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Various pagings.

In Sessional paper No. 7, Part I, Dominion Lands, pages 28 & 87 are incorrectly numbered pages 8 & 8.

In Sessional paper No. 7, Part II, Dominion Lands Surveys, pages 22 & 86 are incorrectly numbered pages 2 & 8.

In Sessional paper No. 7, Part IV, North-West Territories, page 29 is incorrectly numbered page 2.

In Sessional paper No. 7, Report of the Commissioner ... 1886, page 55 is incorrectly numbered page 5.

SESSIONAL PAPERS.

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FIRST SESSION OF THE SIXTH PARLIAMENT

OF THE

DOMINION OF CANADA

SESSION 1887.



VOLUME XX

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See also Numerical List, page 4.

ALPHABETICAL INDEX

TO THE

SESSIONAL PAPERS

OF THE

PARLIAMENT OF CANADA.

FIRST SESSION, SIXTH PARLIAMENT, 1887.

A		C	
Adulteration of Food.....	8c	Canadian Section, Colonial Exhibition, Report on.....	12*
Agriculture, Annual Report.....	12	Canals, Expenditure on.....	8c
Alberta and Athabasca Railway Co.....	74	Canal Statistics.....	8a
Archives, Canadian.....	12b	Canal Tolls.....	8b
Auditor General, Annual Report.....	3	Census in Manitoba.....	29
B		Chamblly Canal Superintendent.....	42
Banff Springs Reservation.....	82	Change of Names of Places.....	66a
Banks, Shareholders in.....	18	Chinese Immigration.....	57, 57a
Baptisms, Marriages and Burials.....	26	Chippewa Indians.....	20a
Board of Examiners, Civil Service, Report of.....	5a	Civil Service List.....	5b
Bonds and Securities.....	38	Civil Service Promotions and Appointments.....	5c, 5e
Bossière Bros. & Co.....	72	Civil Service, Report of Board of Examiners.....	5a
Bremner, Mr., Report of.....	39	Civil Service Superannuations.....	25
Bridge across Welland Canal.....	42a	Claim of Six Nation Indians.....	20b
British American Vessels, Seizure of.....	48, 48a	Claims in the Disputed Territory.....	19a
British Canadian Loan and Investment Co.....	27	Clerk of the Crown in Chancery, Returns from.....	53, 53a, 53b
British Columbia, Defences of.....	62	Collings, James, M.D.....	32
British Copyright Works.....	36	Colonial Conference.....	45, 45a
Brokovski, Edward.....	73	Commercial Relations with France.....	88
C		Commissioner, Dominion Police.....	28
Cadets, Royal Military College.....	84	Commissioner, North-West Mounted Police.....	7a
Canadian Archives.....	12b	Consolidated Fund.....	24
Canadian Pacific Railway.....	34 to 34d	Criminal Statistics.....	12a
Correspondence between Interior Department and C. P. R.....	34	D	
Agreements with James Leamy and Donald McGillivray.....	34a	Defences of British Columbia.....	62
Reports on Work—Selection or Reservation of Land—Point Douglas—Lands at Donald—Lands on Indian Reserve at False Creek—Payment of Moneys—New Westminster Branch—Sudbury and Stobie Mines Branch—Extension of Algoma Branch—Rates and Tolls—Particulars under Consolidated Railway Act.....	34b	Deposits in P. O. Savings Banks.....	37
Town Site of Regina.....	34c	Disputed Territory, Claims in the.....	19a
Lands sold in Manitoba.....	34d	Dominion Lands granted Railway Companies.....	74
		Dominion Police Commissioner.....	28
		Dynamite imported into Halifax.....	61
		E	
		Election Returns, 1887.....	53b
		Electoral District of Kamouraska.....	47
		Elgin County, Junior Judge for.....	56
		Esquimalt and Nanaimo Railway.....	83

E		J	
Estimates, 1887-88	2	Jackson, Lieut.-Col. W. H., Report of	9c
Examinations for Promotion.....	5d	Junior Judge, County of Elgin.....	56
Exchange Bank.....	33	Justice, Annual Report.....	4
Expenditure and Receipts.	24a, 24b	K	
Expenditure on Canals.....	8c	Kamouraska, Electoral District of.....	47
Expenses, Unforeseen.....	22	Kamouraska, Wharf at.....	68
Exports and Imports.....	31	Kingsport, Railway from.....	78
F		Kingston and Montreal Forwarding Co.....	85
Fabre, Hon. Mr., Report of.....	88	L	
Final Report of War Claims Commission ..	9b	Langlois, Polydore, Wharf of.....	68
Fisheries, Annual Report.....	16	Lands on Vancouver Island	83
Fisheries Protection Service.....	16a	Lands sold in Manitoba by C. P. R.....	34d
Fisheries Question. Correspondence relative	16b	Laurie, Major-General, Report of.....	9d
to.....	16c	Leamy, James, Agreement with.....	34a
Fishing Bounties	16c	Leeds and Grenville Licensees	89
Fishing Rights of Indians	20	Les Fonds Post Office.....	35
Food, Adulteration of.....	8c	Library of Parliament, Annual Report.....	17
Franchise Act.....	47a, 47b	Licenses to cut Timber.....	19
G		List of Shipping	15c
Gauging Molasses.....	39	Lobster Fishery.....	16d
Giasson, Napoléon, Dismissal of.....	64	M	
Governor General's Warrants.....	21, 21a, 21b	Main Ducks and Yorkshire Islands.....	71
Grain and Animal Products.....	52	Manitoba Census.....	29
Grain carried on Intercolonial Railway.....	54	Marine, Annual Report.....	15
Gray, John, Appointment of.....	23	Medicine Hat Railway and Coal Co.....	74
H		Metlakahla Indians	20d
Haldimand Election Recount	53	Militia, Annual Report.....	9
Halifax, Dynamite imported into.....	61	Militia List.....	9a
Harbor of Pinette.....	30c	Miscellaneous Unforeseen Expenses	22
Harbor of Refuge at Port Rowan.....	30b	Montmorency Voters' List.....	53c
Harbor of Refuge at Wellington.....	30a	Montreal Cotton Company.....	67
High Commissioner.....	65	Montreal Flood Commission.....	46
Howe, William and George, Amounts paid ..	70	Mortuary Statistics.....	12c
Hudson Bay Expedition.....	15b	Mounted Police, Report of Commissioner....	7a
I		Murray Canal.....	42b
Ice-boats owned by Government.....	49	Mc	
Imperial Institute	79, 79a	McDougall, Michael.....	16a
Indian Affairs, Administration of	81	McGillivray, Donald, Agreement with.....	34a
Indian Affairs, Annual Report.....	6	McKay, William, Amounts paid	70
Indian Reserve near Georgian Bay.....	20c	McLaren, Inspector, Report of.....	39
Indians, Fishing Rights of.....	20	N	
Inland Revenue, Annual Report	8	Names of Places changed.....	66a
Inspection of Weights, Measures and Gas... 8b		"Neptune," Steamer.....	41
Insurance Companies, Abstract of State- ments of.....	14a	"Northern Light," Steamer	40
Insurance, Reports of Superintendent, 1885 and 1886.....	14, 14b	North Shore Railway.....	55
Intercolonial Railway—		Nova Scotia Central Railway Co.....	69
Rolling Stock.....	75	O	
Pullman and Parlor Cars.....	75a	O'Donoghue, M. F.	77
Oil furnished.....	75b	Oxford to New Glasgow, Railway from	44
Capital Expenditure.....	75c	P	
Casualties to Trains	75d	Penitentiary, St. Vincent de Paul	4a to 4p
Revenue and Expenditure	75e	Permits to cut Timber.....	19
Wire and other Fencing.....	75f	Pinette Harbor	30c
Grain carried on	54	Port Hood Harbor	30
Interior, Annual Report.....	7	Port Moody, Wharf at.....	34a
Interior Department and C. P. R.....	34	Port Rowan, Harbor of Refuge at.....	30b

P		S	
Postmaster-General, Annual Report	10	St. Vincent de Paul Penitentiary— <i>Continued.</i>	
Post Office at Les Fonds.....	35	Addenda for Defence of Warden.....	4g
Post Office Savings Banks.....	37	Defence of Warden.....	4k
Preventive Officers.....	50	Letter of J. B. Désormeau	4i
Prince Edward County Voters' Lists.	47b	Reconciliation between Warden and As-	
Prince Edward Island, Subsidy to.....	60	sistants.....	4j
Prince Edward Island Subway	63	Letter of J. E. Durocher	4k
Promotion Examinations.....	5d	Escape of Herwood and Williams.....	4l
Public Accounts, Annual Report.....	2	Complaints by Chief Keeper McCarthy....	4m
Public Works, Annual Report	11	Charges by "L'Etendard".....	4n
Public Works Expenditure.....	11a	Evidence of Employees.....	4o
		Letter of J. H. Bellerose and others	4p
		Complaints against Adolphe Lefaiivre.....	4q
Q		Subsidies to Railway Companies.....	80
Qu'Appelle, Long Lake and Saskatchewan		Subsidy to Prince Edward Island.....	60
Railway Co.	74	Subway, Prince Edward Island.....	63
		Superannuations, Civil Service.....	25
R		Superintendent of Chambly Canal	42
Railway Commission.....	13b	Supplementary Estimates	2
Railway Companies, Subsidies to	80	Swisher, Joseph.....	76
Railway from Oxford to New Glasgow.....	44		
Railways and Canals, Annual Report.....	13	T	
Railway Statistics.....	13a	Taché, Madame V., Wharf of.....	68
Receipts and Expenditure.....	24, 24a	Taylor, Judge, Report of.....	56a
Recommendations for Scrip.....	59	Tea imported.....	51
Regina Town Site	34c	Thunder Bay District, Explorations in	66
Report of Executive Commissioner, Colonial		Timber, Licenses and Permits to cut.....	19
Exhibition	12*	Timber, Sale of	20c
Representatives at Colonial Conference.....	45	Tracadie Harbor.....	58
Returning Officers, Particulars concerning..	53a	Trade and Navigation, Annual Report	1
Revising Officers, Remuneration to	47c	Trade Relations with West Indies.....	43
Royal Military College Cadets	84	Travis, Hon. Jeremiah, Enquiry respecting	56a
		Town Sites in the North-West.....	34c
S			
Schooner "Ste. Anne"	86	U	
Scrip, Recommendations for.....	59	Unforeseen Expenses	22
Secretary of State, Annual Report.....	5		
Seed Grain Advances	52a	V	
Seizure of British American Vessels	48, 48a	Vancouver Island, Lands on.....	83
Seymour, M. M., M.D.	32	Voters' Lists, Prince Edward County.....	47a, 47b
Shareholders of Banks	18		
Shipping List.....	15c	W	
Six Nation Indians, Claim of.....	20b	Walters, John, Charges against.....	71
Steamboat Inspection.....	15a	War Claims Commission, Final Report of...	9b
Steamship Service between France and		Warrants, Governor General's.....	21, 21a, 21b
Canada	72	Weights, Measures and Gas, Inspection of...	8b
St. Vincent de Paul Penitentiary.....	4a to 4g	Welland Canal, Bridge across the	42a
Supplementary Report of Inspector of		Wellington, Harbor of Refuge at.....	30a
Penitentiaries.....	4a	West Indies, Trade Relations with	43
Report of Inspector Moylan	4b	Wharf at Port Moody.....	34a
Escape of Fortier	4c	Windsor and Annapolis Railway	87
Charges against Roumald Gadbois.....	4d	Wire Fencing.....	75f
Memorandum from J. G. Baillairgé.....	4e	Wood, A. F.....	42b
Escape of Dorion	4f		

See also Alphabetical Index, page 1. ~~231~~

LIST OF SESSIONAL PAPERS

Arranged in Numerical Order, with their Titles at full length ; the Dates when Ordered and when Presented to both Houses of Parliament ; the Name of the Member who moved for each Sessional Paper, and whether it is Ordered to be Printed or Not Printed.

ERRATUM FOR LIST OF 1886.

On page 6, Return No. 9a, read *Printed for Distribution only*, instead of *Not printed*.

CONTENTS OF VOLUME A.

Census, 1886, of Province of Manitoba.....*Printed for both Distribution and Sessional Papers.*

CONTENTS OF VOLUME No. 1.

1. Tables of the Trade and Navigation of the Dominion of Canada, for the fiscal year ended 30th June, 1886. Presented to the House of Commons, 15th April, 1887, by Hon. M. Bowell—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 2.

2. Public Accounts of Canada, for the fiscal year ended 30th June, 1886. Presented to the House of Commons, 15th April, 1887, by Sir Charles Tupper. Estimates for the fiscal year ending 30th June, 1888 ; presented 9th May, 1887. Supplementary Estimates of Canada for the fiscal year ending 30th June, 1887 ; presented 14th June, 1887. Supplementary Estimates of Canada for the fiscal year ending 30th June, 1888 ; presented 14th June, 1887. Additional Supplementary Estimates for the year expiring 30th June, 1888 ; presented 20th June, 1887—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 3.

3. Annual Report of the Auditor-General on Appropriation Accounts, for the year ended 30th June, 1886. Presented to the House of Commons, 18th April, 1887, by Sir Charles Tupper—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 4.

4. Report of the Minister of Justice as to Penitentiaries in Canada, for the year ended 30th June, 1886. Presented to the House of Commons, 19th April, 1887, by Sir John A. Macdonald—
Printed for both Distribution and Sessional Papers.
- 4a. Supplementary Report of the Inspector of Penitentiaries, for the year ended 30th June, 1886, Presented to the House of Commons, 3rd June, 1887, by Hon. J. S. D. Thompson—
Printed for Department of Justice only.
- 4b. Return to an Address of the Senate to His Excellency the Governor General, dated 21st May, 1886, praying His Excellency to be pleased to cause to be laid before this House, a copy of the report of Inspector Moylan, upon the complaints made in 1884 by Deputy Warden Ouimet, of St. Vincent de Paul Penitentiary, against J. E. Durocher, ex-Guard of that institution, with copies of the evidence taken at the time of the enquiry referred to, and of the judgment of the Honorable the Minister of Justice ; also copies of all other documents relating to such complaints. Presented to the Senate, 27th May, 1887.—*Hon. Mr. Bellerose..... See 4a.*
- 4c. Return to an Address of the Senate to His Excellency the Governor General, dated 12th May, 1886, for copies of the reports made by the Inspector of Penitentiaries upon the escape of one Fortier, a prisoner, from the penitentiary of St. Vincent de Paul, on or about the 1st October,

- 1884; and also copies of the evidence taken at the time of the enquiries referred to, and of all other documents forming part of the record thereof. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4d. Return to an Address of the Senate to His Excellency the Governor General, dated 14th May, 1886, for a copy of the report upon the enquiry made by Inspector Moylan into certain complaints or charges against Romuald Gadbois, one of the employees at St. Vincent de Paul Penitentiary, at the end of the year 1884, or the commencement of the year 1885, together with copies of the evidence taken, and of all other documents forming part of the record thereof. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4e. Return to an Address of the Senate to His Excellency the Governor General, dated 17th May, 1886, for a copy of a letter or memorandum addressed by J. G. Baillairgé, Esquire, one of the members of the commission appointed to make an investigation into the management of the St. Vincent de Paul Penitentiary, in 1884, to Godfroi Laviolette, Esquire, Warden of that penitentiary, requesting the latter to withdraw from his reply to the defence of Mr. Téléphore Ouimet all that might be considered an attack upon, or complaint against the inspector, the other member of the commission of enquiry; also a copy of Mr. Laviolette's answer to this demand; also a copy of the report upon the state of that institution, made by the warden of the aforesaid penitentiary to the inspector after the customary visit of the latter at the beginning of the present year 1886, probably in February last, if such report has been made; also a copy of the judgment or decision of the Honorable Minister of Justice following the report by Messieurs Moylan and Baillairgé upon the enquiry held by them in 1884 into the management of St. Vincent de Paul Penitentiary. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4f. Return to an Address of the Senate to His Excellency the Governor General, dated 20th May, 1886, for a copy of Inspector Moylan's report on the enquiry made by him into the escape of one Dorioz, one of the convicts then confined in St. Vincent de Paul Penitentiary, with copies of the evidence and of all other documents bearing upon that escape, including the decision of the Government upon the said report. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4g. Return to an Address of the Senate to His Excellency the Governor General, dated 20th May, 1886, for a copy of the *addenda* for the written defence of the Warden of St. Vincent de Paul Penitentiary, filed at the end of the inquiry of 1884; also a copy of the reply of the said warden to the answers of Deputy Warden Ouimet to the charges made against him by the warden. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4h. Return to an Address of the Senate to His Excellency the Governor General, dated 10th May, 1886, for a copy of the plea or defence, in writing, of Warden Laviolette, filed at the end of the enquiry, made in 1884, into the administration of the penitentiary of St. Vincent de Paul, by Messieurs Moylan and Baillairgé. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4i. Return to an Address of the Senate to His Excellency the Governor General, dated 30th April, 1886, for a copy of a letter to the warden of the penitentiary of St. Vincent de Paul, dated 31st July, 1885, signed by ex-Keeper J. B. Desormeau, of the said penitentiary, against his dismissal, and making most serious charges against certain officials, and asking for an indemnity. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4j. Return to an Address of the Senate to His Excellency the Governor General, dated 20th May, 1886, for a copy of the report made by the warden of St. Vincent de Paul Penitentiary upon the fact of a reconciliation having taken place between that officer and his two assistants—the deputy warden and the head keeper—as ordered by the Minister of Justice, and as also mentioned in the annual report of the inspector for 1884-85, page xxv, lines 21, 22, 23, 24. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4k. Return to an Address of the Senate to His Excellency the Governor General, dated 5th May, 1886, for the copy of a letter to the warden of the penitentiary of St. Vincent de Paul, dated 31st July, 1885, and signed by ex-Guard J. E. Durocher, protesting against his dismissal, and making serious charges against certain officials. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4l. Return to an Address of the Senate to His Excellency the Governor General, dated 14th May, 1886, for copies of all reports which may have been made by Inspector Moylan, or by any other persons appointed by the Government for that purpose, on and upon the occasion of the escapes,

in 1881, of certain persons named Herwood and Williams, then prisoners at St. Vincent de Paul Penitentiary, as well as copies of all evidence taken at the enquiries which preceded these reports; and also copies of all other documents forming part of the record thereof. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.

- 4m. Return to an Address of the Senate to His Excellency the Governor General, dated 21st May, 1886, for a copy of the report of Inspector Moylan upon the complaints made in 1884 by Chief Keeper McCarthy, of St. Vincent de Paul Penitentiary, against Hector Demers, then Guard in that institution, with copies of the evidence taken, and of the judgment rendered by the Honorable the Minister of Justice; and also copies of all other documents relating to such complaints. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4n. Return to an Address of the Senate to His Excellency the Governor General, dated 19th May, 1886, praying His Excellency to be pleased to cause to be laid before this House, a copy of a letter from the Department of Justice, Penitentiaries Branch, addressed, on or about the 18th of June, 1883, to the Warden of St. Vincent de Paul Penitentiary, requesting that officer to draw the attention of the deputy warden of that institution to certain charges brought against the latter by "L'Etendard" newspaper, which accused him of having unduly interfered in the elections for the county of Laval in 1883; also a copy of the reply of the said deputy warden; also a copy of a second letter of the Department of Justice, Penitentiaries Branch, to the said warden on the subject of a new charge brought against the latter officer by the same newspaper, which complained that Deputy Warden Ouimet made use of convicts to carry on his correspondence, and particularly to prepare the reply mentioned in the first place, and requiring the warden to demand an explanation from his deputy on this subject, with the reply of the deputy warden; also copies of all other memoranda, documents, letters, &c., which may form part of the record, whether they be dated before or after the documents herein above mentioned. Presented to the Senate, 27th May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4o. Return to an Address of the Senate to His Excellency the Governor General, dated 19th May, 1886, for copies of the evidence of Jean Baptiste Desormeau, Jos. E. Durocher and Hector Demers, formerly employees at St. Vincent de Paul Penitentiary; also copies of the evidence of Félix Lesage, Guard; Léandre Mazurel, Steward; Noël Beauparlant, Instructor of Shoemaking; Adolphe Lefebvre, Messenger; George B. Lamarche, Storekeeper, and Godfroi Laviolette, Warden, who were called upon to give evidence in 1884, at the time of the enquiry into the management of the aforesaid penitentiary, made by Messieurs Moylan and Baillairgé, the commissioners appointed for that purpose. Presented to the Senate, 31st May, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4p. Return to an Address of the Senate to His Excellency the Governor General, dated 27th May, 1887, praying that His Excellency will be graciously pleased to cause to be laid before this House a copy of a letter dated 10th September, 1886, and signed by Jos. H. Bellerose, in relation to the difficulties at the St. Vincent de Paul Penitentiary, together with a copy of a letter from C. A. Nutting, Esq., Advocate, dated 28th August, 1886, upon the same subject; and also a copy of the report of Mr. Sherwood, Superintendent of Government Police, charged by the Honorable the Minister of Justice with the verification of the facts contained in the last-mentioned letter. Presented to the Senate, 3rd June, 1887.—*Hon. Mr. Bellerose*..... See 4a.
- 4q. Return to an Address of the Senate to His Excellency the Governor General, praying that His Excellency will be graciously pleased to cause to be laid before this House, copies of all complaints which may have been made by the authorities of the St. Vincent de Paul Penitentiary, since the 24th April, 1886, against Adolphe Lefaire, formerly an employee of the penitentiary; as also of all reports which the inspector may have made since the same date against the said Lefaire, together with copies of the decisions which the Honorable the Minister of Justice may have given upon these reports and complaints. Presented to the Senate, 23rd June, 1887.—*Hon. Mr. Bellerose*..... See 4a.
5. Report of the Secretary of State of Canada, for the year ended 31st December, 1886. Presented to the House of Commons, 21st April, 1887, by Hon. J. A. Chapleau—
Printed for both Distribution and Sessional Papers.
- 5a. Report of the Board of Examiners for the Civil Service in Canada, for the year ended 31st December, 1886. Presented to the House of Commons, 21st April, 1887, by Hon. J. A. Chapleau.....*Printed for both Distribution and Sessional Papers.*

- 5b. The Civil Service List of Canada, on the 1st July, 1886, pursuant to the 59th section of the Civil Service Act. Presented to the House of Commons, 17th May, 1887, by Hon. J. A. Chapleau.....*Printed for both Distribution and Sessional Papers.*
- 5c. Return of the names and salaries of all persons appointed to or promoted in the Civil Service during the year ending 1886, in terms of section 58, sub-section 2, of "The Civil Service Act" (Revised Statutes 17). Presented to the House of Commons, 29th April, 1887, by Hon. J. A. Chapleau.....*Printed for Sessional Papers only.*
- 5d. Return to an Order of the House of Commons, dated 11th May, 1887, for statement showing names of all candidates at the promotion examinations held at Ottawa, beginning on 1st March, past; names of all who passed such examinations and copies of all examination papers submitted to such candidates; also statement showing whether any, and, if so, which of such candidates were examined at such examinations later than the said 1st of March, and what questions were submitted to such candidate or candidates. Presented to the House of Commons, 25th May, 1887.—*Mr. Casey*.....*Not printed.*
- 5e. Return to an Order of the House of Commons, dated 20th April, 1887, for a Return showing :
1. The number of vacancies in the Civil Service on the 1st day of January, 1887, caused by superannuation during the year 1886. 2. The number since filled, and whether filled by promotions or new appointments. 3. The date of the appointment, the names of the party promoted or appointed, and the salary paid. 4. The names of all new appointments to the Civil Service since the 1st day of January, 1886, up to the 1st April instant, the position to which they have been appointed and the salary paid; also the respective ages of the appointees; also the changes and new appointments in the Senate and House of Commons. Presented to the House of Commons, 30th May, 1887.—*Mr. McMullen*.....*Not printed.*

CONTENTS OF VOLUME No. 5.

6. Annual Report of the Department of Indian Affairs, for the year ended 31st December, 1886. Presented to the House of Commons, 15th April, 1887, by Sir John A. Macdonald—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 6.

7. Annual Report of the Department of the Interior, for the year ended 31st December, 1886. Presented to the House of Commons, 18th April, 1887, by Hon. Thos. White—
Printed for both Distribution and Sessional Papers.
- 7a. Report of the Commissioner of the North-West Mounted Police Force, 1886. Presented to the House of Commons, 6th June, 1887, by Sir John A. Macdonald—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 7.

8. Report, Returns and Statistics of the Inland Revenues of the Dominion of Canada, for the fiscal year ended 30th June, 1886. Presented to the House of Commons, 15th April, 1887, by Hon. J. Costigan.....*Printed for both Distribution and Sessional Papers.*
- 8a. Canal Statistics for season of navigation, 1885, being Supplement No. 1 to the Inland Revenue Report, for the year ended 30th June, 1886—
Printed for both Distribution and Sessional Papers.
- 8b. Thirteenth Report on Inspection of Weights, Measures and Gas, being Supplement No. 2 to the Report of the Department of Inland Revenue. Presented to the House of Commons, 20th April, 1887, by Hon. J. Costigan.....*Printed for both Distribution and Sessional Papers.*
- 8c. Report on Adulteration of Food, being Supplement No. 3 to the Report of the Department of Inland Revenue.....*Printed for both Distribution and Sessional Papers.*
- 8d. Statement showing the amount of tolls accrued on all the canals for eleven months ended 31st May, 1887. Presented to the House of Commons, 20th June, 1887, by Sir Charles Tupper—
Not printed.
- 8e. Statement showing comparatively the expenditure on canals for the eleven months ending 31st May, 1886, and to 31st May, 1887. Presented to the House of Commons, 20th June, 1887, by Sir Charles Tupper.....*Not printed.*

CONTENTS OF VOLUME No. 8.

