p.m.	...	...	N.W.	4	6	K.S.	Fair	Fair.
	Aug. 27	9 p.m.	50	...	...	..	..	...	Fair	Fair.
	Aug. 28	6 a.m.	55	44	...	..	9	K.S.	Clearing	Light clouds.
	Aug. 28	2 p.m.	68	...	N.W.	6	..	...	Fair	Fair.
	Aug. 28	9 p.m.	51	...	...	..	6	K.S.	Part cloudy	Strong north-west wind.
	Aug. 29	6 a.m.	40	30	...	..	..	...	Fair	Fair.
	Aug. 29	2 p.m.	...	...	...	..	..	...		
	Aug. 29	9 p.m.	...	...	...	..	..	...		
Cyclo Dezie	Sept. 1	7 a.m.	40	36	...	..	..	...	Fair	Fair.
	Sept. 1	2 p.m.	74	...	W.	2	5	C.K.	Light clouds	Fair.
	Sept. 1	9 p.m.	45	...	N.W.	4	10	S.	Overcast	Fair.
	Sept. 2	7 a.m.	50	44	...	..	10	C.S.	Gloomy	Cloudy.
	Sept. 2	2 p.m.	...	...	S.W.	2	6	C.K.	Light clouds	Cloudy.
Seventeen miles down ...	Sept. 2	9 p.m.	45	...	S.	1	..	...	Fair	Clouding.
First frost	Sept. 3	7 a.m.	42	32	...	..	..	...	Fair	Fair.
	Sept. 3	2 p.m.	...	...	S.W.	4	6	C.K.	Fair	Fair.
	Sept. 3	9 p.m.	40	...	...	..	..	...	Fair	Fair.
	Sept. 4	7 a.m.	45	30	S.W.	2	8	K.S.	Cloudy	Fair.
	Sept. 4	2 p.m.	...	...	S.W.	4	10	S.	Overcast	Heavy rain.