- 9** Annual Report of the Department of Militia and Defence of the Dominion of Canada, for the year ended 31st December, 1886. Presented to the House of Commons, 15th April, 1887, by Sir Adolphe Caron.....*Printed for both Distribution and Sessional Papers.*
- 9a.** The Militia List of the Dominion of Canada. Corrected to 1st January, 1887. Presented to the House of Commons, 15th April, 1887, by Sir Adolphe Caron—
Printed for both Distribution and Sessional Papers.
- 9b.** Final Report of War Claims Commission on matters in connection with the suppression of the rebellion in the North-West Territories in 1885, being continuation of Appendix No. 4 to the Report of 18th May, 1886, of the Department of Militia and Defence. Presented to the House of Commons, 4th May, 1887, by Sir Adolphe Caron—
Printed for both Distribution and Sessional Papers.
- 9c.** Report of Lieutenant-Colonel W. H. Jackson, Deputy Adjutant-General, Principal Supply, Pay and Transport Officer to the North-West Forces, and Chairman of War Claims Commission, on matters in connection with the suppression of the rebellion in the North-West Territories in 1885. Presented to the House of Commons, 4th May, 1887, by Sir Adolphe Caron—
Printed for both Distribution and Sessional Papers.
- 9d.** Report of Major General Laurie, commanding base and lines of communication, upon matters in connection with the suppression of the rebellion in the North-West Territories in 1885. Presented to the House of Commons, 23rd June, 1887, by Sir Adolphe Caron—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 9.

- 10.** Annual Report of the Postmaster General, for the year ended 30th June, 1886. Presented to the House of Commons, 15th April, 1887, by Hon. A. W. McLelan—
Printed for both Distribution and Sessional Papers.
- 11.** Annual Report of the Minister of Public Works of Canada, for the fiscal year 1885-86, on the works under his control. Presented to the House of Commons, 18th April, 1887, by Sir Hector Langevin.....*Printed for both Distribution and Sessional Papers.*
- 11a.** Statement of Expenditure on Public Works of the Dominion of Canada, from 1st July, 1867, to 30th June, 1881; also Statement of Expenditure prior to and since Confederation—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 10.

- 12** Report of the Minister of Agriculture for the Dominion of Canada, for the calendar year 1886. Presented to the House of Commons, 20th April, 1887, by Hon. J. Carling—
Printed for both Distribution and Sessional Papers.
- 12*** Report of Sir Charles Tupper, G.C.M.G., C.B., Executive Commissioner, on the Canadian Section of the Colonial and Indian Exhibition at South Kensington, 1886. Presented to the House of Commons, 25th April, 1887, by Hon. J. Carling—
Printed for both Distribution and Sessional Papers.
- 12a.** Criminal Statistics for the year 1885, being an Appendix to the Report of the Minister of Agriculture, for the year 1885. Presented to the House of Commons, 25th April, 1887, by Hon. J. Carling*Printed for both Distribution and Sessional Papers.*

CONTENTS OF VOLUME No. 11.

- 12b.** Report on Canadian Archives, 1886.....*Printed for both Distribution and Sessional Papers.*

CONTENTS OF VOLUME No. 12.

- 12c.** Abstracts of the Returns of Mortuary Statistics for the year 1886—
Printed for both Distribution and Sessional Papers.

- 13.** Annual Report of the Minister of Railways and Canals, for the past fiscal year, from the 1st July, 1885, to the 30th June, 1886, on the works under his control. Presented to the House of Commons, 19th April, 1887, by Hon. J. H. Pope. *Printed for both Distribution and Sessional Papers.*
- 13a.** Reports and Railway Statistics of Canada, and capital, traffic and working expenditure of the railways of the Dominion, 1885-86. *Printed for both Distribution and Sessional Papers.*
- 13b.** Return to an Address of the House of Commons to His Excellency the Governor General, dated 25th April, 1887, for a Return showing names, occupations and callings of the gentlemen appointed on the Railway Commission, showing dates of their appointments; also copies of any instructions given to the Commission, and of all correspondence between the Government and any member of the Railway Commission touching the matters to be enquired into by the Commission, and of the proceedings and evidence had and taken before the Commission, with statement showing (with date) the places where the sittings of the Commission have been held. Presented to the House of Commons 22nd June, 1887.—*Mr. Mulock. Not printed.*

CONTENTS OF VOLUME No. 13.

- 14.** Report of the Superintendent of Insurance, for the year ended 31st December, 1885—
Printed for both Distribution and Sessional Papers.
- 14a.** Abstract of Statements of Insurance Companies in Canada, for year ending 31st December, 1886. Presented to the House of Commons, 25th April, 1887, by Sir Charles Tupper—
Printed for both Distribution and Sessional Papers.
- 14b.** Report of the Superintendent of Insurance, for the year ended 31st December, 1886—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 14.

- 15.** Nineteenth Annual Report of the Department of Marine, for the fiscal year ended 30th June, 1886. Presented to the House of Commons, 15th April, 1887, by Hon. G. E. Foster.
Printed for both Distribution and Sessional Papers.
- 15a.** Report of the Chairman of the Board of Steamboat Inspection, for calendar year ended 31st December, 1886. *Printed for both Distribution and Sessional Papers.*
- 15b.** Report of the Hudson Bay Expedition of 1886, under the command of Lieut. A. R. Gordon, R.N.
Printed for both Distribution and Sessional Papers.
- 15c.** List of Shipping issued by the Department of Marine and Fisheries; being a List of Vessels on the Registry Books of the Dominion of Canada, on the 31st day of December, 1886—
Printed for both Distribution and Sessional Papers.

CONTENTS OF VOLUME No. 15.

- 16.** Annual Report of the Department of Fisheries, Dominion of Canada, for the year 1886. Presented to the House of Commons, 2nd June, 1887, by Hon. G. E. Foster—
Printed for both Distribution and Sessional Papers.
- 16a.** Special Report of the Fisheries Protection Service of Canada, 1886. Presented to the House of Commons, 3rd June, 1887, by Hon. G. E. Foster—
Printed for both Distribution and Sessional Papers.
- 16b.** Correspondence relative to the Fisheries Question, 1885-87. Presented to the House of Commons, 3rd May, 1887, by Hon. G. E. Foster—
Printed for both Distribution and Sessional Papers.
- 16c.** Return to an Order of the House of Commons, dated 6th June, 1887, for a Return showing the names of all persons who applied for fishing bounties for the year 1885, for the district of Grand Narrows and Washabuck, in the county of Victoria, Nova Scotia, showing too the names of those applicants who, for that year, were refused; showing too if the claim for fishing bounty of Michael McDougall was refused, and if so, why; showing too if said McDougall was afterwards appointed fishery warden for the said district, and, if he was, showing who was his immediate predecessor, and if the latter resigned or was dismissed, and if dismissed all papers showing why. Presented to the House of Commons, 22nd June, 1887.—*Mr. Barron. Not printed.*

- 16d.** Return to an Order of the House of Commons, dated 6th May, 1887, for copies of correspondence in connection with the lobster fishery and close season in the Provinces of Nova Scotia and Prince Edward Island. Presented to the House of Commons, 16th June, 1887.—*Mr. Flynn.*
Not printed.
- 17.** Report of the Joint Librarians of Parliament on the state of the Library of Parliament. Presented to the House of Commons, 14th April, 1887, by Hon. Mr. Speaker—
Printed for Sessional Papers only.

CONTENTS OF VOLUME No. 16.

- 18.** Shareholders in the Chartered Banks of the Dominion of Canada, as on the 31st December, 1886. Presented to the House of Commons, 18th April, 1887, by Sir Charles Tupper.
Printed for both Distribution and Sessional Papers.
- 19.** Return to an Address of the House of Commons to His Excellency the Governor General, dated 8th March, 1886, for a Return showing : 1. The total number of Orders in Council or Departmental Orders, since 1870, recommending the granting of licenses or permits to cut timber in the Dominion of Canada, with the total area (actual or approximate) covered by such orders. 2. For each separate year, since 1870, the name and address of each applicant in whose favor such order was made ; the date of each order ; the area covered by each order ; the location of the land covered by each such order ; the ground rent and Crown dues, respectively, paid in each case, and the bonus, if any, in addition to the cost of surveys, in each case required ; also the whole area covered by such orders in each year. 3. The total number of licenses issued under the authority of the several Orders in Council ; the total area covered by each license, whether the area consisted of detached pieces of land or of compact blocks ; and the period of time in each case during which the license was operative ; and in the case of permits, the purpose for which the timber was required. Presented to the House of Commons, 18th April, 1887.—*Mr. Charlton.*.....*Not printed.*
- 19a.** Return to an Address of the House of Commons to His Excellency the Governor General, dated 6th June, 1887, for copies of all Orders in Council and of all correspondence between the Government of Canada and the Government of the Province of Ontario, and between the Government of Canada and any person or persons, respecting timber licenses and Crown titles to lands affected by claims of settlers, and by mining claims, within the so-called Disputed Territory. Presented to the House of Commons, 15th June, 1887.—*Mr. Dawson.*
Printed for both Distribution and Sessional Papers.
- 20.** Return to an Order of the House of Commons, dated 14th April, 1886, for copies of petitions or letters from the Indians on the North Shore of Lake Huron or Lake Nipissing, with reference to their rights of fishing in those waters ; and correspondence on the same subject between the Department of Indian Affairs and the local superintendents. Presented to the House of Commons, 18th April, 1887.—*Mr. O'Brien.*.....*Not printed.*
- 20a.** Return to an Order of the House of Commons, dated 11th May, 1887, for a Return showing the amount of arrears now due to the Chippewa Indians of Lakes Huron and Superior, on the surrender of lands made by them under the Robinson Treaty, and all correspondence between the Indian Department of the Dominion Government and the Provincial Government of Ontario, relative to the same, since the 3rd day of May last. Presented to the House of Commons, 1st June, 1887.—*Mr. O'Brien.*.....*Not printed.*
- 20b.** Return to an Order of the House of Commons, dated 2nd May, 1887, for copies of all title deeds, patents, correspondence, and all documents respecting the claim of the Six Nation Indians, as set forth in their petition presented to this House on the 18th April, 1887. Presented to the House of Commons, 16th June, 1887.—*Mr. Paterson (Brant).*
Printed for both Distribution and Sessional Papers.
- 20c.** Return to an Address of the House of Commons to His Excellency the Governor General, dated 6th June, 1887, for copies of all papers, letters, documents, maps, &c., in any way relating to the action of the Dominion Government in setting apart an Indian reserve, under the Robinson or other treaty, between White Fish and Wanabtasch Rivers, several miles inland from the north shore of Georgian Bay ; for copies of all correspondence had between the Governments of the

- Dominion of Canada and the Province of Ontario on the subject; and for copies of all correspondence and other documents and papers with the Government of Canada and any person or persons, regarding the sale of timber upon said reserve, if any such sale has been had. Presented to the House of Commons, 23rd June, 1887.—*Mr. Barron*..... *Not printed.*
- 20d. Return to an Address of the Senate to His Excellency the Governor General, dated 21st April, 1887, praying that His Excellency will cause to be laid before this House, copies of the reports of the Commander of Her Majesty's Ship "Cormorant," and of the Superintendent of Indian Affairs for British Columbia, relative to the agrarian troubles last winter at the Indian Reserve of Metlakatla, together with all correspondence during the years 1886 and 1887 between the Dominion and Provincial Governments on the same subjects. Presented to the Senate, 23rd June, 1887.—*Hon. Mr. Macdonald*..... *Not printed.*
21. Statement of Governor General's Warrants issued since last Session of Parliament, on account of the year 1885-86. Presented to the House of Commons, 19th April, 1887, by Sir Charles Tupper..... *Not printed.*
- 21a. Statement of Governor General's Warrants issued since last Session of Parliament, on account of the year 1886-87. Presented to the House of Commons, 19th April, 1887, by Sir Charles Tupper..... *Not printed.*
- 21b. Return to an Order of the House of Commons, dated 5th May, 1887, for Return showing amounts (in detail) expended under Warrants from the Governor General in each of the years from 1873 to 1886, both inclusive. Presented to the House of Commons, 1st June, 1887.—*Sir Richard Cartwright*..... *Printed for Sessional Papers only.*
22. Statement of Miscellaneous Unforeseen Expenses. Presented to the House of Commons, 19th April, 1887, by Sir Charles Tupper..... *Printed for Sessional Papers only.*
23. Return to an Address of the Senate to His Excellency the Governor General, dated 28th May, 1886, for a copy of the Minute of the Treasury Board and Orders in Council appointing the late John Gray, Deputy Collector of Inland Revenue at Prescott; and also a copy of the Order in Council or other Order cancelling said appointment, with their respective dates. Presented to the Senate, 18th April, 1887.—*Hon. Mr. O' Donohoe*..... *Not printed.*
24. Return to an Order of the House of Commons, dated 18th April, 1887, for a Return of the receipts and expenditure, in detail, chargeable to the Consolidated Fund, from the 1st day of July, 1885, to the 10th day of April, 1886, and from the 1st day of July, 1886, to the 10th day of April, 1887, with estimates of receipts and expenditure. Presented to the House of Commons, 21st April, 1887.—*Sir Richard Cartwright*..... *Not printed.*
- 24a. Return to an Order of the House of Commons, dated 25th April, 1887, for a Return showing receipts and expenditure from 1st July to 20th April, in the years 1886 and 1887 respectively, with estimates for each year. Presented to the House of Commons, 28th April, 1887.—*Sir Richard Cartwright*..... *Not printed.*
- 24b. Return to an Order of the House of Commons, dated 2nd May, 1887, for a Return of receipts and expenditures to date of 1st May in the years 1886 and 1887, respectively, together with estimates of each year. Also memorandum of interest to be paid on the 1st of May. Presented to the House of Commons, 5th May, 1887.—*Sir Richard Cartwright*..... *Not printed.*
25. Statement of all superannuations and retiring allowances in the Civil Service, giving the name and rank of each person superannuated, or retired; his salary, age, and length of service; his allowance, and cause of retirement, and whether the vacancy has been filled by promotion or new appointment, &c., for the year ended 31st December, 1886. Presented to the House of Commons, 21st April, 1887, by Sir Charles Tupper..... *Printed for Sessional Papers only.*
26. General statements and returns of baptisms, marriages and burials in the districts of Arthabaska, Chicoutimi, Iberville, Joliette, Montmagny and Saguenay, for the year 1886. Presented to the House of Commons, 25th April, 1887, by Hon. Mr. Speaker..... *Not printed.*
27. Statement of the affairs of the British Canadian Loan and Investment Company, on 31st December, 1886. Presented to the House of Commons, 25th April, 1887, by Hon. Mr. Speaker—*Not printed.*
28. Report of the Commissioner, Dominion Police, under Revised Statutes of Canada, chapter 184, section 5. Presented to the House of Commons, 25th April, 1887, by Hon. J. S. D. Thompson—*Not printed.*

29. Report on Manitoba Census, in accordance with the requirements of the Census Act. Presented to the House of Commons, 27th April, 1887, by Hon. J. Carling.....*Not printed.*
30. Return to an Order of the House of Commons, dated 19th April, 1886, for copies of all correspondence relative to the closing of the northern entrance into Port Hood Harbor, with copies of reports of the Chief Engineer of the Public Works Department in reference to the matter; also copy of plan, specification and tenders asked for by the late Minister of Public Works in 1878. Presented to the House of Commons, 27th April, 1887.—*Mr. Cameron (Inverness)...**Not printed.*
- 30*a*. Return to an Order of the House of Commons, dated 10th May, 1887, for a Return of correspondence, petitions, reports of the Chief Engineer and others, relative to construction of harbor of refuge at Wellington, Ontario. Presented to the House of Commons, 10th June, 1887.—*Mr. Platt*.....*Not printed.*
- 30*b*. Return to an Order of the House of Commons, dated 6th May, 1887, for a copy of the report of the Chief Engineer on the construction of a harbor of refuge at or near Port Rowan, Ontario; also a copy of a memorial signed by George Stewart, M.D., and others, upon the subject, and also copies of such correspondence between other parties at Port Rowan and the Government on the same subject as has not already been brought down. Presented to the House of Commons, 10th June, 1887.—*Mr. Charlton*.....*Not printed.*
- 30*c*. Return to an Order of the House of Commons, dated 27th April, 1887, for copies of all correspondence, Departmental orders, reports and other papers relating to the dredging of the harbor of Pinette, Prince Edward Island. Presented to the House of Commons, 18th June, 1887.—*Mr. Welsh*.....*Not printed.*
31. Return to an Order of the House of Commons, dated 18th April, 1887, for a Return in the form used in the statements usually published in the *Gazette*, of the exports and imports from the 1st day of July, 1886, to the 1st day of April, 1887, distinguishing the products of Canada and those of other countries. Presented to the House of Commons, 27th April, 1887.—*Sir Richard Cartwright*.....*Not printed.*
32. Return to an Order of the House of Commons, dated 11th May, 1887, for vouchers, papers and correspondence showing the appointment of James Collings, M.D., as medical attendant of the Indian children at the Industrial School for Indian children at Qu'Appelle, under the care of Rev. Father Hugonard, the length of such service as medical attendant, and the amount received for the same; also the date of appointment of M. M. Seymour, M.D., as medical attendant of the Indian children in said school, the length of time during which he has served as medical attendant for the children of said school, and the date and amount of payment received for such service. Presented to the House of Commons, 22nd June, 1887.—*Mr. Charlton*.....*Not printed.*
33. Return to an Order of the House of Commons, dated 25th April, 1887, for a Return showing amount owing by the Exchange Bank to the Government of Canada at the time of the bank's failure, and statement showing all sums (with dates of payment) paid on account of such indebtedness. Presented to the House of Commons, 28th April, 1887.—*Mr. Mulock*.....*Not printed.*
34. Return *(in part)* under Resolution of the House of Commons, passed on the 20th February, 1887, on all subjects affecting the Canadian Pacific Railway, respecting details as to: 1. The selection of the route. 2. The progress of the work. 3. The selection or reservation of land. 4. The payment of moneys. 5. The laying out of branches. 6. The progress thereon. 7. The rates of tolls for passengers and freight. 8. The particulars required by the Consolidated Railway Act and amendments thereto, up to the end of the previous fiscal year. 9. Like particulars up to the latest practicable date before the presentation of the Return. 10. Copies of all Orders in Council and of all correspondence between the Government and the railway company, or any member or officer of either, relating to the affairs of the company. Presented to the House of Commons, 28th April, 1887, by Hon. Thos. White.....*Printed for Sessional Papers only.*
- 34*a*. Articles of agreement entered into between James Leamy and Donald McGillivray and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, Canada, for the removal and rebuilding of certain portions of the wharf at Port Moody, British Columbia, Canadian Pacific Railway, 107th Contract. Presented to the House of Commons, 11th May, 1887, by Hon. J. H. Pope.....*Not printed.*

- 34b.** Return (*in part*) under Resolution of the House of Commons, passed on the 20th February, 1882, on all subjects affecting the Canadian Pacific Railway, respecting details as to: 1. The selection of the route. 2. The progress of the work. 3. The selection or reservation of land. 4. The payment of moneys. 5. The laying out of branches. 6. The progress thereon. 7. The rates of tolls for passengers and freight. 8. The particulars required by the Consolidated Railway Act and amendments thereto, up to the end of the previous fiscal year. 9. Like particulars up to the latest practicable date before the presentation of the Return. 10. Copies of all Orders in Council and of all correspondence between the Government and the railway company, or any member or officer of either, relating to the affairs of the company. Presented to the House of Commons, 13th May, 1887, by Hon. J. H. Pope—

Printed for Sessional Papers only.

- 34c.** Return to an Order of the House of Commons, dated 6th June, 1887, for a Return showing the nature of the agreement made between the Government and the Canadian Pacific Railway Company, and other parties (if any), respecting the town site of Regina and other town sites in which the Government is part owner, the cost to the Government of collecting their share of the payments made on lots sold in such town sites up to the 30th June, 1886; also the amount realized up to that date by the Government on the sale of such lots, and the number of lots in town sites, together with the quantity of farm lands in the North-West Territories, to which the Canadian Pacific Railway Company is entitled, but for which up to the present they have not received patents from the Government. Presented to the House of Commons, 17th June, 1887.—*Mr. Davin*.....

Printed for Sessional Papers only.

- 34d.** Return to an Order of the House of Commons, dated 2nd May, 1887, for a Return of all lands sold in the Province of Manitoba by the Canadian Pacific Railway Company up to the 1st of April, 1887, together with the date of sale and the name of purchaser. Presented to the House of Commons, 22nd June, 1887.—*Mr. Watson*.....

Not printed.

- 35.** Return to an Order of the House of Commons, dated 19th April, 1886, for copies of all petitions correspondence or other documents relating to the establishment of a post office at a certain place called "Les Fonds," in the parish of St. Antoine, county Lotbinière. Presented to the House of Commons, 29th April, 1887.—*Mr. Rinfret*.....

Not printed.

- 36.** Return to an Order of the House of Commons, dated 20th April, 1887, for a statement showing all sums collected since 1st October, 1863, under the provisions of Statutes and Orders in Council in that behalf, as duty on foreign reprints of British copyright works, giving the amounts so collected upon each copyright work, and showing amount remitted in each year to the Imperial Government for payment out to those beneficially interested in the copyright of such works. Presented to the House of Commons, 29th April, 1887.—*Mr. Edgar*.....

Not printed.

CONTENTS OF VOLUME No. 17.

- 37.** Return to an Order of the House of Commons, dated 29th March, 1886, for a statement of sums deposited in the Post Office Savings Bank and Government Savings Banks on the 1st January, 1886, showing: Number of depositors holding amounts over \$1,000; number of depositors holding amounts over \$500 and under \$1,000; number of depositors holding amounts over \$300 and under \$500; number of depositors holding amounts below \$300, with total amount held by each class respectively. Presented to the House of Commons, 29th April, 1887.—*Mr. Charlton*—

Printed for Sessional Papers only.

- 38.** A detailed statement of all bonds and securities registered in the Department of the Secretary of State of Canada, submitted to the Parliament of Canada under "the Revised Statutes of Canada" (chapter 19, Section 23). Presented to the House of Commons, 29th April, 1887, by Hon. J. A. Chapleau.....

Not printed.

- 39.** Return to an Address of the House of Commons to His Excellency the Governor General, dated 20th March, 1887, for a Return of the reports of Inspector McLaren and Mr. Bremner of the Customs Department to the Minister of Customs, as to the mode of gauging molasses at the port of St. Stephen, N.B., and also any reports as to the mode used at the port of St. John, N.B., and any Orders in Council issued upon these reports or instructions of the Department of Customs. Presented to the House of Commons, 4th May, 1887.—*Mr. Weldon (St. John)*.....

Not printed.

40. Return to an Order of the House of Commons, dated 27th April, 1887, for a Return showing the date at which the steamer "Northern Light" commenced running between Prince Edward Island and Pictou, in the fall of 1886, how many trips were made by the said steamer, the date of each trip up to 15th April instant, with number of passengers. Presented to the House of Commons, 5th May, 1887.—*Mr. Perry*..... *Not printed.*
41. Return to an Order of the House of Commons, dated 27th April, 1887, for a Return showing how many trips were made by the steamer "Neptune," last winter, from Prince Edward Island to the mainland, the date of each trip, and the amount paid for said service; also the number of passengers. Presented to the House of Commons, 5th May, 1887.—*Mr. Perry*..... *Not printed.*
42. Return to an Address of the House of Commons to His Excellency the Governor General, dated 19th April, 1887, for copies of all applications made to the Government, and of all recommendations made in relation to the position of superintendent of the Chambly Canal; of the document appointing the present incumbent of that position; with a statement of his yearly salary and of all contingencies allowed him, and of the respective salaries paid to the two predecessors of the present superintendent. Presented to the House of Commons, 5th May, 1887.—*Mr. Trefon'aine*—*Not printed.*
- 42a. Return to an Order of the House of Commons, dated 5th May, 1887, for copies of all petitions, memorials, correspondence, orders and reports, whether made by the resident engineer or by Mr. Page, in connection with the bridge across the Welland Canal, at Welland, lately removed, and the construction of a new bridge in lieu thereof. Presented to the House of Commons, 13th June, 1887.—*Mr. Blake*..... *Not printed.*
- 42b. Return to an Address of the Senate to His Excellency the Governor General, for copies of documents in reference to the appointment of A. F. Wood, Esquire, of Madoc, as auditor or arbitrator in connection with the Murray Canal; the sums of money paid the said A. F. Wood from time to time for his services, together with the vouchers therefor, and more especially for the month of November, 1886, giving the number of days of actual service, and the amount paid to him or to his order for that month. Presented to the Senate, 23rd June, 1887.—*Hon. Mr. Flint*... *Not printed.*
43. Report on Trade Relations between Canada and the West Indies, by John P. Wylde, Commercial Agent of Canada to the West Indies. Presented to the House of Commons, 6th May, 1887, by Sir Charles Tupper..... *Printed for both Distribution and Sessional Papers.*
44. Certified copy of a Report of a Committee of the Honorable the Privy Council, approved by His Excellency the Governor General in Council on the 31st January, 1887, respecting the railway from Oxford to New Glasgow, Nova Scotia. Presented to the House of Commons, 6th May, 1887, by Hon. J. H. Pope..... *Not printed.*
45. Return to an Address of the House of Commons to His Excellency the Governor General, dated 27th April, 1887, for a copy of the Commission or other document appointing Sir Alexander Campbell and Mr. Sandford Fleming as representatives of Canada at the Colonial Conference in London, and of any instructions given to them in such capacity; and all papers respecting said Conference. Presented to the House of Commons, 9th May, 1887.—*Mr. Casey*... *Not printed.*
- 45a. Return to an Address of the House of Commons to His Excellency the Governor General, dated 2nd May, 1887, for copies of all communications received by the Canadian Government from the Imperial Government, or any of its officers, relative to the Colonial Conference which opened in London on 4th April, 1887, and of all correspondence connected therewith, and of the instructions furnished to the Canadian representatives at the Conference. Presented to the House of Commons, 15th June, 1887.—*Mr. Edgar*..... *Not printed.*
46. Report of the Montreal Flood Commission. Presented to the House of Commons, 11th May, 1887, by Sir Hector Langevin..... *Not printed.*
47. Return to an Order of the House of Commons, dated 6th May, 1887, for copies of the accounts of the revising officer for the electoral district of Kamouraska, including the cost of printing the electoral lists, the account of the revising officer's clerk and that of his bailiff, with a statement of the amount paid by the Government to each of the said officers. Presented to the House of Commons, 11th May, 1887.—*Mr. Dessaint*..... *Not printed.*

- 47a. Return to an Order of the House of Commons, dated 19th April, 1887, for a Return giving the total cost of the preparation of the voters' lists under the Electoral Franchise Act in Canada; together with a detailed statement of the cost in each electoral division for salaries of revising officer, clerk and bailiff, and travelling allowance to each, if any; giving also amount paid for printing lists, and showing to whom paid in each division: the amount paid for advertising, rent of halls, and for every other service connected therewith in each electoral division in the Dominion of Canada. Presented to the House of Commons, 11th May, 1887.—*Mr. Landerkin—*
Printed for both Distribution and Sessional Papers.
- 47b. Return to an Order of the House of Commons, dated 10th May, 1887, for a Return showing up to date the several sums paid in respect of preparation and revision of voters' lists in the county of Prince Edward for 1886, viz.: Amounts paid revising officer, clerk, bailiff, and for printing. Also amounts claimed for said revision yet unpaid. Presented to the House of Commons, 13th May, 1887.—*Mr. Platt—Not printed.*
- 47c. Certified copy of an Order in Council relating to the remuneration to be given to the revising officers. Presented to the House of Commons, 22nd June, 1887, by Hon. J. A. Chapleau—
Printed for Sessional Papers only.
48. Correspondence relative to the seizure of British American vessels in Behring Sea by the United States authorities in 1886. Presented to the House of Commons, 12th May, 1887, by Hon. G. E. Foster.....*Printed for both Distribution and Sessional Papers.*
- 48a. Additional correspondence relative to the seizure of British American vessels in Behring Sea by the United States authorities in 1886. Presented to the House of Commons, 3rd June, 1887, by Hon. G. E. Foster.....*Printed for both Distribution and Sessional Papers.*
49. Return to an Order of the House of Commons, dated 2nd May, 1887, for a Return showing how many ice-boats are owned by the Government for crossing at the capes, the number of men employed in the service during the winter of 1887, the number of trips made by said boats, the date of each trip, and the number of passengers who crossed in said boats. Presented to the House of Commons, 13th May, 1887.—*Mr. Perry—Printed for Distribution only.*
50. Return to an Order of the House of Commons, dated 2nd May, 1887, for a Return of the number of preventive officers appointed on our frontier since the 1st of January, 1886, giving the names of the several parties so appointed, with their residence and salaries. Presented to the House of Commons, 16th May, 1887.—*Mr. McMullen—Not printed.*
51. Return to an Order of the House of Commons, dated 20th April, 1887, for a Return of the quantity and value of tea imported from China and Japan, and entered at ports or outports of British Columbia, either for home consumption or in transit, from the 1st July, 1885, to the 1st April, 1887. Presented to the House of Commons, 16th May, 1887.—*Mr. Bowman—Not printed.*
52. Return to an Order of the House of Commons, dated 18th April, 1887, for a Return in detail showing the description and values of grain and animal products exported from the Dominion of Canada, from 1st July, 1886, to 1st April, 1887. Presented to the House of Commons, 16th May, 1887.—*Sir Richard Cartwright—Not printed.*
- 52a. Memorandum in connection with the seed grain advances. Presented to the House of Commons, 22nd June, 1887, by Hon. Thos. White.....*Printed for Sessional Papers only.*
53. Return from the Clerk of the Crown in Chancery, in obedience to the Order of the House of Commons, dated 11th May, 1887, for copies of Return, if any, made by returning officer for Haldimand, at election of 1887, after making his final addition, or of his declaration, if no such return was made, and of his return made after the recount by the county judge. 2. Notice of a recount or other proceedings served upon such returning officer. 3. Certificate made by the county judge of Haldimand, as to result of said recount. 4. Any judgment delivered by said county judge during, or after such recount, and of all minutes or memoranda made by said judge or his clerk containing entries or memoranda in regard to any of the ballots in dispute during such recount, showing what decision was come to in the case of each ballot, which ballots were reserved, and what judgment was delivered in regard to such reserved ballots, whether such minutes and other papers were publicly read by such judge or clerk or not during said recount. Presented to the House of Commons, 18th May, 1887.—*Mr. Casey. Not printed.*

- 53a.** Return to an Order of the House of Commons, dated 2nd May, 1887, giving the names, occupations, residences and post office addresses of the returning officers of the last election for the Dominion House of Commons, with their respective ridings. Presented to the House of Commons, 30th May, 1887.—*Mr. Somerville*..... *Not printed.*
- 53b.** Return to an Order of the House of Commons, dated 25th April, 1887, for a statement from the records of the elections to the present House of Commons, showing the number of votes polled for the respective candidates in the several electoral districts and in the various sub-divisions thereof, together with the number of ballots rejected and spoiled in each sub-division at the last general election, and each election subsequently held up to date; also the number of electors on the voters' lists, together with the population as shown by the last census of each electoral district and the municipalities thereof, whether there was an election by acclamation or a poll; and a separate statement in each case in which a recount or re-addition was made showing the changes made in every sub-division on such recount, with the number of ballots rejected which had been formerly allowed and the number allowed which had been formerly rejected, with reason so far as obtainable for such rejection or allowance. Presented to the House of Commons, 10th June, 1887.—*Mr. Mills*...*Printed for both Distribution and Sessional Papers.*
- 53c.** Return to an Order of the House of Commons, dated 25th May, 1887, for a copy of the final list of voters for the county of Montmorency, sent by J. A. Charlebois, Esq., Revising Officer for the said county, with letter of the said Charlebois accompanying the said list; also the other lists, with all additions thereto subsequently sent to the Clerk of the Crown in Chancery by the said Charlebois, with copies of letters of Charlebois accompanying the same; also the polling books of the parishes of L'Ange Gardien and St. Pierre, in the said county of Montmorency. Presented to the House of Commons, 27th May, 1887.—*Mr. Langelier (Montmorency)*—*Not printed.*
- 54.** Return to an Order of the House of Commons, dated 11th May, 1887, for a Return showing the quantity of grain of any kind in bushels carried over the Intercolonial Railway from Rivière du Loup to Halifax during the period 1st July, 1885, to 31st March, 1887, with the net amount of money received for freight thereon and passed to the credit of the same railway. Presented to the House of Commons, 25th May, 1887.—*Mr. Ellis*...*Printed for Sessional Papers only.*
- 55.** Return to an Order of the House of Commons, dated 2nd May, 1887, for copies of the bargains, agreements or contracts (not already brought down) made between the Government and the Grand Trunk Railway Company, respecting the purchase of the North Shore Railway between Montreal and Quebec, or between St. Martin's and Quebec; and also for copies of the contracts between the Canadian Pacific Railway Company and the Grand Trunk Railway Company for the purchase or transfer of the said portion of the North Shore Railway. Presented to the House of Commons, 25th May, 1887.—*Mr. Gigault*..... *Not printed.*
- 56.** Return to an Order of the House of Commons, dated 10th May, 1887, for copies of all memorials, petitions and correspondence asking for the appointment of a junior judge for the county of Elgin; also the names of all applicants for the said position since 1st January, 1886. Presented to the House of Commons, 25th May, 1887.—*Mr. Wilson (Elgin)*..... *Not printed.*
- 56a.** Return to an Address of the House of Commons to His Excellency the Governor General, dated 6th June, 1887, for a copy of the report of Judge Taylor, made under the provisions of the commission issued to him to enquire into the administration of justice by the Hon. Jeremiah Travis, in the North-West. Presented to the House of Commons, 13th June, 1887.—*Mr. Mulock*..... *Not printed.*
- 57.** Return to an Order of the House of Commons, dated 25th April, 1887, for a Return giving :—
 1. The total number of Chinese who have arrived at the different ports in the Dominion, from the 1st of January, 1886, to the 31st March, 1887, specifying the ports. 2. The amount of duty or head money collected from Chinese during that period. 3. The amount paid to the provincial Governments under the Chinese Restriction Act during the same period. 4. The number of Chinese who have entered the Dominion during the same period under return certificates, and the reports (if any) of any Customs officer with reference thereto. 5. The number of Chinese who have entered the Dominion during the same period, as students, men of science, or travellers. 6. The cost to the Dominion of administering the Chinese Restriction Act for the last fiscal year. Presented to the House of Commons, 26th May, 1887.—*Mr. Gordon*..... *Printed for both Distribution and Sessional Papers.*

- 57a. Return to an Address of the Senate to His Excellency the Governor General, dated 18th May, 1887, praying that His Excellency will cause to be laid before this House, a full Return of all Chinese entering and leaving Canadian ports; the number entering and leaving each port, and for each month since the passage of the Chinese Immigration Restriction Act in July, 1885, up to the 1st January, 1887; also the amount of revenue derived from Chinese immigration, and the cost of enforcing the Act between the aforesaid dates. Presented to the Senate, 21st June, 1887.—*Hon. Mr. McInnes*.....*Not printed.*
58. Return to an Order of the House of Commons, dated 2nd May, 1887, for copies of all correspondence, departmental orders, reports and other papers relating to Tracadie Harbor, Prince Edward Island. Presented to the House of Commons, 27th May, 1887.—*Mr. Welsh*—*Not printed.*
59. Return to an Order of the House of Commons, dated 19th April, 1887, for a return of the names of those persons, outside of the militia, who have been recommended for scrip, for services of whatever kind, in the late rebellion. Presented to the House of Commons, 30th May, 1887.—*Mr. Davin*.....*Printed for Sessional Papers only.*
60. Certified copy of a Report of a Committee of the Honorable the Privy Council, approved by His Excellency the Governor General, granting an additional annual subsidy of \$20,000 to the Province of Prince Edward Island. Presented to the House of Commons, 18th May, 1887, by Sir Charles Tupper.....*Not printed.*
61. Return to an Address of the Senate to His Excellency the Governor General, praying that he will cause to be laid before this House copies of all communications between the Dominion Government, or any Department or officer thereof, and any person whomsoever, respecting certain dynamite imported into Halifax, Nova Scotia, during the year 1885, by Messieurs H. H. Fuller & Co., and seized by the Customs authorities for alleged under-valuation. Presented to the Senate, 16th May, 1887.—*Hon. Mr. Power*.....*Not printed.*
62. Return to an Address of the Senate to His Excellency the Governor General, dated 13th May, 1887, for copies of all correspondence between the Imperial and Dominion Governments relating to the defences of British Columbia during the years 1886 and 1887. Presented to the Senate, 31st May, 1887.—*H n. Mr. Macdonald*.....*Not printed.*
63. Return to an Address of the Senate to His Excellency the Governor General, dated 22nd April, 1887, praying that His Excellency will be pleased to cause to be laid before this House a copy of the plans and reports of the late survey concerning the proposed subway between Cape Traverse, Prince Edward Island, and Cape Tormentine, New Brunswick. Presented to the Senate, 25th May, 1887.—*Hon. Mr. Howland*.....*Not printed.*
64. Return to an Order of the House of Commons, dated 11th May, 1887, for copies of all correspondence in the possession of the Department of Indian Affairs respecting the dismissal of Mr. Napoléon Giasson from his position as measurer of stone, at Caughnawaga, in the county of Laprairie. Presented to the House of Commons, 1st June, 1887.—*Mr. Dwyer*.....*Not printed.*
65. Return to an Address of the House of Commons to His Excellency the Governor General, dated 11th May, 1887, for a copy of the letter of resignation by Sir Charles Tupper of the office of High Commissioner, showing the date of such resignation; also a statement showing the date when the Government House (the residence of the High Commissioner in London) was vacated, and showing in whose care the house has been placed since its vacation; also a copy of the Commission now in force, together with any instructions which may have been given to the present Commissioner; also all correspondence between Sir Charles Tupper while High Commissioner and the Government, relating to his visit to this country, to his resignation of the office of High Commissioner, to his re-appointment, if he has been re-appointed, and relating to his acceptance, for the present, of an office in the Administration. Presented to the House of Commons, 6th June, 1887.—*Mr. Mills*.....*Not printed.*
66. Return to an Order of the House of Commons, dated 2nd May, 1887, for a Return of all reports of surveys and explorations made under the direction of the Geological Survey Office, within the past two years, in the Thunder Bay district, to the westward of Port Arthur. Presented to the House of Commons, 7th June, 1887.—*Mr. Dawson*.....*Not printed.*

- 66a. Return to an Order of the House of Commons, dated 6th June, 1887, for a Return of all reports and correspondence in the possession of the Government in relation to the substitution of new and unknown names for places in this Dominion which have been from time immemorial otherwise designated. Also all instructions showing by what particular authority a new nomenclature has been adopted in the reports of the Geological Survey for old and historic places having French and Indian names, commemorative of the early voyageurs and explorers. Presented to the House of Commons, 17th June, 1887.—*Mr. Dawson*.....*Printed for Sessional Papers only.*
67. Reports and other papers concerning irregularities committed by the Montreal Cotton Company, &c. Presented to the House of Commons, 7th June, 1887, by Hon. Mr. Bowell.....*Not printed.*
68. Return to an Order of the House of Commons, dated 25th April, 1887, for copies of all accounts in connection with the construction of the Government wharf at Kamouraska, showing the amount paid to Madame V. Taché for the purchase of her wharf, and of the contract between the Government and Madame Taché in relation thereto; also copies of the contract between the Government and Polydore Langlois, Esquire, respecting the sale of his wharf at the same place, with a statement of the amount paid to him by the Government. Presented to the House of Commons, 10th June, 1887.—*Mr. Dessaint*.....*Not printed.*
69. Return to an Order of the House of Commons, dated 2nd May, 1887, for all correspondence between the Government and Nova Scotia Central Railway Company, relating to a subsidy for said railway; also the report of the Government engineer sent to examine the work. Presented to the House of Commons, 13th June, 1887.—*Mr. Eisenhauer*.....*Not printed.*
70. Return to an Order of the House of Commons, dated 27th April, 1887, for a statement showing the various amounts paid to or claimed by William Howe and George Howe, or any other person on their behalf, for painting or other work in or about the Parliament and Departmental Buildings, Ottawa, since the 1st of January, 1884. Also Return to an Order, dated 10th May, 1887, for a statement showing the various amounts paid to William McKay, or any other person on his behalf, for painting or other work in or about the Parliament and Departmental Buildings at Ottawa, from the 1st of January, 1875, to the 31st December, 1878. Presented to the House of Commons, 13th June, 1887.—*Messrs. Holtan and Taylor*.....*Not printed.*
71. Return to an Order of the House of Commons, dated 10th May, 1887, for Return of correspondence from 1st January, 1873, to the present time, between the Department of Indian Affairs and John Walters and others, relative to purchase or lease of Main Ducks and Yorkshire Islands in Lake Ontario; also all applications for purchase or lease of said islands, all offers made to or by the Government as to purchase or sale, reports of all persons at any time appointed to appraise or value said islands, the annual rental paid by present lessee and date of expiration of such lease; also all charges preferred since 1st January, 1878, against John Walters for violation of terms of lease or regulations of Department, together with names of parties making such charges and the report of parties commissioned to investigate them. Presented to the House of Commons, 15th June, 1887.—*Mr. Platt*.....*Not printed.*
72. Certified copy of Order in Council relating to the arrangement with Messrs. Bossière Bros. & Co. —Steamship Service between France and Canada. Presented to the House of Commons, 15th May, 1887, by Sir Charles Tupper.....*Printed for Sessional Papers only.*
73. Return to an Order of the House of Commons, dated 6th June, 1887, for copies of all correspondence had between the Department of the Interior and one Peter Gray, of Moose Mountain, respecting one Edward Brokovski, an employé of the Department at Moosomin, North-West Territories, and of all letters and communications to the Department from any and all other persons bearing upon the conduct and competency in office of the said Brokovski. Presented to the House of Commons, 17th June, 1887.—*Mr. Barron*.....*Not printed.*
74. Copies of Orders in Council, correspondence, &c., relating to grants of Dominion Lands to the following railway companies: Alberta and Athabasca Railway Company; Qu'Appelle, Long Lake and Saskatchewan Railway Company; and Medicine Hat Railway and Coal Company. Presented to the House of Commons, 17th June, 1887, by Hon. Thos. White.....*Not printed.*
75. Return to an Order of the House of Commons, dated 20th April, 1887, for a Return showing the quantity of rolling stock purchased for the Intercolonial Railway during the last six months of the year ending 31st December, 1886, giving each kind of rolling stock and whether purchased under contract or otherwise, the parties from whom bought and the cost of each kind; also a statement showing what has been built in Government workshops. Presented to the House of Commons, 17th June, 1887.—*Mr. Weldon (St. John)*.....*Printed for Sessional Papers only.*

- 75a. Return to an Order of the House of Commons, dated 20th April, 1887, for a Return of the number of Pullman and parlour cars belonging to the Intercolonial Railway and used thereon, the cost of such cars, and the parties from whom the same were purchased, or by whom built for the railway. Presented to the House of Commons, 19th June, 1887.—*Mr. Weldon (St. John)*—
Printed for Sessional Papers only.
- 75b. Return to an Order of the House of Commons, dated 20th April, 1887, for a Return of the quantity of lubricating, machinery, car or other oil, furnished or delivered to the Intercolonial Railway during the year ending 31st December, 1886; the contracts under which the same were delivered; the names of the several contractors, and the several amounts paid under such contracts. Presented to the House of Commons, 17th June, 1887.—*Mr. Weldon (St. John)*—
Printed for Sessional Papers only.
- 75c. Return to an Order of the House of Commons, dated 25th April, 1887, for a detailed statement of the sums charged to capital expenditure on the Intercolonial Railway for the years 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, and 1886. Presented to the House of Commons, 17th June, 1887.—*Mr. Jones*.....*Printed for Sessional Papers only.*
- 75d. Return to an Order of the House of Commons, dated 20th April, 1887, for a Return of all casualties to trains on the Intercolonial Railway, arising from collisions, broken rails, or any other cause, for the calendar year 1886, and to 1st April, 1887; the respective causes and dates; the names of conductors, engine-drivers or other officials dismissed, suspended or fined for any such collision or other neglect of duty; the amount of damage (if any) to property in such cases; the amount of compensation paid to owners of property destroyed or damaged, as well as amount of claims for loss or damage to property (if any) unsettled. Presented to the House of Commons, 20th June, 1887.—*Mr. Weldon (St. John)*.....*Printed for Sessional Papers only.*
- 75e. Comparative Statement of revenue and expenditure, Intercolonial Railway. Presented to the House of Commons, 22nd June, 1887, by Sir Charles Tupper..*Printed for Sessional Papers only.*
- 75f. Return to an Order of the House of Commons, dated 20th April, 1887, for a Return of all contracts made during the calendar year 1886 for furnishing wire or other fencing for the Intercolonial Railway, the names of the contractors and the amount paid under each contract; also amount of purchases of wire or other fencing (if any) made without contract during the same period, and the amount paid. Presented to the House of Commons, 23rd June, 1887.—*Mr. Weldon (St. John)*.....*Not printed.*
76. Return to an Address of the House of Commons to His Excellency the Governor General, dated 10th May, 1887, for copies of all memorials, petitions and applications of one Joseph Swisher, a volunteer of the Rebellion of 1837, asking that some substantial consideration be granted him, on account of his health having been greatly impaired while serving as a volunteer during said Rebellion. Presented to the House of Commons, 18th June, 1887.—*Mr. Wilson (Elgin)*—
Not printed.
77. Return to an Address of the House of Commons to His Excellency the Governor General, dated 10th May, 1887, for copies of any and all letters addressed to the Government or any member of Cabinet by M. F. O'Donoghue, or any other person in his behalf, asking for compensation for the alleged loss or confiscation of the property of the late W. B. O'Donoghue, who was concerned in the North-West troubles of 1869-70. Also for copies of all letters, Orders in Council and other documents in the possession of the Government relating to any claims made by the said M. F. O'Donoghue. Also for a statement showing the amounts paid to M. F. O'Donoghue, or any other person on his behalf, by the Government for services rendered or on any other account. Presented to the House of Commons, 18th June, 1887.—*Mr. Barron*.....*Not printed.*
78. Return to an Order of the House of Commons, dated 6th June, 1887, for copies of surveys of a proposed line of railway from Kingsport, on the Basin of Minas, to connect with the Windsor and Annapolis Railway, together with the instructions issued to the engineers, and the correspondence and telegrams relating to the survey, or a Dominion subsidy in aid of the construction of the railway, between any member of the Government, or any officer of the Department of Railways, and any other persons. Presented to the House of Commons, 20th June, 1887.—*Mr. Borden*.....*Not printed.*
79. Copies of Despatches, &c., in relation to the proposed Imperial Institute. Presented to the House of Commons, 15th June, 1887, by Sir Charles Tupper—
Printed for Sessional Papers only.

- 79a.** Additional papers respecting the proposed Imperial Institute. Presented to the House of Commons, 22nd June, 1887, by Sir Charles Tupper.....*Printed for Sessional Papers only.*
- 80.** Papers, correspondence, &c., respecting subsidies to certain railway companies, and towards the construction of certain railways, as follows: Saint Catharines and Niagara Central Railway Company; Vaudreuil and Prescott Railway Company; Richmond Hill Junction Railway Company; Drummond County Railway Company; Joggins Railway Company; Moncton and Buctouche Railway Company; Beauharnois Junction Railway Company; Harvey Branch Railway Company; Brantford, Waterloo and Lake Erie Railway Company; Guelph Junction Railway Company; Massawippi Railway Company; Napanee, Tamworth and Quebec Railway Company; Arthabaska and Wolfe Railway Company; South Norfolk Railway Company; Jacques Cartier Union Railway Company; Teeswater and Inverhuron Railway Company; Oshawa Railway and Navigation Company; Chicoutimi and Lake St. John Railway Company; Great Eastern Railway Company; Ontario and Pacific Railway Company; Caragnet Railway Company; St. Lawrence and Lower Laurentian Railway Company; St. John Valley and River du Loup Railway Company; Lake Témiscamingue Railway Company; Carillon and Grenville Railway Company; Lake Témiscamingue Colonization and Railway Company; Leamington and St. Claire Railway Company; Cumberland Railway and Coal Company; Montreal and Champlain Junction Railway Company; Quebec and Lake St. John Railway Company; Témiscouata Railway Company; Cornwallis Valley Railway Company; Nova Scotia Central Railway Company; Tobique Valley Railway Company; Railway from Woodstock, N.B., towards Centreville; Railway Bridge over St. Lawrence River at Coteau Landing; Lake Erie, Essex and Detroit River Railway Company. Presented to the House of Commons, 21st June, 1887, by Hon. J. H. Pope.....*Not printed.*
- 81.** Return to an Order of the House of Commons, dated 10th May, 1887, for copies of all correspondence between Mr. Vankoughnet, or any other officer of the Department of Indian Affairs, and the Rev. James Robertson, Superintendent of Presbyterian Missions, in relation to the administration of Indian Affairs and the conduct of the officers of the Government in the North-West, and of all other correspondence relating to such matter. Presented to the House of Commons, 22nd June, 1887.—*Mr. S. Mcville*.....*Not printed.*
- 82.** Return to an Order of the House of Commons, dated 10th May, 1887, for copy of report of W. Pearce, D.L.S., on the Banff Springs Reservation, and of claims made to the possession of said Springs or to indemnity for not obtaining possession of them, and all correspondence and papers in connection with such claims; also a detailed statement of all expenditure in connection with the Banff Reservation, or with any claims to said Springs. Also a detailed statement of all licenses or allotments for mining, residential or other purposes already granted on the Reservation. Presented to the House of Commons, 22nd June, 1887.—*Mr. Casey*.....*Not printed.*
- 83.** Return to an Order of the House of Commons, dated 25th April, 1887, for a Return of copies of all correspondence between the Department of the Interior and the Government of British Columbia, having reference to the lands on Vancouver Island, held in trust by the Dominion Government for the Esquimalt and Nanaimo Railway Company, under the conditions of the Settlement Act, 1884. Also copies of all correspondence between the Department of the Interior and the Esquimalt and Nanaimo Railway Company, or with any person acting for or in their behalf, in any manner referring to the said railway lands. Also copies of all correspondence with any settlers or squatters upon said railway lands, or with any other person or persons with reference thereto. Also copies of all references to the Department of Justice as to the rights of settlers or squatters upon said railway lands, the form of patent issued to settlers, and the form and conditions of the patents issued, or to be issued, to the railway company; together with the report or reports of the Minister of Justice thereon. Also the number of patents that have been issued to settlers upon the said railway lands by the Department of the Interior up to this date. Also copies of any arrangement with or security from the company for the prompt issue by them up to the 19th day of December next, of pre-emption records to persons desiring to settle upon said lands under the conditions of the Settlement Act. Presented to the House of Commons, 22nd June, 1887.—*Mr. Gordon*.....*Not printed.*
- 84.** Statement showing the names of cadets who retired from the Royal Military College at Kingston, before completing the college course of instruction (four years), to accept special commissions in Her Majesty's army; and also showing the names of those who left the college on payment of \$100, and those who left without paying. Presented to the House of Commons, 22nd June, 1887, by Sir Adolphe Caron.....*Printed for Sessional Papers only.*

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85. Papers in connection with the claim of the Kingston and Montreal Forwarding Company for damages by sinking of the barge "Williams," near the entrance of the Lachine Canal. Presented to the House of Commons, 22nd June, 1887, by Hon. J. H. Pope.....*Not printed.*
86. Return to an Order of the House of Commons, dated 6th June, 1887, for copies of all correspondence, telegrams, &c., between the Customs Department and the Collector of Customs for the port of Gaspé, respecting the seizure and forfeiture of the schooner "Ste. Anne" and eight barrels of spirits confiscated for infraction of the Revenue laws of the Dominion, together with copies of accounts paid for wages and other expenses of the said schooner, and an account of the proceeds of the sale of the said spirits, made on the 6th July, 1885. Presented to the House of Commons, 22nd June, 1887.—*Mr. Langelier (Montmorency)**Not printed.*
87. Return to an Order of the House of Commons, dated 27th April, 1887, for a Return of correspondence between the Department of Railways and the Chamber of Commerce, Halifax, respecting the right of the Windsor and Annapolis Railway Company, under their agreement with the Government dated September, 1872, to use of Intercolonial Railway extension into the city of Halifax. Presented to the House of Commons, 23rd June, 1887.—*Mr. Jones*.....*Not printed.*
88. Report of the Hon. Mr. Fabre, Agent at Paris, on Commercial Relations with France. Presented to the House of Commons, 23rd June, 1887, by Hon. J. A. Chapleau—
Printed for both Distribution and Sessional Papers.
89. Return to an Address of the Senate to His Excellency the Governor General, dated the 16th June, 1887, for copy of the returns made to the Commissioner of Inland Revenue by the several parties licensed to sell alcoholic liquor in the united counties of Leeds and Grenville since the adoption of the "Canada Temperance Act" in the said counties, giving the names of the parties authorizing the sale, the quantities in each case, and the names of the parties purchasing. Presented to the Senate, 23rd June, 1887.—*Hon. Mr. Sullivan*.....*Not printed.*
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ANNUAL REPORT

OF THE

DEPARTMENT OF THE INTERIOR

FOR THE YEAR

1886.