Recuperation Camp	Sept. 4	9 p.m.	50	...	...	..	10	S.	Overcast	Light rain.
	Sept. 5	7 a.m.	37	32	...	..	..	...	Fair	Fair.
	Sept. 5	2 p.m.	...	...	S.W.	..	4	K.	Fair	Fair.
	Sept. 5	9 p.m.	46	...	S.	..	..	...	Fair	Fair.
	Sept. 6	7 a.m.	44	32	S.	6	..	...	Misty	Clear, moonlight.
	Sept. 6	2 p.m.	...	...	E.	2	4	K.	Fair	Cloudy.
	Sept. 6	9 p.m.	48	...	E.	3	..	...	Clear	Part cloudy.
	Sept. 7	7 a.m.	50	48	S.E.	3	10	R.	Dull	Fair.
	Sept. 7	2 p.m.	68	...	S.E.	6	9	K.S.	Dull	Cloudy.
	Sept. 7	9 p.m.	...	...	S.E.	1	10	K.S.	Dull	Cloudy.
	Sept. 8	7 a.m.	40	35	S.E.	4	..	...	Fair	Clouds over at 7.30.
	Sept. 8	2 p.m.	...	...	S.E.	6	6	S.K.	Part cloudy	Part cloudy.
	Sept. 8	9 p.m.	50	...	S.E.	4	10	S.K.	Cloudy	Cloudy.
	Sept. 9	7 a.m.	38	30	...	..	..	...	Clear cold	Fair.
	Sept. 9	2 p.m.	...	...	S.W.	4	..	...	Fair	Fair.
	Sept. 9	9 p.m.	40	...	...	..	..	...	Fair	Fair.
	Sept. 10	7 a.m.	40	36	S.W.	3	10	S.	Cloudy	Light rain.
	Sept. 10	2 p.m.	...	...	W.	6	8	S.K.	Showery	Westerly winds.
	Sept. 10	9 p.m.	40	...	...	..	..	...	Fair	Fair.
Camp, a quarter of a mile south of Kotcho Lake	Sept. 11	7 a.m.	38	32	...	..	10	S.	Light rain	Cloudy.
	Sept. 11	2 p.m.	...	...	W.	4	6	K.	West winds	Clearing.
	Sept. 11	9 p.m.	...	...	...	..	..	...	Fair	Fair.
Fort Nelson	Sept. 12	7 a.m.	37	33	...	..	..	...	Fair	Fair.
	Sept. 12	2 p.m.	...	...	S.	1	3	K.S.	Fair	Fair.
	Sept. 12	9 p.m.	40	...	S.	2	10	S.	Dark clouds	Fair.
	Sept. 13	7 a.m.	50	40	N.	2	8	K.S.	Cloudy	Cloudy.
	Sept. 13	2 p.m.	60	...	...	2	4	K.	Fair	Part cloudy.
	Sept. 13	8 p.m.	40	...	...	..	..	...	Cloudy	Cloudy.
	Sept. 14	7 a.m.	42	...	...	..	10	S.	Cloudy	Light rain.
	Sept. 14	2 p.m.	52	...	N.	6	..	K.S.	Cloudy	Cloudy.
	Sept. 14	8 p.m.	40	...	N.	8	10	K.S.	Cloudy	Heavy showers.
	Sept. 15	7 a.m.	40	33	N.	7	..	...	Fair	Fair.
	Sept. 15	2 p.m.	54	...	N.	6	..	...	Fair	Fair.
	Sept. 15	8 p.m.	34	...	...	..	..	...	Fair	Fair.
	Sept. 16	7 a.m.	44	30	...	..	4	K.S.	Part cloudy	Fair.
	Sept. 16	2 p.m.	...	...	W.	2	6	K.	Part cloudy	Fair.
Ootant Dezie	Sept. 16	8 p.m.	40	...	...	..	6	C.	Part cloudy	Fair.
	Sept. 17	7 a.m.	40	35	E.	1	..	...	Fair	Fair.
	Sept. 17	2 p.m.	...	...	E.	2	..	...	Fair	Fair.
Camp on summit	Sept. 17	8 p.m.	32	...	...	..	..	...	Fair	Fair.
	Sept. 18	7 a.m.	36	30	...	..	10	S.	Cloudy	Fair to cloudy.
	Sept. 18	2 p.m.	...	...	...	..	10	S.	Cloudy	Cloudy.
	Sept. 18	8 p.m.	41	...	N.W.	2	10	S.	Cloudy	Cloudy.
	Sept. 19	7 a.m.	40	36	N.W.	4	10	S.	Dull	Cloudy.
	Sept. 19	2 p.m.	50	...	N.W.	2	10	S.	Cloudy	Cloudy.

WEATHER RECORD—*Continued.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Continued.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Camp on summit	Sept. 19	8 p.m.	40	...	...	..	10	S.	Cloudy	Cloudy.
	Sept. 20	7 a.m.	33	26	N.	1	10	S.	Dull	Part clear, cold.
	Sept. 20	2 p.m.	52	...	N.E.	3	10	S.	Clearing	Cloudy.
	Sept. 20	8 p.m.	40	...	E.	4	..	...	Fair	Fair.
	Sept. 21	7 a.m.	36	30	...	..	6	K.S.	Fair	Fair.
	Sept. 21	2 p.m.	58	...	E.	2	..	...	Fair	Fair.
	Sept. 21	8 p.m.	...	...	...	..	5	K.S.	Fair	Fair.
	Sept. 22	7 a.m.	33	29	...	..	10	K.S.	Fair	Fair.
	Sept. 22	2 p.m.	...	...	...	..	..	...	Fair	Fair.
	Sept. 22	8 p.m.	...	...	...	..	6	K.S.	Part cloudy	Light rain.
	Sept. 23	7 a.m.	42	40	...	..	10	S.	Cloudy	Light rain.
	Sept. 23	2 p.m.	...	...	W.	1	2	K.	Fair	Fair.
	Sept. 23	8 p.m.	52	...	...	..	6	K.S.	Cloudy	Fair.
	Sept. 24	7 a.m.	44	42	...	..	6	K.S.	Clearing	Light showers.
	Sept. 24	2 p.m.	...	...	...	..	3	N.	Fair	Fair.
	Sept. 24	8 p.m.	42	...	...	..	6	...	Part cloudy	Fair.
Tathie's Camp	Sept. 25	7 a.m.	42	38	...	..	2	C.	Fair	Fair.
	Sept. 25	2 p.m.	...	...	...	..	..	...	Fair	Fair.
	Sept. 25	8 p.m.	48	...	...	..	10	S.	Cloudy	Fair.
	Sept. 26	7 a.m.	44	44	...	..	..	...	Fair	Fair.
	Sept. 26	2 p.m.	...	...	...	..	4	C.	Fair	Fair.
Camp in Hay River	Sept. 26	8 p.m.	46	...	...	..	..	...	Fair	Fair.
	Sept. 27	7 a.m.	36	32	...	..	..	...	Fair	Fair.
	Sept. 27	2 p.m.	...	...	...	..	2	C.	Fair	Fair.
	Sept. 27	8 p.m.	45	...	...	..	6	S.	Part cloudy	Fair.
	Sept. 28	7 a.m.	40	40	...	..	..	...	Fair	Light rain.
	Sept. 28	2 p.m.	...	...	W.	3	10	S.	Cloudy	Fair.
Camp, Ekwantea	Sept. 28	8 p.m.	48	...	...	..	..	S.	Part cloudy	Cloudy.
	Sept. 29	7 a.m.	42	38	...	..	8	S.	Light clouds	Fair.
	Sept. 29	2 p.m.	...	...	...	..	..	...		
	Sept. 29	8 p.m.	...	...	...	..	..	...		
Camp, Fontas River	Oct. 1	7 a.m.	28	25	...	..	..	...	Fair	Fair.
	Oct. 1	2 p.m.	...	...	N.	2	..	...	Fair	Fair.