Printed by Order of Parliament.



OTTAWA:

PRINTED BY MACLEAN, ROGER & CO., WELLINGTON STREET.

1887.

To His Excellency the Most Honourable the Marquis of Lansdowne, Governor General of Canada, &c., &c.

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the transactions of the Department of the Interior.

Respectfully submitted,

THOS. WHITE,

Minister of the Interior.

OTTAWA, 16th April, 1887.

TABLE OF CONTENTS.

	PAGE.
Report of the Deputy of the Minister of the Interior.....	ix
PART I.—DOMINION LANDS.	
Report of H. H. Smith, Commissioner of Dominion Lands.....	2
do Wm. Pearce, Superintendent of Mines.....	18
do J. M. Gordon, Inspector of Dominion Lands Agencies.....	25
Annual statement of business transacted at the several Local Land agencies in Manitoba, the North-West Territories and British Columbia.....	28
do G. U. Ryley, Clerk of Timber, Mineral and Grazing Lands.....	33
Schedule showing names of Lessees of Grazing Lands, and areas covered by Leases	37
Statement of Receipts on account of Crown Timber.....	39
Statement of Receipts on account of Grazing, Hay and Min- eral Lands.....	40
A.—Statement showing Receipts on account of Timber, Graz- ing, Hay and Mineral Lands, commencing with the fiscal year 1872-73 and ending 31st October, 1886.....	41
B.—Statement showing Receipts on account of Timber, Graz- ing, Hay and Mineral Lands, commencing with Depart- mental year 1872-73 and ending 31st October, 1886.....	42
Regulations governing the granting of yearly Licenses to cut Timber on Dominion Lands.....	43
Regulations governing the disposal of Coal Lands in Manitoba and the North-West Territories.....	52
do E. F. Stephenson, Crown Timber Agent, Winnipeg.....	53
Statement of Receipts at Crown Timber Office, Winnipeg.....	58
Statement showing saw-mills operating under License in Mani- toba, Keewatin and Assiniboia.....	59
Summary of correspondence and transactions at Crown Timber Office, Winnipeg.....	61
Statement showing comparative prices of lumber sold in the Winnipeg District during 1885 and 1886.....	61
do Thos. Anderson, Crown Timber Agent, Edmonton.....	62
Statement of Receipts at Crown Timber Office, Edmonton.....	63
Statement of correspondence and transactions at Crown Timber Office, Edmonton.....	64
Statement showing saw-mills operating under License in the Edmonton Agency.....	65
do D. J. Waggoner, Crown Timber Agent, Prince Albert	66
Statement of Receipts at Crown Timber Office, Prince Albert.	67
Statement showing saw-mills operating under License in the Prince Albert Agency.. ..	68
Statement of correspondence and transactions at Crown Timber Office, Prince Albert	69
do C. L. Gounin, Crown Timber Agent, Calgary.....	69
Statement of Receipts at Crown Timber Office, Calgary.....	70
Statement showing saw-mills operating under License in the Calgary Agency.....	71

	PAGE.
Summary of correspondence and transactions at Crown Timber Office, Calgary.....	72
Report of T. S. Higginson, Crown Timber Agent, British Columbia.....	73
Statement of Receipts on account of Crown Timber in British Columbia.....	74
General Office Returns.....	74
Statement showing saw-mills cutting timber on Dominion Lands in British Columbia.....	75
do Roger Goulet, respecting claims by Half-breeds.....	76
do Schedule of claims preferred before Half-breed Commission....	79
do John R. Hall, on National Park and Hot Springs.....	80
Order in Council and Memorandum of the Minister of the Interior, respecting mode of dealing with Hot Springs at Banff.....	84
do W. F. Whitchee, on game and fish in National Park at Banff.....	86
do Wm. Mills, in charge of Ordnance and Admiralty Lands.....	94
Statement of sales during the year.....	96
Statement showing localities on account of which moneys have been received.....	97
Statement of receipts.....	98
do J. A. Pinard, Accountant of the Department.....	99
Statement of receipts on account of Dominion Lands.....	100
Appendix A—Statement showing number of entries made at Head Office, and the Agencies of Colonization Companies.....	101
do B—Statement showing number of Letters Patent issued, and number of acres patented.....	102
do C—Statement showing Registration Districts for which lists of patents have been prepared.....	103

PART II—DOMINION LANDS SURVEYS.

Report of E. Deville, Surveyor General.....	3
Schedule showing D. L. Surveyors employed during year ending 31st Oct., 1886.....	6
do W. F. King, Chief Inspector of Surveys.....	8
do J. S. Dennis, D.L.S., examination of surveys.....	13
do Joseph Doupe, D.L.S., examination of surveys.....	16
do Otto J. Klottz, D.T.S., survey of Canadian Pacific Railway line in British Columbia, and determinations of latitudes and longitudes.....	20
do William Ogilvie, D.L.S., determination of latitudes and longitudes.....	33
do J. J. McArthur, D.L.S., topographical survey in the Rocky Mountains.....	40
do F. W. Wilkins, D.T.S., exploratory survey of Lake Winnipeg.....	43
do James F. Garden, D.L.S., sub-division survey in Kamloops District, B.C.....	51
do Thomas Fawcett, D.T.S., sub-division survey in Kamloops District, B.C.....	61
do A. F. Cotton, D.L.S., sub-division survey in New Westminster District, B.C.....	74
do Edgar Bray, D.L.S., sub-division survey in Lethbridge District...	76
do Col. A. Sproat, D.L.S., corrections to sub-division survey, near Carlton, Sask.....	78
do R. C. McPhillips, D.L.S., survey of roads near Winnipeg.....	79

	PAGE.
Report of John McAree, D.T.S., survey of roads near Winnipeg.....	80
do J. I. Dufresne, D.T.S., survey of roads near Portage la Prairie...	84
do John McLatchie, D.L.S., survey of roads from Gladstone to Fort Ellice, Man.....	86
do T. D. Green, D.L.S., survey of roads from Fort Ellice to Long Lake	88
do J. L. Reid, D.L.S., survey of road from Qu'Appelle to Prince Albert.....	90
do R. C. Laurie, D.L.S., survey of road from Swift Current to Battleford.....	91
do C. A. Bigger, D.L.S., survey of road from Red Deer River to Fort McLeod.....	93
do Geo. P. Roy, D.L.S., survey of road from Red Deer River to Edmonton.....	94
do C. E. Wolff, D.L.S., subdivision survey at Pincher Creek, Alberta.....	97
Rules and Regulations of the Board of Examiners for Dominion Lands Surveyors.....	98
Programme of the subjects of the various examinations in surveying.....	100

PART III.—GEOLOGICAL SURVEY.

Report of Dr. A. R. C. Selwyn, Director of the Geological and Natural History Survey.. ..	3
Explorations and Surveys in British Columbia	6
do do North-West Territories.....	10
do do Ontario	20
do do Quebec	27
do do New Brunswick.....	30
do do Nova Scotia.....	32
Palæontology and Zoology.....	33
List of additions to Museum.....	37
Botanical work.....	38
Chemistry and Mineralogy.....	40
Maps.....	41
Library.....	41
Visitors to Museum.....	42
Staff Appropriation, Expenditure and Correspondence.....	

PART IV.—NORTH-WEST TERRITORIES.

Report of Lieutenant-Governor Dewdney, embracing therein :—	
Session of Council—Names of Members composing the Council.....	3
Legislation—Ordinances passed by Council.....	4
Judicial	4
Schools	5
List of Justices of the Peace	6
do Notaries Public.....	6
do Coroners.....	6
do Commissioners for taking Affidavits outside of the North-West Territories	6
do Issuers of Marriage Licenses.....	7
do Fire Guardians.....	7
do Game Guardians.....	8
do Advocates	8

	PAGE.
List of Medical Practitioners	9
do do Examiners	9
Return of special permission for the importation of intoxicating liquors during the year.....	11
Report of the Board of Education for the North-West Territories... ..	16
List of School Districts authorized to borrow money... ..	30
List of Teachers.....	30
List of Schools established in N.-W. Territories	31
Extracts from Annual Report of Inspectors.....	36

ANNUAL REPORT
OF THE
DEPARTMENT OF THE INTERIOR
FOR THE YEAR 1886.

DEPARTMENT OF THE INTERIOR,
OTTAWA, 31st March, 1887.

To the Honourable Thos. White, Minister of the Interior :

SIR,—I have the honour to submit the Annual Report of the Department of the Interior for 1886. This report, as usual, covers the transactions of the Department at all its agencies from Winnipeg to New Westminster to the 31st October, but it includes also a statement of everything of consequence which has transpired in relation to the business down to the close of the calendar year.

No change of any consequence has taken place either in the Inside or Outside Service of the Department during the past year, with the exception of the retirement of the Honourable J. W. Trutch, C.M.G., who had the supervision of all matters affecting the public lands in British Columbia which are the property of the Dominion, until June of last year, when by virtue of the Act 49 Vic., Cap. 28, the jurisdiction of the Dominion Lands Board was extended to all such lands. Mr. Trutch has rendered valuable services to the Department, due acknowledgment of which was made in the communication which you addressed to him personally on the occasion of his retirement.

LAND AGENCIES.

In order to enable this Department to deal with the public lands in British Columbia situated within the belt of forty miles along the line of the Canadian Pacific Railway, finally vested in Her Majesty for the purposes of the Dominion by the Act 47 Victoria, Chapter 6, it became necessary to ascertain what lands within that belt had, before the passing of the Act in question, been alienated from the Crown by the Government of British Columbia, either by letters patent or pre-emption record. With a view to the accomplishment of this object as rapidly and accurately as possible, Mr. Trutch in 1883, acting under instructions from the Minister of the Interior, secured the services of Mr. H. B. W. Aikman, Barrister-at-law, then Registrar of Titles for the Province. Mr. Aikman immediately proceeded to make

such an examination of the books and records of the Provincial Lands and Works Department as would enable him to obtain the necessary information. This examination having been completed, the Dominion Lands Office was, last season, for the greater convenience of the public, transferred from Victoria to New Westminster, on the mainland, and Mr. Aikman was thereupon installed as Agent. Mr. Aikman's experience as Registrar of Titles for the Province has been of great value to the Department in the work in which he has hitherto been engaged, and his intimate knowledge of the British Columbia land system, upon which the regulations of this Department governing the disposal of the public lands in the Railway Belt are based, cannot fail to be of equal public consequence, especially in the settlement of disputes between conflicting claimants, and other cases likely to require the attention of the Land Board.

The completion of the line of railway of the North-West Coal and Navigation Company from Medicine Hat to Lethbridge, and the extent to which this important event tended to promote settlement upon the homestead lands in the Belly River and Fort Macleod country, rendered it necessary to erect the southern portion of what was formerly the Calgary land district into a separate agency, and Mr. E. G. Kirby, first assistant at Calgary, was appointed Agent. This and the promotion of Mr. John Flesher, to be Agent at Deloraine, are the only important changes which have occurred in regard to land agencies since the date of the last Departmental Report; and I take the opportunity of expressing gratification at the extent to which, in regard to these and all other recent appointments to positions of trust in the Department, the principle of promotion from the ranks has been recognized.

CROWN TIMBER AGENCIES.

It affords me great pleasure to be able to report that, through the joint exertions of the Commissioner of Dominion Lands and myself, Mr. E. F. Stephenson was prevailed upon to withdraw his resignation, which was mentioned in the last Annual Report. It was with great difficulty that this result was accomplished, for Mr. Stephenson naturally felt much delicacy about reconsidering a decision which had been so publicly announced. It should be mentioned that Mr. Stephenson's resignation was originally offered with a full knowledge of your intention to move Parliament to vote him an increase of salary, and that no additional monetary inducement was offered to cause him to remain in the service.

Mr. T. S. Higginson, who had been engaged since 1884 in exploring and reporting upon the timber resources of the Railway Belt in British Columbia, has been appointed Dominion Crown Timber Agent for the Province, for which his previous long experience in the lumber business qualified him well.

HOMESTEAD AND PRE-EMPTION ENTRIES.

The following statements of homestead and pre-emption entries and sales made at the agencies of the Department during the year, show that the movement of settlers towards our public lands is again on the increase, and it may be added that the prospects for the present season are regarded as very good. It will be seen that the total area disposed of exceeds that for the year 1885 by nearly one hundred thousand acres.

	1885	1886.
Homesteads.....	249,552 acres.	294,960 acres.
Pre-emptions.....	106,213 do	146,480 do
Sales.....	126,049 do	133,701 do

Underneath is a comparative table showing the land transactions of the Department, year by year, from 1872 down to the close of the last Departmental year.

Period.	Homesteads. — Area.	Pre-emptions. — Area.	Sales. — Area.	Total. — Area.
	Acres.	Acres.	Acres.	Acres.
Up to 1872.....	40,000	1,600	15,200	56,800
1873.....	138,640	2,400	16,620	155,660
1874.....	215,520	101,461	17,713	334,694
1875.....	84,480	67,314	4,908	156,702
1876.....	52,960	40,406	33,562	132,918
1877.....	145,280	107,715	170,989	423,984
1878.....	308,640	275,240	125,380	709,260
1879.....	555,296	270,178	271,343	1,096,817
Oct. 31, 1880.....	280,640	140,790	260,797	682,227
do 1881.....	438,707	263,647	355,166	1,057,520
do 1882.....	1,181,652	904,211	613,282	2,699,145
do 1883.....	970,719	659,120	202,143	1,831,962
do 1884.....	533,280	364,060	213,172	1,110,512
do 1885.....	249,552	106,213	126,049	481,814
do 1886.....	294,960	146,480	133,701	575,141

CORRESPONDENCE.

The general business of the Department has experienced an expansion far in excess of that indicated by the foregoing tables. The correspondence, for example, has enormously increased. For 1885, the number of letters received and sent was, respectively, 33,970 and 43,997. For 1886 the numbers are 60,964, and 67,973. 52,544 of the letters received and 57,300 of the letters sent had relation to the general business of the Department, and 8,420 of the letters received and 10,673 of the letters sent had reference to the business of the Geological Survey Branch. Of this correspondence, 5,700 consisted of registered letters received, and 14,438 of registered letters sent.

Herewith is submitted a statement, furnished by the Registrar of correspondence, showing the number of letters received and sent by the Department in each

year since its establishment. This statement includes for 1885 and 1886 the correspondence of the Geological Survey Branch, but does not include that connected with Indian matters during the period when they were managed in connection with the Department of the Interior.

Year.	Letters received.	Letters sent.	Total.
1874	3,482	4,150	7,632
1875	1,974	2,189	4,163
1876	2,266	3,097	5,363
1877	3,137	3,677	6,814
1878	4,642	6,009	10,651
1879	5,526	6,179	11,705
1880	8,222	9,940	18,162
1881	13,605	15,829	29,434
1882	25,500	30,300	55,800
1883	27,180	33,500	60,680
1884	27,525	33,386	60,911
1885	33,970	43,997	77,967
1886	60,964	67,973	128,937

This enormous augmentation has involved a great increase of labour to the staff of the Department, and necessarily also an increase in the staff itself. Hitherto a considerable proportion of the employees has consisted of temporary clerks, the expectation being that the business, which has been subject to more or less fluctuation, would, when it had settled down to its normal condition, render unnecessary the continuance of the services of at least some of them. The conclusion is now irresistible that whatever increase may be necessary in the staff of the Department in the future, it is most improbable that, consistently with efficiency, there can be any decrease; and it is to be feared that the "temporary" system, which was inaugurated with the best intentions, and with the view of promoting economy in the administration of public affairs, will operate rather unjustly in regard to a class of deserving gentlemen, who were eligible to be placed on the Civil List at the time they entered the service of the Department, but who are now in excess of the age prescribed by the Civil Service Act, and cannot therefore be placed on the permanent staff.

REVENUE STATEMENT.

The financial results of the transactions of the Department from year to year since its establishment, are as follows :

Fiscal Year.	Homestead and Pre-emption Fees.	Ordinary Sales.		Sales to Colonization Companies.	Totals.
		Cash.	Scrip.		
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
July 1, 1872, to June 30, 1873.	6,970 00	21,616 00	.....	.....	28,586 00
do 1, 1873 do 30, 1874.	8,290 00	17,697 00	.....	.....	25,987 00
do 1, 1874 do 30, 1875.	11,570 00	13,591 90	.....	.....	25,161 90
do 1, 1875 do 30, 1876.	4,700 00	3,704 31	320 00	.....	8,724 31
do 1, 1876 do 30, 1877.	5,620 00	1,069 90	136,955 16	.....	143,645 06
do 1, 1877 do 30, 1878.	15,370 00	2,682 24	120,159 54	.....	138,211 78
do 1, 1878 do 30, 1879.	36,026 00	8,188 44	210,904 84	.....	255,119 28
do 1, 1879 do 30, 1880.	32,358 00	41,768 47	81,685 86	.....	155,812 33
do 1, 1880 do 30, 1881.	30,682 75	62,940 84	70,818 30	.....	164,451 89
do 1, 1881 do 30, 1882.	94,228 90	1,228,424 37	50,590 84	354,036 17	1,727,280 28
do 1, 1882 do 30, 1883.	127,740 00	516,092 21	33,638 40	248,492 01	925,961 62
do 1, 1883 do 30, 1884.	70,390 00	423,113 36	40,919 67	253,713 40	788,136 43
do 1, 1884 do 30, 1885.	42,745 00	193,759 32	45,875 60	1,214 22	288,594 14
do 1, 1885 do 30, 1886.	40,481 00	76,140 41	214,657 97	.....	331,279 38

The Public Accounts make no account of the payments made to the Department in the form of scrip. This tends to create great misconception as to the true state of the revenue, and I respectfully submit that some mode of rectifying this defect be adopted forthwith. The redemption of scrip issued by the Dominion differs in no material respect, in so far as the revenue is concerned, from the redemption of ordinary public securities, the one being payable in lands, which are the property of the Government, and the other in Government money.

THE LAND BOARD.

Part I of this blue book consists, as usual, of the reports of the officers in charge of the various divisions of the work of the Department which have reference to the disposition of the public domain. The report of the Dominion Lands Commissioner indicates generally a gradual but steady improvement in the prospects of Manitoba and the North-West Territories. The people who are taking up homesteads and pre-emptions entertain practical views as to the means whereby success is to be achieved, which is more than could be said of a considerable proportion of the settlers of past years. It has occurred to me that a good way in which to illustrate this view would be to show the proportion of the entries made in each year since the acquisition of Manitoba and the North-West which have been cancelled for non-fulfilment of the residence and cultivation conditions of the Dominion Lands Act. That information will be found in the table following.

Some allowance will probably have to be made for cancellations which may yet take place of entries made during the past year, but with the perfect system of inspection now in force it is not likely that the figures will be materially altered in regard to any other period. This system of inspection, and the increased demand for homesteads and pre-emptions in the better settled districts of Manitoba, will account, in a large measure, for the number of entries which for a long time were legally null and void, the cancellation of which has only been formally made and registered during the past three or four years. Hitherto there has been in the annual blue book no means of distinguishing at what time the entries were granted, the cancellations of which from time to time have been recorded and published; but the analysis hereunder supplies the deficiency.

STATEMENT of the Number of Homesteads and Pre-emptions reported to Dominion Lands Office, Ottawa, 1874—1886; also, Number since cancelled of entries made in each Year.

Year.	Homesteads.			Pre-emptions.		
	No. of Entries.	No. Cancelled.	Percentage Cancelled.	No. of Entries.	No. Cancelled.	Percentage Cancelled.
			Per cent.			Per cent.
1874	1,376	854	62½	643	573	89
1875	499	280	57	391	186	48
1876	347	138	40	263	92	36
1877	845	388	46	594	259	44
1878	1,788	1,060	59	1,530	706	45
1879	4,068	1,501	37	1,729	1,000	58
1880	2,074	566	27	1,004	374	35
1881	2,753	812	26	1,649	541	32
1882	7,383	2,349	28	5,654	1,568	28
1883	6,063	1,101	18	4,120	734	18
1884	3,753	497	16	2,762	331	12
1885	1,858	92	4½	653	61	9½
1886	* 2,657	11	½	1,048	.....	.....

Includes 561 military homesteads of 320 acres each.

MANITOBA ACT CLAIMS.

The period within which claims to land under the Manitoba Act—that is to say, claims by virtue of actual, peaceable, and undisturbed possession at the time of the transfer, the 15th day of July, 1870—might be filed in the Department, expired on the 1st of May, 1886, and this branch of the business may now be said to be closed. At the date of the last annual report, the evidence taken before the Commissioner of Dominion Lands in regard to the conduct of Mr. Robert Lang was before the law officers of the Crown, who have since advised this Department that the evidence discloses the fact that Lang conspired to delay the issue of patents in

certain cases, and to defraud the persons entitled thereto, and that an indictment would lie against him. He, however, left for the United States before the frauds were actually discovered. He has not since come within the reach of Canadian law, and it has not been possible to proceed against him. To the best of my knowledge and belief, he has left no property in Canada. It was therefore not necessary for the law officers of the Crown to consider what could be done in the direction of punishing him through his pocket, and they advise that his offence is not extraditable. There is, I think, no recourse left at present, except to dismiss him from the public service.

INSPECTION OF AGENCIES.

The machinery for checking effectively the operations of agencies spread over so vast a country as Manitoba and the North-West has necessarily taken a long time to construct, but it can now safely be said to be in an effective condition. The inspector visits the more important of the agencies at least three or four times a year, and all of them not less than twice. Each agent is required to make his returns to the Department not less frequently than once a week, and if he is in the vicinity of a branch of any of the chartered banks he is expected to deposit the moneys paid into his office every day. During the current financial year the Auditor General has been charged with the duty of auditing the revenue, and it is gratifying to be able to say that every safeguard suggested by him with regard to the revenue of this Department had already been adopted.

Agents are now required, for the first time since the creation of the Department, to give security for the due and faithful performance of their duties. The amount of the guarantee bond at first prescribed was \$5,000, but as it would be impossible for any officer of this class under the existing system to have more than one-half that amount in his possession at any one time, it has been thought advisable to reduce the amount to \$2,500, and a proposition to that effect is at present under consideration by the Treasury Board.

PATENTS.

The number of patents issued during the year was 4,559, more than 600 in excess of the largest number issued in any previous year. The system now in operation not only offers every facility for the issue of patents rapidly, but the proportion of error is and always has been very small, as will be seen by the subjoined statement. Very few cancellations have been found necessary on account of mis-descriptions of land or mistakes in names; and the cases in which the courts have been applied to to cancel patents issued in fraud or in error have been still fewer, in

fact less than a dozen in the whole period covered by the history of the Department.

Year.	Letters Patent.	
	Issued.	Cancelled.
1874	536	6
1875	492	4
1876	375	4
1877	2,158	13
1878	2,597	32
1879	2,194	57
1880	1,704	41
1881	1,768	11
1882	2,866	11
1883	3,591	16
1884	3,837	24
1885	3,257	18
1886	4,559	17

PRE-EMPTION PAYMENTS.

In consequence of the partial failure of the crops in some localities in the North-West during the seasons of 1884 and 1885, arising out of the exceptionally early frosts which during both seasons prevailed in that country in common with the rest of the continent, it has been thought desirable to grant an extension of time to *bona fide* settlers within which to pay for their pre-emptions, and accordingly under the authority of an Order in Council dated the 7th July last, each person so in arrear on the 1st January, 1887, has been permitted to spread his payments over a period of three years, one-third of the amount being paid in the first year, one-third in the second, and the balance in full in the third, the whole being without interest during delay. The very important condition has been added to this privilege that all settlers availing themselves of it shall continue *bona fide* to reside upon their homesteads during the period to which the extension applies, and such residence must be in conformity with the provisions in that behalf contained in the Dominion Lands Act in regard to homesteads. Moreover the homesteader is required in the interval to cultivate and crop not less than forty acres, but this area may be upon the homestead or upon the pre-emption, or both, at the option of the settler. There is abundant evidence furnished in the correspondence of the Department that this timely concession has been a great boon, and it would probably be in the public interest to extend it to payments of the same class falling due within the current calendar year, on account of the drought which prevailed last summer in the central regions of the Territories, producing in those regions a great deficiency in the grain crops, upon which crops the settlers, especially in the portions of the Territories more recently taken up, are still prone to depend too exclusively. The farmers in Manitoba and the older settled regions of

the Territories are devoting themselves more largely to mixed farming, and are thus less liable to be seriously affected by the results of exceptional seasons.

DISTRIBUTION OF SEED GRAIN IN THE TERRITORIES.

The grain crop of the season of 1884 was so far a failure in the Prince Albert district that the Government, upon the circumstances being laid before them by the Lieutenant-Governor of the North-West Territories, made arrangements to supply seed for the spring of 1885; but the unfortunate Half-breed and Indian outbreak on the South Saskatchewan prevented the arrangements from being carried into effect. The condition of that district in regard to seed was naturally worse in 1885 than in 1884, for not only did the settlers not receive the seed with which it was proposed to supply them, but the disturbed condition of the country had the effect of making the seed-time so late, and the grain sown was so inferior in quality, that their crop in 1885 proved almost a total failure. In the spring of 1886 there was scarcely any seed grain in the district. Some of the farmers had none of any description, and scarcely any had the means to go into the open market and buy for themselves. You had the opportunity of acquiring an exact knowledge of the state of affairs at and around Prince Albert from personal observations made during your visit in the fall of 1885, and on the 18th January, 1886, upon your recommendation, the sum of \$46,884 was obtained by special warrant of the Governor General, for the purpose of supplying the settlers with the seed grain requisite for their prospective farming operations. The purchase and distribution of the seed was entrusted to the Commissioner of Dominion Lands, who discharged the difficult and delicate responsibility thus thrown upon him in a way which appears to have commanded the universal approval of the settlers. The very best Red Fyfe seed wheat, and the best obtainable varieties of barley and oats were supplied, and in some cases the returns obtained were very favorable; but the unusual drought of last summer operated in other cases to make the crop very much less than the average, and the expectations of the farmers that they would be able to repay out of the results of last season's cultivation the advances made to them in the manner provided for by the Order in Council, that is to say, two bushels for one, have not been realized. On the other hand, scarcity of seed at Prince Albert and Battleford, and also within the boundaries of what is generally known as the Great Regina Plain, where the soil is good but requires plentiful summer rain to produce satisfactory crops, has been so great that it has been found expedient to provide this year also for the distribution of seed grain in the districts which have suffered by the drought, as well as in others where prairie fires, in the fall of the year, destroyed the settlers' crops after they had been reaped. The purchase and distribution of the grain has been again entrusted to the Dominion Lands Commissioner, and there is no reason to doubt that the success which followed his efforts last year will be repeated. It is unnecessary to say that upon himself personally, and upon his staff, as well as upon the Department generally, this

matter has entailed a very large amount of unexpected work, and has involved also a large unexpected expenditure on service account. The estimated cost of this year's distribution is \$115,000, in addition to the balance of \$13,500 of last year's seed grain appropriation remaining unexpended at the close of the last financial year.

COLONIZATION RAILWAYS.

Attention has been directed in previous reports to the rapid extension of railway construction in Manitoba and the Territories. During the last year very satisfactory progress has been made in this direction. A branch of the Manitoba South-Western Colonization Railway has been completed about 60 miles westward from a point in Township 8, Range 4, West of the 1st Meridian, to Glenboro', and another branch of this road is in operation between Manitou and Deloraine, a distance of about 100 miles, Manitou being connected with Winnipeg by the South-Western branch of the Canadian Pacific Railway, which covers, between the two points named, a distance of about 100 miles. There are thus two lines of railway completed, equipped and running between the main line of the Canadian Pacific Railway and the International Boundary, and terminating at Winnipeg, giving to the public a very efficient and satisfactory service; and both branches will doubtless be extended further west as time and the necessities of the population require.

The Manitoba and North-Western Railway, running from Portage la Prairie in a north-westerly direction, towards Prince Albert, was completed and running before the beginning of winter to Largenburg, a distance of about 180 miles from the place of beginning, and two branches of this road, the Shell River branch, from Binscarth to Russell, and the Saskatchewan and Western branch, from Olanah to Rapid City, are in operation over a distance of 11.5 and 15.45 miles respectively. The Regina and Long Lake Railway is completed between the capital of the North-West Territories and the stretch of 60 miles of navigation formed by the waters of Long Lake, a distance of about 22 miles. The proprietors of the railway report that a steamboat will, within a very short period, be placed upon the route. Adding to these stretches of road the 109 miles covered by the North-West Coal and Navigation Company's line from Dunmore, on the Canadian Pacific Railway, to Lethbridge, at the company's coal mines, it will be seen that since 1882, in addition to the main line of the Canadian Pacific Railway and its South-Western branch from Winnipeg to Manitou, about 500 miles of colonization railway, subsidized by grants of land from the Government, have been constructed and placed in effective operation west of the Red River.

In addition to the railway construction herein mentioned, it may be stated that before the close of last season there was evidence before the Department to show that grading and track-laying had been almost completed upon 40 miles of the

Winnipeg and Hudson's Bay Railway, which has the usual land subsidy from the Dominion Government of 6,400 acres per mile within the Province of Manitoba, and 12,800 acres per mile from the northern boundary of that Province to the waters of Hudson's Bay. 3,002,968 acres have already been earned by virtue of construction and completion of their roads by land grant railways within the Province and the Territories, and when the 40 miles of the Winnipeg and Hudson's Bay Railway, already graded and ironed, have been certified by the Chief Engineer of Government Railways to be completed, equipped and running, in accordance with the requirements of the Order in Council of the 11th May, 1885, 256,000 acres will have been added to this area. There may probably be objections to this mode of encouraging the construction of railways, but it should at least have the great advantage of enlisting the interest of the moneyed corporations charged with the building and operation of these roads in the rapid settlement and development of the public domain.

MANITOBA AND NORTH-WEST HALF-BREED CLAIMS.

The time within which the claims of Half-breeds to land and scrip, by virtue of residence in Manitoba on the 15th day of July, 1870, could be filed in the Department of the Interior, expired on the 1st May last, as did the right to file other claims under the Manitoba Act. In March, 1886, Mr. Roger Goulet, Dominion Land Surveyor, of St. Boniface, Manitoba, an old and well tried servant of the public, was appointed sole Commissioner to deal with the claims of Half-breeds residing in the North-West at the time of the transfer, the object of his appointment being to dispose of such cases as might not have been brought before the Commission of the previous year. So far as concerns the portion of the Territories lying along and south of the Canadian Pacific Railway, and on the Saskatchewan, west of Prince Albert, the work of the Commission would appear to be complete; but it will be necessary during the present year that the Commission should visit the region lying between Prince Albert and the shores of Lake Winnipeg. It may very fairly be anticipated that before another year arrives all the work in connection with the extinguishment of the Indian title of the Half-breeds residing at the time of the transfer within territory which has since been ceded by Indians under treaty with the Crown, will be finished. A large proportion of the claims of last season were made by Half-breeds who had formerly ranked as Indians, and had been in receipt of annual payments and other treaty privileges through the Department of Indian Affairs. Great care was taken that only such Half-breeds of this class as were likely to be able to maintain themselves were permitted to sever their connection with their respective bands. The Department of Indian Affairs co-operated most cordially with this Department in this matter, and acknowledgments are due for the efficient and valuable services rendered by Mr. Wadsworth, Inspector of Agencies for the North-West Superintendency, and to the various Indian Agents.

No less than 602 of the certificates issued by Mr. Goulet were granted to treaty-taking Half-breeds, who last summer withdrew from their respective bands, 267 to the legal representatives of deceased Half-breeds, and but 290 to persons who were actually resident in the North-West at the time of the transfer, and at that time were eligible to be ranked as Half-breeds within the meaning of the Acts of Parliament and Orders in Council passed from time to time in that behalf. Some limit should be fixed to the time within which claims of this sort can be filed; and that time can probably be conveniently fixed on the completion of Mr. Goulet's enumeration next autumn.

BANFF HOT SPRINGS.

In consequence of a discovery of several hot mineral springs, giving promise of great sanitary and curative qualities, an Order in Council was passed on the 25th November, 1885, by which certain lands in the North-West Territories lying adjacent to Banff Station, on the Canadian Pacific Railway, in the Provisional District of Alberta, which included the springs and their immediate neighbourhood, were reserved for public uses; and about the same date, Mr. H. Sugden Evans, late Public Analyst of the Dominion, furnished to Mr. Charles Drinkwater, Secretary of the Canadian Pacific Railway Company, the following report upon specimens of the water of two of the springs, furnished to him for that purpose:—

"I have the honor herewith to report on my analysis of the samples of mineral waters from the sulphurous springs near the Banff Station, on the Canadian Pacific Railway, in the Rocky Mountains, which you have sent me for that purpose.

"I received first two wine bottles of the waters, one labelled 'waters from the Hottest Sulphur Spring, Banff, June 1st, 1885—temperature 110 degrees when issuing from the rock';—the other 'water from the spring in the cave at the lower or cooler spring.' Subsequently I received from you two large demijohns, labelled respectively 'No. 1' and 'No. 2 mineral water,' and of which you informed me, under date 22nd October last, 'jar No. 1 is filled with water from the hot spring (two miles from the cave)' called the upper or hotter spring.

"The temperature where it was filled was 112 degrees. The other jar, 'No. 2' is filled with water from the lower spring in the cave, temperature 89 degrees.

"I have made my analysis under the numbers 1 and 2 which refer to the definition above given.

"No. 1.—When the samples, both in the wine bottle and large jar, were opened, the water was perfectly clear and colorless, that in the wine bottle having a considerable dark deposit of organic remains, and a slight sulphurous odour, which rapidly passed off on exposure, and arose, in all probability, from a slight reducing action of this organic matter upon the alkaline sulphates, for the water in the large jar was entirely free from any sulphurous odour, and had but the faintest trace of organic deposit, nor were any gaseous emanations observed when it was boiled.

"A preliminary examination proved the presence of sulphuric and carbonic acids, lime, magnesia, soda, with traces of silica and organic matter; and the absence of sulphur, free or combined with hydrogen, chlorine, metallic salts and potash. Lithia was also sought for but without success.

"The complete analysis of the waters gave the following results, expressed in parts per 100,000 of water:—

Sulphuric anhydride.....	51.26
Calcium monoxide... ..	24.48
Carbon dioxide.....	16.47
Magnesium oxide.....	4.14
Sodium oxide (calculated).....	27.53
Silica	traces.
Organic matter.....	traces.
	<u>123.88</u>

Total solids per 100,000 found by actual experiment. 122.50

“Calculated as existing in the water as :—

Calcium sulphate.....	56.35
Magnesium sulphate.....	12.39
Calcium carbonate.....	3.29
Sodium sulphate.....	15.60
Sodium carbonate.....	35.73
Silica.....	traces.
Organic matter.....	traces.
	<u>123.86</u>

“No. 2.—The water of the cooler spring in the cave of which Dr. Lynch, of Winnipeg, remarks :—‘The volume of the water is much greater than the hotter or upper spring, and though of a lower temperature, it is undoubtedly from the same source, but rendered cooler by the admixture of fresh water.’

“The spring is in a cave some forty feet below the surface of the mountain, of a conical shape, the walls incrustated with ‘acid crystals’ in clusters to a depth of several inches. The water stands about five feet deep on the floor of the cave, oozing and bubbling up through a bed of black sand, of unknown depth, with a force sufficient to keep a non-swimmer from sinking.’

“The same authority also states there is a uniform temperature of about 95 degrees between the water and the atmosphere within the cave.

“When opened, both samples of this water emitted a powerful odour of sulphuretted hydrogen gas, and the quantity was immediately determined, both of that in the wine bottle and in the larger jar. In the former was found 1.154 parts hydrogen sulphide to the 100,000, and in the latter .765, a difference probably due to the fact that the smaller bottle would be corked in the cave, and would travel thence on its side, thus keeping the cork constantly beneath the water, while the larger bottle would probably not be corked until it left the cave, and from its nature would travel with the cork uppermost and unprotected by the water, so that the gas would escape.

“A preliminary examination of the water proved it to contain sulphur in combination with hydrogen, sulphuric and carbonic acids, lime, magnesia and soda, with traces of silica and organic matter, and the absence of chlorine, metallic salts and potash; lithia was also sought but not found.

“The complete analysis of the water gave the following results in parts per 100,000 :

Sulphuric anhydride.....	41.79
Calcium monoxide.....	27.93
Carbon dioxide.....	15.44
Magnesium oxide.....	2.93
Sodium oxide (calculated).....	13.61
Silica	traces.
Hydrogen sulphide.....	7.65
	<u>102.465</u>

Total solids per 100,000 found by actual experiments..... 102.10

" Calculated as existing in the water as :

Calcium sulphate.....	51.45
Magnesium sulphate.....	8.79
Sodium sulphate.....	10.06
Calcium carbonate.....	12.03
Sodium bicarbonate.....	19.37
Hydrogen sulphate.....	7.65
Silica.....	traces.
Organic matter.....	traces.

102.465

" From Dr. Lynch's observations, who describes the water as 'bubbling' up through the sandy floor of the cave, it is to be inferred that a considerable quantity of gas accompanies its exodus from its source, but of what character this gaseous matter may be there is no evidence beyond the small proportion of hydrogen sulphides retained in solution. There is probably carbonic dioxide and nitrogen emitted, and these may constitute a very important element in the medicinal value of the water, but can only be satisfactorily determined on the spot.

" From a consideration of the relative composition of the two waters, it is highly probable Dr. Lynch's conjecture is correct, and that both issue from the same source, and that the latter is cooled by co-mingling with fresh water, probably charged with calcium, carbonate and carbon dioxide.

" It would be a matter of the highest importance to obtain an accurate determination of the gaseous constituents as they emanate from the spring.

" I have examined, but not submitted to a complete analysis, the sample of sand from the floor of the cave, through which the water bubbles, and also the crystalline incrustations of the waters, samples of which you sent me. The former I find to be a very pure quartz sand, composed of colorless and transparent grains, intermixed with more or less coloured, smokey to opaque and black grains, also of quartz, and it is to these that the black specks are due, and not to particles of carbon (whereof there is not a trace) as suggested by Sir Henry Tyler, indicating the water passing through coal.

" The incrustation from the cave walls consists principally of calcium sulphate, with a little silica, alumina and iron, but contains no free sulphur, as suggested by the labelling of the sample.

" I have the honor to be, Sir,

" Your obedient servant,

" H. SUGDEN EVANS, F.C.S., &c."

The remarkable curative properties of these waters having thus been made apparent, immediate steps were taken under your instructions to make a topographical survey of the lands included in the reservation, and upon the plan prepared for that purpose, to commence the construction of roads and bridges and other operations necessary to make of the reserve a creditable National Park. Mr. Hall, the Secretary of the Department, was commissioned to proceed to the Hot Springs of Arkansas, to inquire into the system upon which those springs are managed and to make such suggestions as his observations might justify in regard to the mode of dealing with the springs at Banff. As the result of this visit Mr. Hall submitted a very valuable report, which forms No. 6 of Part I of this blue book; and upon the suggestions therein contained the Order in Council of the 6th July, 1886, was passed, regulating the disposal of the waters of the springs and the bath-houses to

be erected in connection therewith. The anticipation that a large number of people would be attracted to the springs by the combined attractions of the waters, the beauty of the scenery, and the salubrity of the climate, is already being realized to an extent which could not have been expected, considering the recent date of the discovery of these springs and the comparative insufficiency of the accommodation which it has been possible to provide within the limited time. There are, however, several comfortable hotels of fair size already erected upon the reserve, in connection with some of which bath-houses are constructed in accordance with the requirements of the regulations; and I am informed upon good authority that an average of over fifty people have been residing and undergoing treatment at these springs during the whole of the present winter. Mr. George A. Stewart, a Dominion Land Surveyor and Civil Engineer of great experience and well known professional capacity, who has had charge of the survey and laying out of the grounds, has been appointed Superintendent of the Park, and under his direction the work of preparing it for the public use has been proceeding very satisfactorily. Dr. Brett, an Ontario physician, has established a sanitarium near one of the principal springs, the Canadian Pacific Railway Company are about to erect a very handsome hotel within the boundaries of the Park, sites for residences are being laid out along the Bow River on the opposite side from the springs, and already there are applications to purchase building lots and to lease sites for hotels and sanitariums, which, when the Department is in a position to entertain them, will probably produce sufficient revenue to cover the whole cost of surveying, road making, and operations generally necessary to make the Park worthy of the great object which you had in view in ordering the reservation. Within the next few years it is likely to become one of the greatest and most successful health resorts upon the continent of America.

By the courtesy of Major Powell, Director of the United States Geological and Topographical Survey, this Department was furnished with a copy of the plan of the Arkansas Hot Springs, with the publications of the United States Government having reference to the management of the Springs, and also with similar publications respecting the Yellowstone National Park, all of which have been found valuable and useful.

An interesting report will be found appended upon the game and fish native to the National Park, made by Mr. W. F. Whitcher, late Commissioner of Fisheries of Canada, who adds many practical suggestions for our guidance in the future. As soon as the more immediately pressing work of surveying and laying out the Park is completed, the Superintendent will doubtless turn his attention to many of the matters referred to by Mr. Whitcher. I may add that upon Mr. Whitcher's suggestion, a quantity of wild rice seed from Rice Lake, Ontario, was forwarded to Banff last fall for the purpose of being sown in the lakes and ponds

situated within the reservation, and arrangements have been made for procuring a much larger quantity to be used in the same way during the ensuing autumn.

It may be well to explain that no attempt has been made to apply to the reservation the system of settlement surveys in force in the agricultural portion of the North-West, nor, on account of its physical characteristics, would it be desirable, even if it were practicable, to do so.

PARK RESERVATIONS IN THE ROCKY MOUNTAINS.

In addition to the reservations at Banff already alluded to, four mountain parks were reserved by Order in Council of the 10th October last:—

1. A park at Mount Stephen, including the country surrounding the base of the mountain and adjacent picturesque points.
2. A reservation in the vicinity of the mountain known as Mount Sir Donald, taking in the loop of the railway and adjacent territory.
3. A sufficient area in the Eagle Pass to include Griffin and Three Valley Lakes, and adjoining points of interest.
4. The amphitheatre at the summit of the Selkirk Mountains.

These parks are reserved under the provisions of clause 69 *a*, of the Dominion Lands Act of 1883, as amended by the Act 47 Victoria, chapter 25.

The whole subject of the preservation of the native forests of the country and the encouragement of tree planting in the prairie region is one which deserves your very best consideration and attention. What is being done in other countries in this matter was the subject of a report by Mr. J. H. Morgan in 1884, a summary of whose observations was published in the annual blue book of that year. The afforesting of the prairie country has lost some of its practical interest as a source of fuel supply since the discovery of the immense coal beds which underlie so vast an area of the North-West, but the relative effects of the presence and absence of trees in an agricultural region are of such vital consequence, as, in my humble opinion, to justify on the part of the Government further inquiry than it was possible for Mr. Morgan to make within the comparatively brief period for which his services were called into requisition.

TIMBER, MINERAL AND GRAZING LANDS.

It will be observed that the revenue from the three combined resources of timber, mineral and grazing lands has made very satisfactory increase during the past year, being \$35,975 in excess of the revenue of the previous year, \$26,994 of which excess is on account of grazing lands, and \$3,499 on account of timber. The Winnipeg Agency continues to produce the largest returns, although the timber

within that agency is of poorer quality and much more widely scattered than within the agencies along the base of the Rocky Mountains. Its proximity to market, however, and the numerous custom mills which have been erected in the vicinity of the various settlements during the past seven years, has made the lumber produced from this timber an article in very great demand.

TIMBER IN THE BRITISH COLUMBIA RAILWAY BELT.

The system of disposing of licenses for timber lands, irrespective of the situation of the land or the character of the timber, by public competition, has now been in operation for about two years. The effect upon the revenue, so far as concerns the prairie region, where the timber is in small patches and of inferior quality, has not been marked. The amount of the bonuses offered has been in a large degree offset by the cost of the advertising. In the Rocky Mountain region, within which, except in the case of one or two pioneer applicants, no limits were disposed of at any time except by competition, there is a considerable demand for limits of small area by lumbermen who propose to proceed immediately with the manufacture of timber, and the demand for berths of this description continues not only to be good, but very fair bonuses for the privilege of cutting the timber continue to be offered. The regulations in force in Manitoba and the North West apply to all timber lands in the railway belt in British Columbia as far west as the 120th meridian of longitude, which intersects the railway belt half way between the western end of the Shushwap Lakes and Kamloops, this being the point west of which it is believed any timber cut and manufactured is likely to find its way for export to the Pacific Ocean rather than eastward to the Territories. West of the 120th meridian the regulations are framed with a view to meeting the requirements of the trade: those in force in regard to lands along the Pacific coast being practically the same as the provincial timber laws, which were framed to meet the exigencies of the export trade to South America. Even in this belt, however, the modes of conducting the trade are gradually changing, the advent of the railway having rendered necessary the adoption of methods approximating much more nearly than before to those which obtain in the Eastern Provinces. The mill owners are increasing the cutting capacity of their saw mills, and it has been found necessary to double the maximum area which under the provincial laws and our first regulations might be held by any one licensee; that is to say, the area has been made 2,000 acres instead of 1,000.

REGULATIONS RESPECTING PERMITS TO HOMESTEADERS.

It will be seen from the appendices to the report of the Clerk in charge of Timber and Mines that the quantity of timber which may be cut under free permit by a homestead settler, who has no timber on his own land, has been considerably increased, and the dues upon fallen timber have been reduced to a mere office fee. There has been considerable misconception on the part of the public as to the

purpose of the permit system. It has to be borne in mind that the timber supply in the North-West is, as compared with its vast agricultural area, very limited, and the welfare of the settlers who have made their homesteads in the country already, as well as the interests of those who are likely to become settlers in the future, imperatively demand that the Department should use every legitimate effort to effect economy in the use of so valuable a commodity. The permit system never had in view the production of revenue; it was merely intended to enable the forest rangers and other officers intrusted with the oversight of the Crown timber, to check wasteful and unlawful cutting. There is no other way in which a forest ranger, having an extensive tract of country under his supervision, would be able to distinguish in the woods between the timber robber, slashing and cutting for mere purposes of gain, from the *bond fide* homesteader, making the timber legitimately required for the construction of his home or for his fuel supply. A great deal of the popularity or unpopularity of regulations of this kind depends upon the temper and manner of the officials whose duty it is to enforce them; and every opportunity is seized to impress upon forest rangers and other Crown timber officers the importance of civility and kindness in their dealings with the settlers. The duties of this class of officials are at all times more or less irritating, and that occasional friction should take place between them and those against whom they are called upon to enforce the law, is perhaps unavoidable. On the other hand, the best and most liberal regulations may easily be rendered unpopular and even unworkable by injudicious and over-zealous officers. The experience of the Department in this connection has been on the whole a very fortunate one. There has, at all events recently, been little or no complaint on the part of settlers, and there is every reason to believe that the timber laws and regulations are administered honestly, faithfully, and humanely.

HAY PERMITS.

It may be well to state for the public information that the permit system is never applied in regard to hay except in regions where the commodity is scarce and there is danger that the crop will be monopolized by a few to the disadvantage of the many. A glance at the accounts of the Department from year to year will show that the revenue from hay permits bears an insignificant ratio to the quantity of hay cut upon Dominion lands in the North-West, and ought to dissipate entirely the impression which seems to prevail in some quarters that an article so necessary to the success of the settler in the prairie country is being taxed with the view to the production of revenue.

THE PRICE OF LUMBER.

It is gratifying to know that the price of lumber has, by force of competition engendered by the multiplication of saw mills, been reduced to a figure very little in excess of that which prevails in the older Provinces. The Crown Timber Agent

at Winnipeg places the average for the past year at \$16 per thousand. The following is a comparative statement of the average prices of lumber within the several Crown Timber Agencies for the last three years :—

	1884.	1885.	1886.
	Per M.	Per M.	Per M.
Edmonton.....	\$25 00 to \$30 00	\$25 00 to \$30 00	\$15 00 to \$30 00
Calgary.....	30 00	25 00 to 30 00	15 00 to 20 00
Fort McLeod.....	20 00	30 00	30 00 to 37 00
Prince Albert.....	30 00 to 40 00	30 00 to 45 00	30 00 to 42 00
Winnipeg.....	15 00 to 25 00	13 50 to 25 00	16 00
Cypress Hills.....		10 00 to 15 00	25 00 to 38 00
Lethbridge.....			25 00

COAL MINES.

For the year 1885 the price of soft coal in Winnipeg averaged \$7 per ton, which was a reduction of \$1 per ton from the rates of the previous year. For 1886 the price has been still further reduced by an average of about 50 cents per ton, the prices ruling throughout the year from \$6.25 to \$6.75. There was naturally a corresponding decrease in the price of hard coal, which continues so far to reach the Winnipeg market from the anthracite coal fields of the United States. The price of soft coal at points west of Winnipeg decreases as the source of supply becomes nearer, while the price of hard coal increases on account of the increased distance from the source of supply. What appears to be a strong company from a financial standpoint has been organized to develop the anthracite mines at Banff, and if their product of coal during the next year should be upon the scale indicated by operations now going on, it is not unlikely that there will be a further decline in the price of hard coal, the benefit of which will be experienced particularly west of Winnipeg. The Canadian Pacific Railway Company are already being largely supplied with coal the produce of the country, and if development maintains the rate of progress of the last twelvemonth or two the period is near at hand when, not only will importation of fuel into the North-West cease, but the article will be exported in very large quantities. To produce this result, which to have predicted a few years ago would have been regarded as an evidence of rashness, if not of madness, requires but a little time and the necessary facilities, which are being rapidly furnished. Already the price of coal in Manitoba is practically as low on the average as in any other Province of the Dominion of Canada.

THE LIVE STOCK INDUSTRY IN THE NORTH-WEST.