Trail forks	Oct. 1	8 p.m.	38	...	...	..	8	K.S.	Part cloudy	Fair.
	Oct. 2	7 a.m.	38	32	N.E.	2	10	...	Misty	Cloudy.
	Oct. 2	2 p.m.	...	...	E.	2	8	K.S.	Cloudy	Cloudy.
	Oct. 2	8 p.m.	28	...	...	..	..	...	Clear, frosty	Clear sky.
	Oct. 3	7 a.m.	20	16	...	..	2	...	Clear, frosty	Fair.
	Oct. 3	2 p.m.	...	...	S.E.	4	..	...	Fair	Fair.
Camp, Fontas River	Oct. 3	8 p.m.	38	...	S.E.	1	..	...	Fair	Fair.
	Oct. 4	7 a.m.	30	30	...	..	..	...	Fair	Fair.
	Oct. 4	2 p.m.	...	...	S.	2	2	C.	Fair	Fair.
	Oct. 4	8 p.m.	38	...	S.	1	..	...	Fair	Fair.
	Oct. 5	7 a.m.	42	36	S.W.	3	9	C.	Fair	Fair.
	Oct. 5	2 p.m.	...	...	S.W.	3	9	C.	Part cloudy	Fair.
	Oct. 5	8 p.m.	45	...	...	..	..	...	Fair	Fair.
	Oct. 6	7 a.m.	33	33	...	..	..	...	Fair	Fair.
	Oct. 6	2 p.m.	...	...	S.	2	..	...	Fair	Fair.
	Oct. 6	8 p.m.	40	...	S.	2	..	...	Fair	Fair.
	Oct. 7	7 a.m.	41	40	S.	1	3	C.	Tinted clouds ...	Fair.
	Oct. 7	2 p.m.	...	...	S.W.	3	..	...	Fair	Fair.
	Oct. 7	8 p.m.	...	...	N.W.	1	..	...	Fair	Fair.
	Oct. 8	7 a.m.	48	30	N.W.	1	10	S.	Cloudy	Cloudy during night.
	Oct. 8	2 p.m.	...	...	N.E.	4	10	S.	Cloudy	Cloudy.
	Oct. 8	8 p.m.	45	...	E.	3	10	K.S.	Cloudy	Cloudy.
	Oct. 9	7 a.m.	44	44	E.	3	10	K.S.	Cloudy	Cloudy.
	Oct. 9	2 p.m.	...	...	E.	2	4	C.	Clearing	Cloudy.
	Oct. 9	8 p.m.	40	...	S.E.	2	..	...	Fair	Fair.
	Oct. 10	7 a.m.	27	25	...	..	..	...	Fair	Fair.
	Oct. 10	2 p.m.	...	...	S.	2	..	...	Fair	Fair.
Camp on horse-trail	Oct. 10	8 p.m.	36	...	S.	4	..	...	Squally	Fair.
	Oct. 11	7 a.m.	...	21	S.	1	..	...	Clear	Fair.
	Oct. 11	2 p.m.	...	...	S.	3	..	...	Fair	Fair.
	Oct. 11	8 p.m.	40	...	S.	1	..	...	Fair	Fair.
	Oct. 12	7 a.m.	27	26	S.	1	..	...	Fair	Fair.
	Oct. 12	2 p.m.	...	...	S.	..	..	...	Fair	Fair.
	Oct. 12	8 p.m.	44	...	S.	10	..	S.	Cloudy	Fair.
	Oct. 13	7 a.m.	46	44	S.	5	..	...	Fair	Clear.
	Oct. 13	2 p.m.	...	...	S.	6	10	S.	Squally	Fair.
	Oct. 13	8 p.m.	47	...	S.	6	..	...	Squally	Cloudy.
	Oct. 14	7 a.m.	46	45	S.	5	..	...	Fair	Light rain.
	Oct. 14	2 p.m.	...	...	S.	6	..	...	Fair	Fair.
	Oct. 14	8 p.m.	48	...	S.	6	8	...	Light clouds	Fair.
	Oct. 15	7 a.m.	36	...	...	..	10	S.	Dull	Rain at intervals.
	Oct. 15	2 p.m.	...	...	S.	2	6	C.S.	Clearing	Cloudy.
	Oct. 15	8 p.m.	34	...	...	..	..	...	Fair	Fair.
	Oct. 16	7 a.m.	40	32	...	..	10	S.	Cloudy	Cloudy.