In the report which I had the honour to make to your predecessor upon my visit to the North-West in 1884, I pointed out that the interests of grazing leaseholders and agricultural settlers in no sense conflicted; that on the contrary they were identical; and the Minister promptly acted upon a suggestion that all grazing

leases should be subject, so far as the even numbered sections within them were concerned, to be withdrawn from the operation of the lease when applied for for homestead and pre-emption purposes by actual settlers. That system has continued in force ever since, and, according to your own observation, has been productive on the whole of beneficial results. It has, however, apparently created in the minds of certain leaseholders doubts as to whether they are likely to continue to receive that protection under their leases which they at first expected, and there is some discussion, as will be seen by reference to the report of Mr. Pearce, who spent a large portion of his time last season amongst those who are engaged in the cattle business, as to the propriety of departing altogether from the leasing system, and adopting the plan of paying a rental per head of cattle, as in Montana and other grazing States of the American Union. It is respectfully submitted that the fears alluded to are at least premature, and are not likely to be realized. There are no doubt a considerable number of people scattered throughout the Territories at the present time who, on the pretence of a desire to become agricultural settlers, intrude themselves upon the most valuable portions of the ranches of leaseholders, and without paying rent either to the lessee or to the Government, go into the cattle business in competition with the owners of the leases and at their expense. This system is unfair and dishonest in the extreme, but no law or regulation could well be framed which would put an end to it, that would not be open to objection on general public grounds. The cure for it lies in the growth of a healthy public sentiment among the people, and better organization and co-operation on the part of leaseholders. The practice is not merely unfair and dishonest, but it is really indefensible. There are vast tracts of unoccupied grazing lands which can be acquired from the Department at a rental which need form no obstacle to any man rich enough to own a dozen head of cattle. The Department has always favored the acquisition of small tracts for grazing purposes by settlers on homestead lands, and has always offered every facility in that direction. The distinction which you have decided to draw between homestead settlers and ordinary lessees, permitting the former to acquire leaseholds up to 2,500 acres upon application, and compelling the latter to obtain their leaseholds by public competition, is another step in the direction of encouraging the leases of limited areas, and it removes the last vestige of justification for the continuance of the objectionable practice hereinbefore alluded to. As to the system of paying a rental per head of live stock, experience in the United States goes to prove that it has had more to do than any other cause with the over-stocking of the ranges and the destruction of the original prairie grasses, of which cattlemen all over the Western and North-Western States and Territories have of late years had so much reason to complain. It does not permit an individual to have any interest in a particular tract of land which he would be able to maintain in good condition for grazing; on the other hand, it offers the strongest possible inducement to the individual to get all he can out of

the tract in the shortest possible space of time, because he knows that it can only be a few years until the natural grasses shall have become extinct, and the range a barren waste. Indeed, the leasing plan was originally adopted in Canada for the express purpose of preventing the destruction of the ranges. There are doubtless difficulties to be met with by adhering to the system now in force, but with patience and prudence on the part of those interested, they can doubtless be overcome. The reservation of watering places, which has already been made upon the recommendation of Mr. Pearce, acting in concert with the stockmen, removed one difficulty which has attained to great magnitude in the United States; and now that Mr. Pearce has taken up his official residence in Calgary, where for most of the year he will be accessible to those engaged in the cattle business, and that an Inspector of Ranches has been appointed whose duties will also bring him into direct contact with the settlers and leaseholders, there is no reason why the existing machinery should not work smoothly, acceptably, and to the advantage of all concerned.

The live stock industry is rapidly attaining to proportions of magnitude in the North-West, reports received by the Department in response to circulars sent out from time to time indicating that there are at present over 100,000 head of horned cattle upon lands leased from the Government, in addition to which there are a large number owned by homestead settlers and by small ranchers who have not so far acquired either homesteads or leaseholds from the Government; and the area within which this industry may be successfully prosecuted is daily proving to be more extensive than had ever been anticipated. The lands in the Cypress Hills and Wood Mountain country, which heretofore were regarded as of little practical value, have been in great demand during the past twelve months, especially by stockmen from the United States. It is not improbable that the lands in the valley of the Red Deer River will also be in demand for this purpose at a very early day. In fact the capacity of the Canadian North-West for maintaining live stock is practically unlimited; and if the statement be well founded, which was made by Mr. J. W. Robertson, of the Ontario Agricultural College, at a recent meeting of the Western Ontario Dairymen's Association, that the average export of cattle from Canada during the past four years has been only 90,000 head per annum, it is manifest, having in view the demands of the British and foreign markets and our unrivalled facilities for reaching them, that this industry is capable of vast expansion in the course of the next decade.

The experiences of stockmen during the present winter have been more unfavourable than in any other since the experiment of ranging cattle in the North-West was originally tried, and it is not improbable that there has been considerable loss, especially among what are known as "pilgrim cattle," on account of the depth of the snow and the severity of the frosts in some districts; but it is quite

certain that these losses will be a mere bagatelle when compared to those suffered by stockmen in the grazing States of the American Union—losses which, if the statements in the public press are to be relied upon, have gone as high in some instances as seventy-five per cent. of the whole, and have averaged all over in the neighbourhood of fifty per cent.

SHEEP RAISING.

Many portions of the Territories which are indifferently suited to the ranging of cattle afford great natural facilities for maintaining sheep. Returns received by the Department show that there were during last year not less than twenty-five thousand head of sheep being herded upon lands held under lease from the Crown. The unsurpassed facilities afforded by the water powers of the Calgary country for operating mills and factories of all descriptions ought to result, within a comparatively short period of time, in the establishment of numerous branches of trade dependent more or less directly upon the raising of sheep; and with the demand for woollen goods already existing in the country between the Rocky Mountains and Winnipeg, the erection of flourishing woollen factories ought not, in the natural course of things, to be long delayed.

HORSES.

There are, according to the best information the Department has been able to obtain, about eleven thousand horses on the ranges in the Fort McLeod and Calgary districts at the present time. The visit paid to this country by two officers of the Imperial army engaged in purchasing cavalry horses, and the encouraging way in which they have spoken of the prospect of obtaining some proportion of the supply required for the British cavalry regiments from the ranges in the Territories, provided greater care is exercised in raising and breaking in the animals, has directed increased attention to this branch of the live stock business. There is also said to be a disposition among army authorities to buy two-year old horses for military purposes, and have them matured and trained under Government supervision. If this movement takes practical shape it could not fail to work to the benefit of the North-West horse breeder in possibly two ways: In the first place, it would create a readier market and would absorb the better class of animals before they had acquired any objectionable habits or suffered any physical deterioration from the conditions in which they are necessarily placed on the ranges; and in the next place it might be found, although this is the least likely of the two possible results, that the facilities afforded by the long unbroken plains of the North-West for the training of army horses would induce the Imperial Government to establish in the North-West an institution for this purpose. Live stock journals in Canada and Great Britain have pointed out the great advantages which would arise from lowering the age for purchasing army

horses from four to two years, and the measure is among the possibilities of the near future.

THE CUSTOMS DUTY UPON IMPORTED LIVE STOCK.

The great disproportion still existing between the capability of the North-West for the maintenance of live stock, and the number of horses, cattle and sheep actually in the country, will probably be regarded as affording substantial reasons for inquiring anew into the whole question of imposing Customs duties upon imported animals. The subject is one beyond the jurisdiction of this Department, but nevertheless has an important bearing upon one great division of our Departmental operations; and it is respectfully submitted that the matter deserves more than mere passing attention. About one-fourth of the whole number of animals shown by the returns to be upon the several ranges were imported during the last season. That the proportion was so large in that period is owing doubtless to some extent to the notification publicly given that the privilege of importing free of duty was to be abrogated from and after the 1st September, but the increased ratio arose also from the better knowledge of the advantages of the Canadian North-West over the country lying to the south, which has recently been obtained by United States stock raisers.

MINERAL RIGHTS IN THE BRITISH COLUMBIA RAILWAY BELT.

As long ago as August, 1884, it was known that the Government of the Province of British Columbia denied the right of the Dominion Government to the precious metals within the Railway Belt in that Province, finally vested in Her Majesty for the purposes of Canada by the Settlement Act of 1884. In 1885 the Minister of Justice, at your instance, arranged with the Attorney-General of British Columbia to submit for the decision of the Exchequer Court of Canada the question as to whether the title to the precious minerals in the Railway Belt is in the Crown as represented by the Government of Canada, or as represented by the Government of British Columbia. In December last this Department was notified by the Department of Justice that the case had been argued, and that as soon as judgment had been delivered due notification would be sent. The promised notification has not yet been received, and, as the case stands, the mining rights, so far as relates to the precious metals, are in a very unsatisfactory condition in the Railway Belt, as neither the Government of Canada nor the Government of British Columbia is in a position to grant titles. No great harm has as yet resulted from this state of affairs, for the excitement incident to a mining "boom" operates adversely to the interests of newly arrived settlers, who are apt to be induced to give up their ordinary avocations, by the pursuit of which they could soon earn a competency by dint of industry and economy, in order to try their fortunes at a business which is one of the most enticing, and at the same time one of the most uncertain under the sun; but it would be well that the difficulty should be set at rest soon.

TOPOGRAPHICAL SURVEYS.

Part Number 2 of this volume, which consists of the report of the Surveyor-General, the Chief Inspector of Surveys, and the various surveyors employed in scientific and exploratory work during the year, will be found to be more than usually interesting reading. The excellence of the service performed by this Branch of the Department, and especially the refined and exact methods by which the standard outlines have been fixed, has been the subject of reference in previous reports. The completion of the Canadian Pacific Railway telegraph, connecting the system of the Eastern Provinces with the Pacific Ocean, has enabled the Department to continue eastward as far as Winnipeg the determination of the longitudes of various stations, commenced in 1885 by Messrs. Klotz and Drummond, by communication with the United Coast Survey Station at Seattle, in Washington Territory. To anyone who takes an interest in the scientific work of the survey, the report of the Chief Inspector, Mr. W. F. King, will be profitable reading. The proof which these more precise observations afford of the accuracy of the work done in former years is what the practical public will most care to possess. The operations of last year have largely been conducted in a country presenting physical characteristics as opposite as can be conceived to those of the districts within which the work of the survey corps has in previous years been confined. It would be impossible to conceive any greater contrast than is presented by the immense prairie region, where the surveys of the past have chiefly been conducted, and the diversified scenery of the Rocky Mountain and Selkirk Ranges, the exploration and topographical survey of which has now been commenced. Much of Mr. King's report will be found somewhat too technical for the ordinary reader, although he has avoided the use of scientific terms as far as possible; but his explanation of the facility and accuracy with which lands within the railway belt in British Columbia may now be parcelled out according to the Dominion Lands system, is so plain as to be within the apprehension of everybody. It is found difficult at times to convince those who have not given the subject very close consideration that the expense of these precise and scientifically conducted surveys is not out of proportion to the practical results to be accomplished thereby. No greater mistake than this could be made, for the more scientifically conducted and accurate the survey, the more perfect is the title which may be acquired from the Crown in respect of any parcel of land described in a patent. It is hoped that during the present season Mr. Klotz, with the co-operation of Mr. King, will be able to carry his observations for the determination of longitude to the Atlantic seaboard. Mr. Ogilvie will not be able to act in conjunction with Mr. Klotz as heretofore, his services being required elsewhere.

SUB-DIVISION SURVEYS IN BRITISH COLUMBIA.

We have now obtained copies of the plans of the surveys made by the Government of British Columbia within the Railway Belt in that Province. The work of

fitting our survey operations into the condition of things produced by these provincial surveys can now be proceeded with, and the work of sub-division in British Columbia will henceforward go on as rapidly and as smoothly as it has done heretofore in Manitoba and the North-West.

It is proper to mention here that the rectangular system of survey has been applied to the lands in the Railway Belt in British Columbia, but instead of laying out the road allowances along the township and section boundaries as in Manitoba and the North-West Territories, it was thought desirable, on account of the different physical configuration of the country, merely to make provision in the area of the sections for such deduction as may be necessary when the municipalities or the Provincial Government come in future to lay out these roads according to the requirements of the several localities interested.

SURVEY OF OLD TRAILS.

The survey of old trails in the North-West Territories, commenced in 1885, was energetically prosecuted during last season; but, except in British Columbia, sub-division work was on a more limited scale than the average of previous years, the country along the lines of railway and the courses of the great rivers, which will be mostly in demand for several years to come, having already been set out for settlement. The survey of the shores of Lake Winnipeg has been completed by Mr. F. W. Wilkins, D.T.S., and we are now in a position to plot this extensive sheet of water accurately upon our maps.

AREAS OF SUB-DIVIDED LANDS.

Hereunder will be found the usual table of sub-division or settlement survey work completed in each year since the commencement of the survey, with the results of last season added:—

	Acres.	No. of Farms of 160 acres each.
Previous to June, 1873	4,792,292	29,952
In 1874.....	4,237,864	26,487
1875.....	665,000	4,156
1876.....	420,507	2,628
1877.....	231,691	1,448
1878.....	306,936	1,918
1879.....	1,130,482	7,066
1880.....	4,472,000	27,950
1881.....	9,147,000	50,919
1882.....	9,460,000	55,125
1883.....	27,000,000	168,750
1884.....	6,400,000	40,000
1885.....	391,680	2,448
1886.....	1,379,010	8,620
Total.....	70,034,462	427,467

The agricultural population these lands would sustain, on the basis of five souls to a homestead, would be 2,137,335.

EXPLORATION OF THE YUKON VALLEY.

For several years past reports have been reaching the Department from various quarters to the effect that explorations conducted by prospectors in that part of the valley of the Yukon River lying within Canadian territory have indicated the district to be of great economic value and capable of development, particularly in regard to its mineral resources; and it had become apparent that it would be of importance to the Dominion that the region should be thoroughly explored and that accurate information should be obtained with respect to it at as early a moment as possible. In May last Messrs. J. C. Phinney & Co., bankers and brokers, of Seattle, Washington Territory, wrote to the Department stating that they were satisfied, from explorations conducted on their behalf, that the district was rich in mineral deposits, that they intended erecting a quartz mill there, that they desired to obtain definite titles both for their mining locations and for the land necessary for their mills and reduction works, and that they had information that probably a thousand men would be engaged on the river and its tributaries in mining adventure during the year. A very interesting report upon the resources of the valley of the Yukon and its numerous affluents was also furnished by Mr. J. McDougall, one of the Hudson Bay Company's factors, through the courtesy of Mr. Wrigley, the company's chief trade commissioner. In view of the facts thus elicited and of other information in your possession in regard to the Yukon region, I received in September last your instructions to proceed with the organization of a joint geological and topographical expedition, which should start out early this spring. This expedition will be conducted by Dr. G. M. Dawson, Assistant Director of the Geological Survey, and Mr. William Ogilvie, of the topographical corps of the Department, Dr. Dawson, being the senior officer, to be in charge. The object of this expedition will be, as already indicated, to obtain information, topographical, geological and general, regarding this great tract of country, and particularly as to its economic value, the character and probable future prospects of the gold mining, which has already been commenced, and the available and most favourable routes for commerce and communication. Dr. Dawson proposes to approach the country by the Stickeen River, Cassiar, the Dease River, the north branch of the Liard and the Pelly branch of the Yukon. Over this route he proposes to carry out an exploration and track survey, with astronomical determinations of points; and he will likely return to the coast by the main branch of the Yukon River, the Perrier Pass and the Chilkoot Inlet. This exploration involves a journey of about 1,000 miles from point to point, not including the sinuosities of the various rivers, and should result in very important additions to our knowledge of the whole region. Mr. Ogilvie will enter the country by the Chilkoot Inlet, the Perrier Pass and the main or Lewis branch of the Yukon,

and will make an investigation of the probable position of the boundary line between Alaska and British Columbia in the Kotusk Mountains, as well as a preliminary determination of the point where the 141st Meridian, the international boundary, crosses the Yukon. He will also connect the two terminal points mentioned by an accurate survey of the Yukon River, and if it is possible to make arrangements to that effect, he will winter somewhere in the neighbourhood of Belle Isle, for the purpose of making certain astronomical determinations, and also the series of observations, magnetic, meteorological, and otherwise, conducted at stations of the International Polar Commission. The work thus outlined will probably be found of great practical value in the determination of the boundary between Canada and the Territory of Alaska. If it should be possible to provision Mr. Ogilvie's party for the winter a great advantage would be gained with regard to surveys in the succeeding season, during which, by beginning when the snow left the ground, a large amount of work might be done; and his conduct of a similar exploratory survey, under somewhat similar conditions, in the Peace River country several years ago, justifies the expectation that Mr. Ogilvie will be able to accomplish results of considerable consequence. Both Dr. Dawson and Mr. Ogilvie will be furnished with authority to take the statements and sworn depositions of miners and others wishing to record mining claims within the territory which will be traversed during the progress of their work, and to forward these to the nearest agent of Dominion Lands as prescribed by the mining Regulations, so that in regard to at least a part of the country, immediate opportunity will be furnished for the establishment of the right which attaches to priority of mineral discovery and record. This will doubtless meet the reasonable views of prospectors and miners already at work, and give them confidence in prosecuting and making known their discoveries.

GEOLOGICAL AND NATURAL HISTORY SURVEY.

Part III of this volume consists of the customary annual summary report on the progress of the work of the Geological and Natural History Branch of the Department of the Interior. During the greater part of last year the Director of the Survey was absent in England, supervising the arrangement of the specimens from the Museum exhibited at the Colonial and Indian Exhibition. Great interest has been awakened among manufacturers and capitalists in the mineral resources of Canada as illustrated by this portion of her exhibit, and important practical results are expected to arise therefrom. During Dr. Selwyn's absence his duties were performed by Dr. Dawson, Assistant Director, and I take pleasure in adding my testimony to that of Dr. Selwyn as to the marked capability displayed by Dr. Dawson in the conduct of the work of the Survey during the absence of his chief.

The publication, in separate pamphlets, of the several local reports which go to make up the regular annual or progress report of the Survey, although involv-

ing a slight addition to the cost of the printing service, is proving a wise and popular expedient. The increase in cost is quite trifling compared with the extent to which different sections of the public are afforded an opportunity of becoming acquainted with such of the operations of the Survey as interest them. Thousands will read one or other of these sectional reports who would, in all probability, have been deterred from doing so by the bulk and expense of the complete volume. There is great need for the production, at as early a day as may be found convenient, of a condensation and compilation of the results of the work of the Survey since the date of the former consolidation—1863.

I join with the Director of the survey in urging that better accommodation be found for the valuable collection of geological and natural history specimens now within the walls of the Museum. Excellent results have already followed from the removal of the headquarters of the Survey and the Museum to Ottawa; but the full advantage of the change will not have been reaped until quarters better suited for the display of this collection, and greater facilities for the office work of the Survey, have been obtained. The suggestion which has been made that a National Museum, somewhat after the pattern of the British Museum, or the Smithsonian Institute at Washington, should be erected at the Capital of the Dominion, may be somewhat in advance of public opinion upon this question, but the time has certainly come for its serious discussion.

The outline furnished of the explorations and surveys of the several officers of the branch during the past summer will be read with interest, especially those of Messrs. Bowman and McConnell, the one as bearing upon the extent of the still undeveloped wealth of the Cariboo gold region, in all probability largely confined to the quartz lodes which cannot be successfully operated with the primitive appliances of the placer miners and diggers, and require the construction of expensive machinery; the other as dealing with the probable mineral wealth of the mountains immediately east and west of the summit of the Rockies. The work of the two mining geologists, added to the staff two years ago, begins also to be interesting and valuable.

COLONIZATION COMPANIES.

By Order in Council of the 30th June, 1886, the machinery was provided by which the contracts of the various colonization companies with the Government might be terminated, and their agreements returned to the Department of the Interior for cancellation. The basis of this settlement briefly stated is, that towards the payment of the regulation price of a portion of the odd-numbered sections within their several tracts, such of the companies as desired to terminate their contracts would be credited with the whole amount in cash deposited by them to the credit of the Receiver General in the form of instalments, with \$160 on account of each settler placed by them upon the lands allotted to them for

colonization, and with such expenditures made by them as might, in your opinion, have materially conduced to the settlement of the tract; the areas to be granted to them on account of the sums thus credited to consist of lands to be patented to them at the regulation price, and to be composed of such sections and parts of sections as might be selected for that purpose by an officer to be named by you, from odd-numbered sections within the several tracts not occupied or disposed of at the date of the agreements of the companies with the Government, and of the average quality of the land composing the respective tracts.

The greater number of the companies have availed themselves of this offer, and steps are now being taken, as the reports of his selections are being received from Mr. Rufus Stephenson, Inspector of Colonization Companies, who is the officer named by you for that purpose, to close their accounts and issue letters patent to them for such lands selected by Mr. Stephenson as they may be entitled to under the arrangement stated.

GOVERNMENT OF THE NORTH-WEST TERRITORIES.

Part IV of this volume consists of the usual report of the Lieutenant-Governor of the North-West Territories, in which will be found a list of useful Ordinances passed at the Session of the Territorial Council which met at Regina on the 13th October last, and closed on the 19th November. Chief among the measures which occupied the attention of the Council was the Ordinance for the administration of civil justice, adapted from the Judicature Act of Great Britain, with such provisions introduced from the laws of Nova Scotia and Ontario as were thought suited to the circumstances of the country.

His Honour's report conveys a most encouraging impression of the progress of education in the Territories. Mention was made in the last report, of the School Law which was passed by the Council, and the change which had been thereby rendered necessary in the mode of disposing of the moneys voted by the Parliament of Canada for educational purposes in the Territories. This Ordinance seems to have produced excellent results, for it is shown by Mr. Dewdney's report that 90 schools, attended by about 3,000 pupils, were in operation during last season, as against 59 schools, with an attendance of 2,500 pupils, for the preceding year; besides which, petitions were pending at the date of the report for the establishment of eight new school districts. His Honour expects that by the 1st of April 100 schools will be in operation, with an attendance of from 3,300 to 3,500 pupils. Your special attention is respectfully directed to the report of the Board of Education, from which may be learned the vital features of the new school law, the subjects of examination prescribed for candidates for teachers' certificates, and other information as to the school system, which shows how far the educational advantages in the Territories exceed what might be reasonably anticipated in so new and sparsely settled a country.

By Order in Council of the 7th July, 1886, the Lieutenant-Governor in Council of the North-West Territories, or the Lieutenant-Governor by and with the advice and consent of the Legislative Assembly of the North-West Territories, as the case may be, was empowered, in addition to the powers already conferred on the Lieutenant-Governor in Council, or upon him acting by and with such advice and consent, to make Ordinances in relation to the following subjects, namely :—

1. Direct taxation within the territory, in order to the raising of a revenue for territorial (including municipal) purposes.

2. The incorporation of companies with territorial objects, with the following exceptions :

(a.) Such companies as cannot be incorporated by a Provincial Legislature.

(b.) Railway, tramway, steamboat, canal, transportation, telegraph and telephone companies.

(c.) Insurance companies.

I have the honour to be, Sir,

Your obedient servant,

A. M. BURGESS,
Deputy of the Minister of the Interior.

PART I.

DOMINION LANDS.

No. 1.

REPORT OF THE LAND BOARD.

OFFICE OF THE DOMINION LANDS COMMISSION,

WINNIPEG, 31st October, 1886.

Hon. THOS. WHITE,

Minister of the Interior,

Ottawa.

SIR,—I have the honor to submit for your information my annual report for the Departmental year ending 31st October, 1886, as well as the reports of Mr. William Pearce, Superintendent of Mines, and Mr. J. M. Gordon, Inspector of Dominion Lands Agencies.

The following is a summary of the year's transactions of this office, and outlines the work that has been performed by my colleagues and myself, constituting the Land Board.

REPORT of the work in the General Department of the Commissioner's Office, for the Departmental Year ending the 31st October, 1886.

Number of Letters Received.		Number of Letters Sent.				
Months.	Number.	Months.	B.	C.	D.	Total.
1885.		1885.				
November	1,630	November	277	603	702	1,582
December	1,986	December	306	528	525	1,359
1886.		1886.				
January	1,712	January	457	527	695	1,679
February	1,617	February	267	437	479	1,183
March	2,171	March	378	529	684	1,591
April	2,158	April	331	520	693	1,544
May	2,384	May	624	727	984	2,335
June	2,797	June	470	896	938	2,304
July	2,437	July	383	936	1,034	2,353
August	2,101	August	331	934	868	2,133
September	1,725	September	299	722	616	1,637
October	1,770	October	253	585	556	1,394
Total	24,488	Total	4,376	7,944	8,774	21,094

SUMMARY.

Received.			Sent.		
1885.	1886.	Increase.	1885.	1886.	Increase.
18,491	24,488	5,997	14,273	21,094	6,821

Number of applications for patents received for the twelve months ending 31st October, 1886..... 3,381

Number received last year..... 2,161

Increase..... 1,220

Number of parish claims disposed of..... 252

Number last year..... 314

Decrease 62

Number of applications for half-breed grants, Province of Manitoba 449

Number of applications for half-breed grants, North-West Territories..... 186

Number of reports received from Homestead Inspectors for the twelve months ending 31st October, 1886..... 2,164

Number received last year..... 4,162

Decrease..... 1,998

Number of applications for inspection received. 448

Number of applications carried out..... 338

do do refused..... 55

do do pending..... 55

448

The general work of the office is still, as you will observe, increasing, and has necessitated an addition to the staff to keep pace with it.

Cancellation.

The reports received from our Homestead Inspectors number 464, and cases in which action has been taken by the Board, 448. The number of cancellations this year is much below that of former years, and is due to three causes; (first), to a more faithful discharge of their duties by homesteaders; (second), to the more lenient course which the Board, at your suggestion, has adopted in dealing with settlers who were reported to be in default in the performance of their homestead duties; and (third), to the fact that the speculative entries made in 1881 and 1882, which added largely to the number of the cancellations in former years, were disposed of before this year.

Homestead Inspection.

The work devolving upon the inspectors has been augmented by the practice adopted of allowing them, as well as the local agents, to receive applications for patent. I believe that in a large proportion of cases persons desiring to apply for patent now obtain the services of an inspector who visits them at their farms. In this way settlers avoid the expense consequent upon the journey which otherwise they and their witnesses would require to make in appearing before the local agent.

The homestead inspectors without exception have discharged their arduous duties in a highly satisfactory manner, and it is due to them to say that the absence of any friction or unpleasantness in the working of our laws and regulations, as affecting land matters, may in some degree be ascribed to the patient and thorough manner in which they have done their work. The inspectors are continually moving about the country from place to place meeting all classes of the people; if any settler is in unfortunate circumstances and on that account unable to reside upon his homestead the inspector is always glad to represent that fact, or any other that may be in his favor, and is ready at all times to advise him as to his responsibility in regard to his homestead.

I have received a report from each of the inspectors, who represent an improving feeling throughout the country; they say that there is now very little, if any, expression of discontent with the land laws and regulations, and that, generally speaking, the farming community is to-day in a better position than at any time in the past.

Applications for Patent.

The number of applications received this year is 3,381, being an excess of 1,220 over last year. The new form of application now in use answers its purpose admirably. There was at first occasional objection on the part of settlers, who found themselves confronted with such a long list of questions to all of which they were expected to make full and careful answer, but the advantage of having their statements in such a complete form, preventing any necessity as a rule for after enquiry, speedily became apparent and objection ceased.

I regret to say that several cases have come under my observation in which settlers desiring to obtain recommendations for patent misrepresented the facts concerning their residence upon and cultivation of their lands. While convinced that attempts to obtain patents by fraud are far less numerous than they used to be, I am nevertheless of the opinion that it is in the public interest desirable to adopt stringent measures to utterly stamp out the evil.

Settlement Belt Claims.

The number of these cases investigated and disposed of by the Land Board is, in 1885, 314, in 1886, 252; very few now remain to be dealt with, and it is probable that the Board will be relieved in a large measure from the work consequent upon the investigation of these old standing claims. It is becoming more and more difficult to obtain necessary evidence as to the events in these cases which took place at and prior to the date of the transfer, 15th July, 1870, and it was, I am sure, a wise decision on the part of the Government to limit the time within which applications for patent under the Manitoba Act might be filed, which expired on the 1st day of May last, since when no new applications have been received.

Intelligence Service.

Offices have been kept open both at Qu'Appelle Station and Moosomin, and the gentlemen in charge have been working in conjunction with Mr. J. H. Metcalfe, who was appointed by the Department of Agriculture last winter to take charge of the Central Intelligence Office in the city of Winnipeg. In addition to the officers at Moosomin and Qu'Appelle Station, a gentleman has been associated with the service at Moose Jaw.

Mr. Metcalfe's office here is furnished with the latest pamphlets issued by the Department of Agriculture, also maps and other publications likely to interest emigrants; he is also supplied with weekly reports from the agents of Dominion Lands, and is kept fully advised of the entries that are made; he is, therefore, in a position to inform enquirers as to what lands are vacant, and having visited many parts of the North-West, possesses a knowledge of the country which enables him to give most valuable advice and assistance to new settlers.

Half Breed Scrip.

The number of applications received is 635. During last winter Mr. Roger Goulet visited St. Joe and St. John, Dakota, for the purpose of making enquiry concerning a large number of persons whose applications had been held in abeyance that evidence might be obtained to satisfy me as to where the applicants were in July, 1870, actually resident, whether in Dakota or, as in their applications alleged, upon this side of the boundary line.

Mr. Goulet's investigation, which was in every respect most thorough, resulted in the collection of very strong evidence that left me no option but to recommend the refusal of a very great proportion of the applications referred to. It was shown conclusively that a large number of claimants were at the time of the transfer residents of St. Joe and St. John, or elsewhere on the United States side of the line.

Many persons who up to a year ago had been regarded as Indians and in receipt of payments from the Dominion Government withdrew from the Indian bands with which they were associated, and made application for grants of scrip, proving that they were half-breeds and as such entitled thereto. Their withdrawal from treaty was due, in some instances at least, to the solicitation of gentlemen in Winnipeg and elsewhere who desired to purchase their scrip. At first they sold their scrip at very low prices, having apparently no idea of its value; and it was discovered that in many instances they executed powers of attorney and sold before withdrawing from treaty.

After consultation with you, it was resolved not to recognize any powers of attorney given by half-breeds who had formerly been members of the St. Peter's band of Indians unless such documents were executed in my presence, or in the presence of some member of my staff whose duty it would be to question the executer and ascertain that he knew exactly what he was entitled to and had actually received the amount of consideration which it had been agreed to pay. This action led speedily to a great improvement in the value of scrip, the grantee receiving double and sometimes treble the price that had formerly been paid. Although the examination of people who executed powers of attorney added very greatly to the work of my office, the benefit to the half-breed residents of St. Peter's was of so very material a character as to more than compensate the Department for the extra labor involved in the investigation.

The North-West Half-Breed Commission.

During last winter Mr. Roger Goulet was appointed sole Commissioner under sub-clause c, clause 81, Dominion Lands Act, 1883.

"(c). To satisfy any claims existing in connection with the extinguishment of the Indian title preferred by half-breeds resident in the North West Territories outside of the limits of Manitoba, previous to the 15th day of July, one thousand eight hundred and seventy, by granting land to such persons, to such extent and on such terms and conditions as may be deemed expedient."

I have several times had occasion to speak in eulogistic terms of Mr. Goulet's services. His high character and complete knowledge of the people whose cases he has to consider, eminently fit him for the position of Commissioner.

The work of the commission will not be completed this year, there being yet several places to visit in the neighborhood of Lakes Manitoba and Winnipeg, where there are a number of half-breeds, chiefly at Hudson Bay posts and Indian reserves.

Mr. Goulet, assisted by Messrs. N. Omer Côté and George Duck, left Winnipeg in June, proceeded to Calgary, first visiting several points on the Canadian Pacific Railway where applications were received, thence to Edmonton, Prince Albert, Victoria, Lac la Biche and Battleford.

After receiving applications at Prince Albert and Touchwood Hills, the commission came east to Elllice and on to Winnipeg, having received in all, I believe, about 1,300 applications, of which number about 1,100 were allowed and about 200 held in abeyance or refused.

Pre-emption Payments.

The arrangement which you suggested and which was authorized by Order in Council, dated 7th July last, has proved to be of substantial relief and benefit to the settlers whose cases it was designed to meet, and very many of them are taking advantage of it. A circular was addressed to all agents of Dominion Lands and received general publicity, reciting the terms of the said order and, I think, making clear the conditions under which an extension of time for these payments may be granted.

The order provides that:—

“In the case of payments due on the 7th July, one-third must be paid within one year from the first day of January, 1886, another third within two years, and the final one-third within three years from that date.

“With reference to payments accruing due during the balance of the present year, not less than one-third must be paid within the six months mentioned in sub-clause 5, clause 33, of the Dominion Lands Act, not less than one-third within one year from the date of the first payment, and the balance within two years from the date of said first payment.

“Interest is not to be collected during delay if proof is furnished by the persons in whose name the pre-emption entries stand, that they have continued *bond fide* to reside upon their homesteads during the period to which the extension applies, such residence to be in conformity with the provisions in that behalf contained in the Dominion Lands Act in regard to homesteads, and that during the said period they shall have cultivated and cropped not less than forty acres, which area may be upon the homestead, or upon the pre-emption, or upon both, at the option of the settler.

“The terms of the Order in Council will be sufficiently complied with if at the end of the period of the extension forty acres in all are under cultivation and at least six months actual residence on the homestead quarter-section in each year have been performed.”

The Claims of Squatters on Railway Lands in Southern Manitoba.

The Order in Council of 4th October, 1884, dealing with the land grant of the Manitoba and South-Western Colonization Railway, provides for the protection of each *bond fide* settler and gives him the right to retain the land occupied to the extent of not exceeding 320 acres, on paying the railway company therefor at a rate not exceeding \$2.50 per acre.

We have disposed of all, or nearly all, of these claims, and, I believe, generally to the satisfaction of the persons interested.

British Columbia.

The administration of lands within the railway belt granted by British Columbia to the Dominion is likely to largely increase the responsibility of your Department.

At present matters are in charge of Mr. H. B. W. Aikman, local agent, whose office is at New Westminster, on the main land.

As surveys proceed it will probably be necessary to open other offices for the convenience of people intending settlement in British Columbia.

Mr. Supt. Pearce and I had the pleasure of accompanying you in your visit to British Columbia last summer with the object of gaining as much information as

possible concerning the country, and of satisfying ourselves as to the regulations that ought to be adopted for the administration of lands in that Province.

The railway lands in British Columbia comprise an area of about nine and a-half million acres, forming a belt forty miles in width extending from the eastern limit of the Province of British Columbia to tide-water at Port Moody, at the head of Burrard Inlet.

The greater portion of this belt is still practically unexplored; and, as regards the extent of agricultural capabilities, but little accurate and reliable information has been obtained, except as to the New Westminster District and the valleys of the Fraser and Thompson Rivers, in the Yale-Kamloops District.

Several parties of Government surveyors are now engaged in surveying this tract in accordance, except as to road allowances, with the Dominion lands system of surveys, and, until their reports have been made to the Department, satisfactory data cannot be given, but there is good reason to believe that the available area of agricultural and pastoral lands will prove to be of much greater extent than has been estimated hitherto.

The want of roads and means of cheap transportation has been one of the chief difficulties in the way of settlement in British Columbia generally, and more especially as regards the interior. Now, however, very material changes in the conditions of settlement are being rapidly made by the Canadian Pacific Railway, which has penetrated the Province throughout the entire length of the Dominion lands and brought the numerous valleys that are everywhere interspersed along the line of the railway within easy reach of the immigrant. Much land of this character which has been heretofore considered by the early settlers as valueless; in consequence of its remoteness, will doubtless prove equal to any land in the Province either for agricultural or pastoral purposes.

Climatically speaking, the railway belt may be said to be divided into three distinct districts, which may not inaptly be called the Coast, Central and Mountain Districts.

In the first of these—known as the New Westminster District—the climate is mild, humid and equable, and it is said to closely resemble that of the South of England.

It is also one of the most fertile and beautiful districts in the Province. Rich in timber, coal, fruit, fish, game, and agricultural resources.

The available area of Dominion lands therein suitable for agricultural, fruit raising and dairying purposes, may be estimated at from 500,000 to 750,000 acres. About one-third is already settled upon. The soil of its numerous valleys, such as the Fraser, the Serpentine, Nicomekl, Campbell, Coquitlam, Pitt, Stave, Harrison, Salmon, Sumas, and the Chilliwack, with its numerous tributaries, is of a deep black vegetable mould and delta deposits underlain by a clay subsoil. On the ridges and uplands the soil is for the most part sandy and clay loams, very gravelly, with clay subsoil, easily drained, and considered unrivalled for fruit growing.

For strength and richness the delta lands are unexcelled by any in the Dominion, and, fairly cultivated, the yield per acre of wheat, barley, oats, pease, potatoes, turnips, and root crops of all kinds, is at least equal to that of any other part of the Dominion.

Wheat	25	to 40	bushels.
Barley	30	to 40	do
Oats	40	to 75	do
Pease	20	to 30	do
Hay	2½	to 3	tons.
Potatoes	20	to 30	do
Turnips	40	to 50	do

And other root crops in proportion.

The uplands, when cleared and brought under cultivation, are almost equally rich and productive, but they are more suitable for fruit. Apples, pears, plums,

cherries, and all the smaller fruits thrive uncommonly well, and are a sure crop in all parts of the district.

For size and flavor these fruits compare favorably with any in the Dominion or on the Pacific coast. Grapes, peaches, apricots and nectarines are also attracting attention. Wherever tried they have been found to do well, and, in several of the gardens of New Westminster, peaches and grapes have been grown this summer equal in size and flavor to any imported from California.

The average cost of clearing and fitting these uplands for planting or cropping, exclusive of stumping, valuing the settler's time and labor at the present high rate of wages prevailing there, is considered to be not less than \$75 per acre; whilst alder and willow bottoms, including stumping and ditching, will not average more than \$60 per acre.

These rates, however, will no doubt be less after the influence of the Canadian Pacific Railway in reducing the cost of living and the price of labor has been sensibly felt by the community at large.

For mixed farming and fruit raising New Westminster District is the garden of British Columbia.

In the central, or the Yale-Kamloops District, the climate materially differs from that of the Coast District. It is drier at all seasons, hotter in summer, with little or no rainfall, and colder in winter, the latter lasting from two to four months, with snow from six inches to two feet; generally speaking it resembles closely that of Western New York State and Ontario.

This district may be described as a mountainous plateau, more suitable for grazing than agricultural purposes.

The river bottom lands are extremely fertile. The deficient rainfall, however, is the great drawback to successful farming operations, which depend chiefly upon artificial irrigation, and large areas of otherwise fertile lands will remain unproductive until some systematic scheme shall have been adopted for conducting water for irrigating purposes from the lakes and streams of the higher levels. The system of irrigation by artesian wells, which has proved so successful in redeeming waste lands in California, has never been tried in British Columbia. There is no reason, however, to doubt but that it would prove equally beneficial in this district.

Whatever may be its future as regards grain growing and mixed farming, it is now essentially a stock-raising district, and in this respect is second to none in the Province. The best locations have, however, fallen to the choice of the first comers, but there is still ample room for the extension and development of this profitable industry. The lands in the district where artificial irrigation has been resorted to are quite as productive as those of the New Westminster District. Grain and root crops grow luxuriantly, and fruit trees of all varieties, with ordinary care, thrive well, but the crop cannot be relied upon with the same certainty as on the Lower Fraser.

As a mineral region this district occupied a prominent position in the early history of British Columbia. According to the *Official Gazette* of the 19th April, 1859, gold to the value of \$1,419,211 was taken from the benches and bars of the Fraser during the season of 1858, and many of these bars have been worked by Chinamen from that date to the present time. Several extensive silver leads are known to exist near Hope and Yale, but the want of capital, and the high price of labor and provisions, have heretofore prevented the development of these mines; now, however, under the the rapid changes already being effected by the operation of the Canadian Pacific Railway, the condition of affairs is being materially altered. Cheap living, cheap labor, and an influx of capital, will doubtless ere long place this district again amongst the most favored mining regions west of the Rocky Mountains.

The area of available land suitable for pastoral and agricultural purposes will probably not exceed 1,500,000 acres.

Fish and game of all kinds are abundant, including prairie chicken, sage hens, elk and mountain goat and sheep.

The Mountain and Kootenay District so far as relates to the railway belt may be said to be the great timber bearing region of the eastern interior, and its inex-

haustible forests of Douglas pine, spruce and cedar, are destined to become the chief source of the lumber supplies for the North-West Territories and Manitoba. Its agricultural capabilities, compared with the whole area, are limited. There is, however, good reason to believe that many of its valleys will prove extremely fertile and susceptible of supporting a considerable farming population.

As a mining region it is generally believed to be the future "El Dorado" of the Dominion. Gold, silver, copper, lead, iron and coal are known to exist in abundance in the Rocky Mountains, and in the Gold and Selkirk Ranges and other localities, but the inaccessibility of this district and the difficulty of transporting supplies have hitherto proved a great barrier which even the hardy prospector could never successfully overcome. Hence, as yet, but little is positively known as to the extent and riches of the mineral resources.

The climate of this district is similar to that of all mountain regions; severe cold with a heavy snowfall in winter, and oppressive heat in the valleys during the summer months.

General Information.

Municipal government in British Columbia is still in its infancy, few localities having yet availed themselves of the privileges offered by the Provincial Acts. Any locality, however, having an area not greater than 100 square miles and containing not less than 30 male residents may become incorporated. The country municipalities established up to this date are all situated in the New Westminster District, and consist of Richmond, Delta, Surrey, Langley and Chilliwack on the south side of the Fraser, and Maple Ridge on the north side.

The incorporated cities are Victoria, New Westminster, Nanaimo and Vancouver.

The Torrens system of registration is in force in British Columbia, as well as the old method, and it is optional with owners of property whether they place their titles under one or the other.

The public school system of British Columbia is modelled after that of Ontario, and in almost every locality where fifteen children of school age are found, a school has been established.

The immigrant on arriving in British Columbia will find most of the conveniences, as well as the protection and liberty, offered by the older Provinces; and he has also the choice of settling either within its railway belt or in other portions of the country.

The Provincial Government have large areas of good land open for settlement on Vancouver Island at Alberni, Cowichan and Comox, also on the Queen Charlotte Islands and in other localities, and on the main land in Cariboo, Lillooet and the south-eastern portion of Yale, Kamloops, and Kootenay Districts, and also in the Chilcotin country.

The class of immigrants required in British Columbia are farmers, miners, capitalists, manufacturers, mechanics, female house servants, farm laborers and mill men. To all other classes British Columbia offers no inducements for permanent settlement.

Banff Hot Springs and National Park.

In February last Mr. G. A. Stewart, D.L.S., commenced a topographical survey of the country immediately surrounding the Hot Springs, since which time the survey has been prosecuted regularly and without unnecessary delay to the present time, and it is expected that a few more weeks will suffice to bring it to completion.

It was discovered soon after his arrival that a large tract of country lying outside of the original reservation presented features of the greatest beauty, and was admirably adapted for a national park; and, on representing these facts, he was ordered to extend his operations so as to enclose a wider area, and to include all points of interest within reasonable bounds.

With this end in view his work was extended towards the north-east sufficiently to embrace Devil's Lake and its affluent, Devil's Creek, and northward to embrace

the Vermillion Lakes, these lakes, together with the Bow and Spray Rivers, adding greatly to the attraction of the scenery of the park.

The park is nine miles in width by twenty-four in length, its longer sides having a bearing of north 55° east. Its easterly limit reaches the mid-waters of the Ghost River. Its westerly limits are about four miles west of the mouth of the Spray River, and includes within its limits about fifteen miles of the Bow River, six miles of the Spray, Devil's Head and other lakes lying in Devil's Gap, and outlets of the same into Bow River.

The mountain ranges within the limits of the park may be enumerated thus: Part of the Pallisser Range skirting the Devil's Lake on the north and including the the "Devil's Head," the Beecher Range skirting the same lake on the south, the Sawback Range including Cascade Mountain, bounding Bow River and Vermillion Lakes on the north, Sulphur or Terrace Mountain forming the west side of the Bow Valley, on the east flank of which are situated the celebrated sulphur springs, and the Peak or Rundle Mountains separating the Bow from Spray Rivers. Tunnel Mountain stands like an isolated mound 2,000 feet high, and doubtless formed a part of Peak Mountain at some early date in geological history.

These Mountain ranges stand at heights from 8,000 to 10,000 feet above the sea, the elevation of the valley being about 4,500 feet. Their sublimity of form and variety of color make them objects of great attraction to the artistic eye and of interest to the general beholder.

The valleys between several mountain ranges are generally level prairie, with scattered spruce and pine that gives them the appearance of natural parks.

The lakes are chiefly the Devil's Lake and the Vermillion Lakes. The former is about twelve miles long by two wide. The water is deep and clear, with mountain ranges on either side rising thousands of feet above its surface, presenting scenery of the greatest beauty.

The Vermillion Lakes are small sheets of water linked together by short streams stretching along the north side of the Bow at the foot of the Sawback Range of mountains, extremely beautiful, and a great resort for wild fowl; fish also are plentiful.

The Bow River enters the park near the north-west angle, and, after sweeping round between the wooded banks with scarcely a perceptible current for about eight miles, begins to descend the rapids and falls a total descent of about 70 feet, forming a succession of cascades of singular beauty.

The Spray River is remarkable for its clear and cool water. It is a mountain torrent coming from the south west and joining the Bow just below the falls, not navigable for any class of craft, falling as it does about 100 feet within the limit of the park, but it adds greatly to the scenery.

The Cascade River rises between the Pallisser and Sawback Ranges, and passing down the valley approaches to within a mile of Devil's Lake where it is joined by the outlet of that lake, "Devil's Creek," and forms a junction with the Bow River near Duthil Station on the Canadian Pacific Railway.

Hot Springs.

The Hot Springs are situated on the east slope of Sulphur Mountain, at heights varying from 200 to 800 feet above the valley of the Bow. They are seven in number, as at present known, situated within a distance of two miles in extent along the fall of the mountain. The temperature varies from 120° Fahr., the hottest, to 95°, the coolest. The gauging of the hottest shows a supply of fully 150 gallons per minute. The other six springs are of nearly an equal flow, so that the aggregate supply must be about 1,000,000 gallons per twenty-four hours.

There are also numerous cold springs rising on the sides of the mountain. The Government are affording every facility for the erection of proper bath houses, and some are now in the course of construction.

Works of Construction.

During the past winter and spring many invalids visited the springs, their beneficial qualities being to a great extent established and widely known. The means of reaching the Springs were then of a most difficult nature, being simply mountain paths, cut through the thick woods and quite impassable to any but those in comparatively sound health and strength. In consequence of these difficulties, Mr. Stewart received orders from you, in May, to construct a road from Banff Station to the Hot Springs, sufficient for the conveyance of invalids in carriages.

The work was commenced early in June, and by the first week in July he was enabled to pass carriages up to the Hot Springs on a tolerably good road.

In constructing this road his already acquired knowledge of the locality enabled him to place it where it would become permanent, and now it remains simply a question of improving the existing road, which can be carried out annually at a small cost.

The crossing of Bow River was effected by means of a floating bridge, which will be replaced by a more permanent structure to be erected next year.

Roads were simply built to the Cave Spring and to the Spray River.

The works at present under construction are the Spray Bridge and the water works. The latter consists of a masonry chamber at the source of the Hot Springs, and the laying of the main pipe for the distribution of the water to the bath houses.

Two bath houses are now being erected, and several more are contemplated.

A large hotel has been built in a central and convenient locality which will, however, be enlarged to double its present capacity to accommodate the demands of the increasing number of visitors.

Leading capitalists interested in the Canadian Pacific Railway have arranged for the erection next summer of an hotel and sanitarium to cost \$100,000. Plans have been prepared and the grounds are now being laid out.

In another year it is expected that every facility will be afforded the visitor to more fully enjoy the many great attractions which the park affords, and each succeeding year, as the roads are improved and extended, fresh interest and benefit will be offered to those who may be attracted by the many advantages to be gained within the limits of our National Park.

Prince Albert Seed Grain.

In consequence of the outbreak on the North Saskatchewan during the early spring of last year, the settlers of the Prince Albert District were unable to carry on their farming operations excepting in a very limited degree, and it became apparent last autumn that without assistance from the Dominion Government it would be impossible to raise any crop this year.

This state of affairs led to the passage of an Order in Council providing for the purchase of seed grain, and I was authorized to secure the best varieties of seed obtainable, 18,000 bushels of wheat, oats and barley.

In pursuance of your instructions I at once invited tenders for the above quantities of grain, and concluded arrangements for their purchase and shipment to Qu'Appelle Station whence they were to be freighted overland by settlers to Prince Albert.

Owing to the representations made to you subsequent to the completion of my arrangements it was decided, on the advice of prominent residents of Prince Albert, that these quantities were in excess of the requirements, and I was, therefore, instructed to reduce all of them, the seed finally delivered to us being, wheat, 4,500 bushels, oats, 4,500 bushels, and barley, 3,000 bushels.

The grain was all subject to inspection and approved by Capt. Wm. Clark, Government Inspector, which afforded ample assurance to the Prince Albert settlers that their interest in the selection of the seed would be amply protected.

We were successful in obtaining an excellent quality of red Fife wheat, black and white Russian oats, and barley.

The weight of grain delivered at Qu'Appelle was 570,571 pounds, upon which we paid about 3½ cents per pound for carriage to Prince Albert, where I had detailed two of the homestead inspectors, Messrs. Rogers and Arsenault, to receive and distribute it. The prime cost of seed amounted to \$10,887; carriage to Prince Albert, \$19,282; storage, insurance and distribution, sundry expenses of management, \$2,019; making a total of \$32,189.30, being \$14,694.72 less than the sum provided by Order in Council.

Seed was advanced to 34½ settlers, an average of 1,490 pounds to each, the Government agreeing to accept repayment in kind, two bushels for one advanced, or in money, at the expiration of one year, at actual cost to the Government, the advance being secured by mortgage upon the lands of the borrowers, or by bond or lien in cases where the patent or certificate of recommendation for patent had not issued.

From reliable reports I have ascertained that the product from this seed has been excellent in quality, and in quantity as satisfactory as could be expected.

The action of the Government in this matter has certainly ample justification; the effect has clearly been to place the Prince Albert settlement in a most satisfactory condition, and I trust that careful cultivation over an increased area next season will enable the settlers to derive the fullest possible advantages from the changed and improved seed.

It is probable, from what I can learn, that the settlers will largely repay the advance "in kind," and that the grain which we may receive will be used by the Mounted Police force and Indian Departments, so that the cost of this advance to the Government will prove to be merely nominal.

Mr. Hugh Montgomery was specially instructed to enquire most carefully as to the result of the harvest, and into matters relating to the seed-grain advanced generally.

He personally visited each farm, inspected the crop and took notes of the acreage sown and the approximate yield per acre, very few of the farmers having at that time threshed.

As the result of this inspection he found that the number of acres of wheat sown in the district was 1,857, yielding about 20,269 bushels; of oats, 1,398 acres, yielding 13,514 bushels; of wheat and barley, 1,491 acres, yielding 9,724 bushels.

General satisfaction was expressed by the settlers as to the quality of the seed received from the Government. The wheat was specially good and was pronounced by all who sowed it to be well adapted to the climate and soil of the district, the grain when threshed being equal to the seed.

Colonization.

The effort to secure a good class of immigrants from Northern Europe and elsewhere has resulted during the past year in the formation of several colonies that seem likely to succeed.

By your authority, reserves have been made of small tracts of land situate in various parts of the country, which are known by the national name of the people whom respectively it is sought to attract to take up land therein.

The work of colonizing is being energetically undertaken by some of the railway companies assisted by the agents of the Government abroad.

The following brief description of several of these colonies will indicate, to some extent, what, up to the present time, has been accomplished.