WEATHER RECORD—*Concluded.*

JANUARY 1ST TO OCTOBER 24TH, 1914—*Concluded.*

Place.	Date.	Hour.	Thermometer. Max.	Thermometer. Min.	Direction of Wind.	Velocity of Wind.	Amount of Cloud.	Kind of Cloud.	Weather at Time.	Weather during Last Interval.
			Degrees.	Degrees.						
Arrived Indian Camp at	Oct. 16	2 p.m.	...	...	S.	1	10	C.S.	Clearing	Light rain.
1 p.m.	Oct. 16	8 p.m.	...	...	...	..	..	...	Fair	Fair.
North Pine	Oct. 17	7 a.m.	30	28	...	..	..	...	Cloudy	Fair.
	Oct. 17	2 p.m.	...	...	...	..	..	...	Clearing	Fair.
	Oct. 17	8 p.m.	...	...	...	..	..	...	Fair	Fair.
	Oct. 18	7 a.m.	26	25	...	..	..	...	Fair	Fair.
	Oct. 18	2 p.m.	...	...	...	..	..	...		
	Oct. 18	8 p.m.	...	...	...	..	..	...		
	Oct. 19	7 a.m.	...	28	...	..	..	...		
Fort St. John	Oct. 19	2 p.m.	...	...	...	..	..	...		
	Oct. 19	8 p.m.	...	...	...	..	..	...		
	Oct. 20	7 a.m.	...	24	...	..	..	...		
	Oct. 20	2 p.m.	...	...	...	..	..	...		
	Oct. 20	8 p.m.	...	...	...	..	..	...		
	Oct. 21	7 a.m.	...	28	...	..	..	...	Misty	Fair.
	Oct. 21	2 p.m.	50	...	...	..	..	...	Fair	Fair.
	Oct. 21	8 p.m.	...	...	...	..	..	...	Fair	Fair.
	Oct. 22	7 a.m.	...	27	...	..	..	...	Fair	Fair.
	Oct. 22	2 p.m.	50	...	...	..	..	...	Fair	Fair.
	Oct. 22	8 p.m.	...	...	...	..	..	...	Fair	Fair.
	Oct. 23	7 a.m.	...	31	...	..	..	...	Fair, misty	Part cloudy.
	Oct. 23	2 p.m.	...	...	...	..	..	...	.....	
	Oct. 23	8 p.m.	...	...	...	..	..	...	Fair	Fair.
	Oct. 24	7 a.m.	...	34	...	..	..	...	Cloudy	Cloudy.

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