New Sweden—Scandinavian Colony—Townships 17 and 18, Ranges 17 and 18, West Principal Meridian.

Sixty-nine persons made entry during 1885 and 1886, and many of them have now substantial improvements. Nearly all are Scandinavians, having for the most part a knowledge of agriculture, a few being possessed of considerable means. This settlement has been largely assisted by the Manitoba and North-Western Railway.

Company. It bids fair to become successful and to form the nucleus of a considerable settlement of immigrants from Northern Europe.

New Hungary—Townships 16 and 17, Range 16, West Principal Meridian.

Seventeen persons have made entry. They have during the past season been employed on the Manitoba and North-Western Railway, and, it is said, have earned sufficient money to carry them through the winter. Nearly all have erected log houses; they have a few acres broken, some young cattle, and will probably turn out to be good settlers.

Esterhazy—Hungarian Settlement.

Townships 19 and 19a, Ranges 1, 2, 3 and 4, West 2nd Meridian, have been temporarily reserved to assist in the formation of a colony under the auspices of Count Paul d'Esterhazy.

The Count's project is to induce settlement upon farms in the North-West of a large number of Hungarians, many of whom are at present residing in Pennsylvania. It is understood that his efforts are being directed to the attraction of those persons as well as others now resident in Hungary.

He has arranged for advances of money under the new lien clause of the amendments to the Dominion Lands Acts adopted last session, and expects that the knowledge of agriculture possessed by his countrymen will be, with such assistance, applied successfully in the North-West, under conditions of soil and climate somewhat similar to those of Hungary.

The lands for the colony have been carefully selected, and afford excellent soil, water and timber.

New Alsace Colony, German—Township 24, Ranges 21 and 22, West 2nd Meridian.

About forty-seven entries have been made, there being now some thirty-two settlers in residence upon their homesteads. Three hundred acres are under cultivation, 150 head of cattle owned by these colonists who, it is said, are also well supplied with farming implements, and some of them possessed of considerable means.

These settlers have erected substantial buildings, and are represented as being contented with their circumstances and prospects.

Hohenlohe—Township 21, Range 31, West Principal Meridian.

This is the nucleus of a German colony, and, although not many of the settlers have commenced to reside upon their homesteads, about thirty have made entry, and have been employed during the summer on the Manitoba and North-Western Railway, earning wages that will enable them to erect houses during the winter and to go into residence next spring with tolerably good equipment.

They appear to be thoroughly satisfied with the prospect before them of being able to make comfortable homes for themselves.

This settlement is at the present terminus of the Manitoba and North-Western Railway, and it is expected that it will be largely increased by German immigrants next spring.

Roumanian Colony "New Tulscha"—Established August, 1886.

This colony is located in Township 19, Ranges 16 and 17, West 2nd Meridian, eight miles from Balgonie, and 341 miles west of Winnipeg.

During the season of 1885, the sum of \$1,120 was advanced to eleven settlers, being in sums ranging from \$63 to \$150 to each settler, and invested in stock and implements.

At the beginning of the present season, 16 homesteads were entered for. There have been added to the colony, up to the present date, seven additional homesteaders. Aside from these, a small settlement has been made south of the line of road, about three miles from Balgonie, in Township 17, Range 16, to which, although really a

portion of the New Tulseha Settlement, the residents have given the name of "Josephthal."

During the summer a further advance was made to five of the new arrivals, amounting to \$768, which has been invested in the same manner as the first advance.

At the present time there are 213 acres ready for seeding next year. Very comfortable houses have been erected, and a new church and school are under way.

The settlement at present consists of ninety-four persons, of whom thirty-two are males, twenty-five females, and thirty-seven children.

Twenty-seven homesteads have been entered for, five of the males being under homesteading age.

The number of live stock owned within the settlement is 116 head.

Plenty of hay has been put up for the winter months. Each settler has a good stock of poultry, and will find these and their other live stock of great assistance in helping them through the winter. Wood for fuel is plentiful in bluffs near at hand, and an abundant water supply is found in the lakes and ponds.

Coal.

The development of the coal mining industry in the North-West has been most satisfactory, mines are now in operation in the following places:—Medicine Hat, Lethbridge, and Banff.

The benefit that this development has been to the country may be indicated to some extent by a comparison of the prices of coal here three or four years ago and now.

Up to the present time the only hard coal used in Manitoba, and, I believe, in the western portion of the country, comes from Pennsylvania; it is said, however, that near Banff Station anthracite coal has been discovered and is now being mined; should this prove to be the case a very large amount of money that would otherwise go to coal merchants in the south will be retained in this country, and the price of anthracite coal will in all likelihood be reduced from \$10 to \$7 or \$8 per ton.

The North-Western Coal and Navigation Company, whose mine is at Lethbridge, employ about 350 men on their mine and railway, in connection with both of which enterprises they have already expended about a million and a-half of dollars. The daily output of coal is said to be between 300 and 400 tons.

The approach of the Manitoba and South-Western Railway in the direction of the Souris coal fields will very likely induce some activity in development of mines during 1887. There is a vast area of coal land, and although the surface coal is not of a very good quality it is believed that in sinking shafts to a considerable depth the quality will greatly improve. Should this prove to be the case the "Souris" coal will be largely consumed in Manitoba.

Well Boring.

In Assiniboia, south of the Canadian Pacific Railway, and in the vicinity of Moose Jaw and Regina, the settlers found it to be very difficult, and in many cases impossible, to procure water by digging wells. This in dry years is a very serious matter, and unless water could be obtained at moderate cost it became apparent that the large extent of excellent agricultural land south of the railway in the localities referred to would remain unoccupied. About a year ago you authorized me to purchase a well boring machine to be used by the settlers in the neighbourhood of Regina. It has been freely used by the settlers over a considerable area of country, and a number of wells have been sunk to an average depth of not less than 100 feet, in many of which water was found.

A second machine with full equipment was this summer bought for use in the Moose Jaw District. It has not been sufficiently long at work to enable me to report very much progress, but I am led to believe that at Regina and Moose Jaw and indeed throughout the whole of that tract of country it is possible to secure a supply of water by boring on almost any section.

Railway Construction.

Looking first to Manitoba we find that in the past four or five years about 1,000 miles of railway have been constructed and are now in operation, traversing the central and southern portions of the province, and affording easy transport facilities to the settlers of almost every district.

The Treherne Branch of the Manitoba and South-Western Railway has this year been extended to Section 10, Township 7, Range 14, West Principal Meridian, and is now in operation for 105 miles from Winnipeg.

The North-Western Railway has been extended to Section 27, Township 21, Range 30, west Principal Meridian, 180 miles distant from Portage la Prairie, and branches have been constructed to Rapid City, fifteen miles, and to Russell, ten miles.

It will be seen that at the present time the province is, as regards transport facilities, in a satisfactory position, and it is not improbable that, as a consequence, lands owned by railway companies and individuals—as yet unoccupied—will now come into demand.

Hudson's Bay Railway.

Work on this line has commenced, and already forty miles of road-bed have been graded and prepared for ties and rails.

It is generally felt among the residents of Manitoba that this work is a prime necessity, and that when completed to Churchill on Hudson's Bay, and in operation, the country will benefit enormously.

In the North-West Territories.

Outside the Province of Manitoba there are, in addition to the Canadian Pacific Railway, the North-West Coal and Navigation Company's Railway, 109 miles in length, the Regina and Long Lake Railway, and the Manitoba and North-Western Railway—the extension of the last named line having been carried beyond the boundary of the province in the direction of Prince Albert, which, it is supposed, will ultimately become the western terminus.

General Condition of the Country.

The past season's crop is not so bountiful as early indications promised, but throughout the whole of the North-West the grain harvested has been untouched by frost and of excellent quality.

The increase in cattle is large even outside what is known as the "ranching" country. In every district the effort of the settler is directed to improving and enlarging his herd of cattle and to the accumulation upon his homestead of all the stock and other accessories that are everywhere essential to thrifty and economical farming.

Hogs and poultry are now extensively raised, and some attention is being directed to sheep raising which is, probably, destined to become one of the most profitable of our pastoral industries.

A considerable exportation of hogs and poultry is now taking place from several of the counties in Manitoba, where but three or four years ago it was the exception to find a farmer with more than two or three head of stock, large or small.

Cheese is being manufactured in several places, and it is not unlikely that, in a few years, it will not be imported from the east, as at present, for consumption here.

Settlers in Manitoba and the North-West are still to some extent hampered by debts incurred for agricultural implements, and have this year lost appreciably by prairie fires which have been prevalent everywhere; nevertheless they are, as a rule, contented and hopeful of the future.

In Alberta there are said to be now about 115,000 cattle grazing, and ample room for many additional thousands. The district for pastoral purposes has greatly

exceeded the expectations formed some years since concerning it, and the fact that several ranchmen from Montana have come in and taken up locations there is significant.

The localities in which settlement has chiefly taken place during the year are, in the vicinity of the Souris coal fields, west of the Assiniboine River (on route of the Manitoba and North-Western Railway), in the Lake Dauphin District, and in the Qu'Appelle Valley between Ranges 2 and 20, West 2nd Meridian.

The area of cultivable land in these localities available for settlement is still extensive.

Lake Dauphin has attracted considerable interest in consequence of the excellence of its agricultural and pastoral resources, and the reported discovery of petroleum in the valley of the Vermillion River where several claims have been taken up under the mining regulations. It is said that the land at present cultivable in the Dauphin District is confined to the surveyed townships, but that there is a large tract north of the Valley River—unsurveyed—covered by a dense growth of poplar—which is rapidly being changed into arable prairie land by the annually recurring fires that every year denude large tracts of timber.

This district is just now somewhat inaccessible, but it is in contemplation to construct a good waggon road across the Riding Mountains from Minnedosa; when this has been done it is probable that the available lands will quickly be settled upon. The soil is excellent, and there is said to be an abundance of good grass, timber and water.

Such material damage has resulted this year from prairie fires throughout the whole North-West, that it is to be hoped the Provincial Legislature and the North-West Council may adopt legislation to check this evil.

Another subject to which I think these legislative bodies might profitably turn their attention, is the settlement of lands alienated from the Crown, and at present lying unoccupied and unproductive.

There is an enormous area of land in the Province of Manitoba alienated from the Crown, which, at the present time, is uncultivated and not settled upon.

Some of it has been patented to homesteaders, but a large part has been granted to railway companies and sold to individuals.

It seems to be particularly desirable that measures should be adopted which, to some extent at least, would expedite the settlement of these lands; but this, of course, is a matter for the Province to consider.

If steps were taken immediately to lower Lake Manitoba and reclaim the vast extent of wet land to the east, west and north of the lake, I believe that two or three millions of acres would, in a comparatively short time, be added to the cultivable and productive lands of Manitoba.

Mr. Pearce, Superintendent of Mines, on the 31st of March, in a memorandum addressed to you on the subject, refers to Professor Hind's report on the tract of country bounded on the west by the Duck and Riding Mountains, and on the east by Lake Winnipeg. Professor Hind stated that at a comparatively recent date the whole of it had been a huge lake; that by wearing away the outlets, first, presumably, of Lake Winnipeg, afterwards of Lake Manitoba, the country has assumed its present condition; that he believed at no very distant date capital would be employed to drain Lakes Manitoba and Winnipegosis; he also alluded to the very important fact in this undertaking, which would be the improvement of the climate of Manitoba if those large ice fields, which these lakes invariably are in the spring, were removed. Owing to their shallowness, a very large percentage of the waters, probably 60 per cent., is converted into ice; that in many places ice forms solidly to the bottom, and remains there until by action of the sun it becomes dissolved. There is no destruction of the ice by waves, consequently in many places it remains frequently on into June in huge fields. The same observations apply to that portion of Lake Winnipeg south of the narrows north of Big Island.

Mr. Pearce proceeds to say that were Lake Manitoba lowered, say ten feet, by blasting out to that depth a ledge of limestone which crosses its outlet at Fairford.

its area would be reduced probably 75 per cent. Then, by cutting a canal across Meadow Portage, Lake Winnipegosis could be lowered at least twenty feet. This would make both lakes more like rivers than lakes, and in that case they would be more valuable for navigation purposes than in their present condition.

I have the honor to be, Sir, your obedient servant,

H. H. SMITH,
Commissioner.

No. 2.

OFFICE OF THE DOMINION LANDS COMMISSION,

WINNIPEG, 31st October, 1886.

SIR,—I have the honor to transmit through you, for the information of the Hon. the Minister of the Interior, my annual report for the departmental year ending this date.

During the month of November, 1885, I was engaged with you in Winnipeg, chiefly on matters referred to the Land Board for settlement, and also at that time accompanied you to Qu'Appelle for the purpose of investigating on the spot certain disputes then pending.

Early in December, acting under instructions from the Minister, I visited the Prince Albert District to adjust certain matters requiring attention, to confer with the agricultural society regarding the seed grain which it was proposed to send there, and to report on certain allegations which had been made respecting the causes of the late half-breed and Indian outbreak in that locality. The result of my investigation into the latter object was contained in my report, dated at Prince Albert the 14th December, 1885, which was published.

I returned to Winnipeg late in December, and in January visited Ottawa in company with yourself. It was deemed advisable to utilize my services in Ottawa until the 1st of May following, when I returned to Winnipeg, remaining there, engaged on matters requiring the decision or attention of the Land Board, until the 24th of that month, at which date I went to Calgary, thence to Fort Macleod, Pincher Creek, and the neighboring locality, my object in visiting these latter points being to ascertain in what localities squatters on unsurveyed lands had established themselves.

I then returned to Calgary, from which place I proceeded to Morley to adjust a dispute between certain parties there; thence to Banff, to investigate certain claims to the springs, which had been made on the ground of alleged discovery. Later on I joined the Hon. the Minister of the Interior and yourself, at Victoria, B.C., returning on the 11th July, visiting, *en route*, Calgary, Fort Macleod, Lethbridge, Regina and Winnipeg, the last named place being reached about 1st August.

Some two weeks afterwards I returned to Calgary, and on to Edmonton, where I remained some sixteen days, reaching Calgary again on the 14th September. On the 21st of the same month I proceeded to make an inspection of the ranching country, having in view reservations for water and shelter for stock, returning to Calgary on the 15th of October; two days later I came here, where I have remained at your request up to the present time.

I have reported through you, for the information of the Minister, upon all matters that have, from time to time, come under my notice, or in connection with which it was expected I should report.

With regard to the labors of the Land Board, such matters will doubtless receive attention in your own report, so that here it will probably be well to confine myself to those matters which have come directly under my notice.

Grazing or Rancho Country.

This interest was first instituted in the North-West in 1882, and has been steadily growing since that date. During the winter of 1882-83 very severe losses of stock occurred in the neighborhood of Calgary, chiefly confined to one herd, but as that herd comprised probably 50 per cent. of all the stock in the country at that time, the total loss amounted to a very considerable proportion of the whole, and

this industry in consequence received a severe check. However, the company which suffered the principal loss was not discouraged, and the result to-day shows the wisdom of their determination. There is no doubt their loss was caused largely by inexperience, coupled to some extent with ill-luck.

At the present time there are, within the grazing portion of our North-West, about 104,000 cattle, 11,000 horses and 25,000 sheep. This estimate will be found very close, having been obtained by a personal visit to the majority of the ranches and enquiry from the best sources as to the remainder.

Of the above, 34,000 cattle, 3,500 horses, and 7,000 sheep, came in this year, being an addition by importation over and above the natural increase.

About 26,000 cattle, 2,000 horses, and 6,500 sheep, came in from the United States. The remainder were imported from Ontario and British Columbia, the number, so far as cattle are concerned, being about equally divided; but the great majority of the horses came from British Columbia.

Eleven thousand five hundred head of horses and cattle are owned by seventy-one persons who are non-leaseholders, and about half of whom have not a homestead entry, an average of about 162 head to each. These cattle are, in the majority of cases, grazing on leased lands.

Eight hundred head of cattle and horses, included in the above enumeration, are held by thirty-two settlers—non-leaseholders—but who are already, or will as soon as possible become, homesteaders. These parties have no more stock than the land claimed by them will carry—an average of twenty-five to each settler.

There are, of course, a large number of cattle and horses owned by homesteaders in the vicinity of Calgary, not enumerated, but they are on lands open for entry, and in few or no cases has the settler more than his claim will carry.

The appointment of an inspector of ranches will, no doubt, enable the Department to obtain annually a correct enumeration of the stock—information which will prove of the greatest value to the country.

It will be noticed that there has been a very large increase in all lines during the past year. The output of wool will soon be such as to warrant the erection of factories for its manufacture, and the country is to be congratulated on the probability, in the near future, of exporting blankets and other articles of wool, in addition to that provided for home consumption.

Since the 1st September last a duty of 20 per cent. has been collected on all importations of stock. Prior to that date those holding leases were permitted to bring in all they desired free, so long as none were sold for three years after importation, and the proportion of one head of horses and cattle for ten acres, and one sheep for two acres leased, was not exceeded.

There has been considerable agitation, since the duty was imposed, towards obtaining permission for at least another year to import stock under the old conditions, and with this in view, certain leaseholders whose lands yet remain unstocked, in whole or part, have sought to obtain an expression of opinion from the North-West Council favorable thereto. That body, however, gave an adverse reply. You may have noticed in this connection that some of the Canadian press have expressed themselves as strongly opposed to the Council's decision.

On the one hand it is urged that there is plenty of territory to be covered with stock, and it is a "dog in the manger" policy to prevent this by the imposition of duties; that as Canada's market for beef (there being already a large surplus) is dependent on either that of Great Britain or the United States, all that will be added to our exports by stocking our ranch country forthwith to its full capacity, will not, to any appreciable extent, affect the price to be received; and that the stocking thereof will add wealth immediately to the country, give our railways traffic and furnish the necessity for the employment of labor, which means wealth.

On the other hand, it is urged that it would be unfair to the present leaseholders, would, in fact, to some extent, be a breach of faith, as they could dispose of any surplus breeding stock they might have for nearly the amount of duty higher than they could were such duty remitted.

Further, with the serious droughts which have occurred during the past year or two throughout the ranching sections of the United States, and the over-stocking of the same, there will, if duty be not imposed, be such a rush of stock into our territory as to incur the risk of "eating out," which has happened with our neighbors to the south. That it is preferable to "make haste slowly," and so be able best to shape our policy in the public interests.

The question is one requiring considerable attention.

It is also worthy of consideration whether or not a change in our leasing system should be made. The object of granting leases was, I presume, to prevent over-stocking—"eating out"—and at the same time obtain a revenue. At present there are a good many cattle held in the territory by non-leaseholders, and settlers who have made entry for a homestead, or at most for a homestead and pre-emption—320 acres—have, in some cases, 400 and 500 head of stock. Many others holding considerable herds have not even obtained an entry, and are as yet squatters on the public domain, chiefly on unsurveyed lands.

In addition to not paying anything for use of the public property they, in many cases, go to no expense to procure bulls or stallions, obtaining the use of these animals from the leaseholders without remunerating them in any way therefor.

Such a state of affairs has produced and is liable still further to produce considerable friction.

This matter of overstocking and of compelling all parties to bear a proper share of the cost for males can, it is urged, be regulated by the formation of a stock association, vested with large powers.

In conformity with petitions from stockmen, steps have been taken to reserve a fairly liberal amount of lands from settlement so as to give reasonable access to streams and springs for watering purposes, also bottoms and ravines for shelter. Every settler in this district is—or intends so soon as financially in a position to do so—to devote his attention to stock.

Under the conditions prevailing in our North-West ranching country, stock, or at all events cattle, must be allowed to drift wherever they desire; no one keeps his stock on his own land, and at times, probably nearly the whole time, a greater or less proportion of them are miles away from their owner's location, consequently it is as much in the interest of the large as of the small stockmen that plenty of places should be reserved for the purposes mentioned.

Irrigation.

Throughout the ranching district generally there is rather a scarcity of hay. The contract price of that article for the present winter for the Mounted Police at Macleod and Lethridge was about \$19 per ton.

The more hay that can be produced, the more stock can be wintered—though often very little is fed, yet if it could be readily and cheaply obtained a large amount could with profit be utilized, as all use some. The supply must come from irrigated lands. Would it not be advisable that some regulations should be framed to provide for irrigation? In my report of last year I mentioned this matter, and it was commented upon by the Deputy Minister.

Wolves.

During the time the buffalo abounded on the plains, the herds of these animals were followed on the plains by droves of coyotes, and in the neighborhood of the foot hills by timber wolves as well as coyotes. When the buffalo disappeared so also did the wolves, but as the country became stocked these pests have returned. They subsist on the cattle as they did on the buffalo, by killing lame or sick stock, calves, &c.; they also destroy colts.

At the session of the North-West Council in the autumn of 1885, the representatives from the ranching district attempted to pass an ordinance granting a liberal bounty for the destruction of these animals, but the members from other parts of the

country naturally objected. I might here mention that it is claimed that the law regulating the putting out of poison in the North-West Territories might be modified to advantage. In discussing this matter with Col. Macleod, he stated the present ordinance was sufficiently liberal in that respect.

I think this matter is one that should be handled by the stock associations.

Prairie Fires.

Too great care cannot be exercised in respect to prairie fires. Probably the difficulty may be met by increasing the fine to be imposed for failure in turning out to extinguish them and by defining the radius within which all are required to render assistance. On two occasions this season the benefit of organization was conspicuously demonstrated. Fires that formerly would have been thought beyond control were completely subjugated in a few hours; of course this was done at the sacrifice or permanent injury of a few horses, but this would bear but a small percentage to the loss that would have been incurred had such fires been allowed to run. As settlers in the country increase and artificial fire breaks are established where no natural ones exist, the liability to loss will rapidly decrease.

In my annual report for 1884, I alluded to what will no doubt sooner or later prove a valuable sheep country, viz., the Missouri Coteau District. Without, however, as stated in that report, the establishment of artificial firebreaks, it must remain perfectly valueless. Never an autumn passes that this district is not run over by fires. In Manitoba and portions of the North-West, as you are aware, very serious losses have been occasioned by these fires, and much suffering will doubtless ensue during the coming winter from this cause. If the practice adopted in the ranching country in the United States was also taken advantage of in these districts, probably 95 per cent. of the loss could be averted.

The practice I refer to is this: Fire guardians are appointed for every district, the area of each, where there is considerable settlement, not being large, but these guardians do not necessarily confine their duties to their respective districts. Every male within the district is enrolled, somewhat similar to the volunteer fire brigades in our small towns and villages. A certain number supply horses and waggons, with barrels of water; all the remainder who have saddle horses turn out with them and carry a sack filled to a small sized bundle with old blankets or other sacks; and those who have not horses go on foot. When a fire is seen all within ten miles (sometimes a longer limit is fixed) make as fast as they possibly can to it, the sacks are dropped into the water barrels, and when wet, it is incredible the rate at which a fire may be extinguished, particularly at night when the wind is blowing moderately, if at all; in the majority of nights the wind ceases, or blows very gently. Four men on horseback, accompanied by a team, driver, and two barrels of water have frequently put out ten miles of fire. Any person failing to turn out is subject to a fine varying from \$10 to \$100, and in default to imprisonment.

Any one who has observed prairie fires will admit that with such an organization very little danger will be incurred. It is too much the practice of settlers to neglect prairie fires, trusting to fortune that it will not come near their improvements or stock.

Cavalry Horses.

During the past season certain British cavalry officers visited Canada, and among other places took a run through our ranche country. They expressed themselves as very much pleased with its possibilities in regard to the production of a healthy and muscular horse, suitable for cavalry purposes. All that is required is the stock to breed from; nature has been extremely bountiful in supplying all the other requisites. It is not without the limits of probability that within a few years a large output of horses of this class may take place from the North-West, nor need the export of horses be confined to this class only, the race horse, trotter, carriage, roadster, general purpose and heavy draught, can equally well and as cheaply be bred. Care in the selection of dams and sires must be observed, and the present abominable

practice of branding, which so grossly disfigures, should cease. The sooner our horse-men drop their cayuse dams and procure good ones, the sooner they will be on the highway to fortune. In the past, when the country was settling up, these animals served a good purpose, but their day if not now past very soon will be.

Squatters on Unsurveyed Lands.

During the past season nearly all the unsurveyed lands on which squatters are located were surveyed, and before next spring it is anticipated the plans will be prepared and entries may be granted.

There are still some few straggling settlements, but, excepting in one locality, I know of no unsurveyed township in which there are at present three *bond fide* squatters. The majority of such townships are so rough that the survey thereof will be expensive, costing probably \$1,500, and the point to be decided is this: Would the Government be justified in incurring the expense of survey for the object sought to be attained, particularly as most of these are in the ranching districts and the squatters engaged chiefly in stock raising, which stock roam at large whether the territory be surveyed or not? Of late years settlers have been as far as possible discouraged from squatting in advance of survey.

On the other hand if the surveys were made, the topographical knowledge obtained would be of very considerable value to the country. And even in a stock country, as has been already stated, it may be advisable in the public interest to reserve for water and shelter certain lands which can only be done definitely after survey has been made.

Victoria Settlement.

This is one of the oldest settlements in the North-West. During the "boom" of 1882, a large percentage of those entitled to land there sold out their claims to a syndicate of speculators and took land further up the river. Advantage was taken of the visit of the Half-breed Commission this summer to that settlement to take the necessary evidence to dispose of these claims. This evidence is expected here shortly, when they will be disposed of without delay.

Squatters in Railway Belt, British Columbia.

The surveys branch of the Department of the Interior has been pushing its work energetically, and in an interview with the Surveyor General a few days since, I was informed that the greater portion on which there are settlers would be covered this year, and under the system adopted for future surveys they could readily be made in any locality where settlement might be tending or where in the interests of mining, lumbering or manufacturing, it should seem advisable to make them.

It is expected that during the coming winter the surveys will be sufficiently advanced to allow of a settlement of the majority of the claims of squatters in the railway belt, and within twelve months those remaining unsettled will probably be a very small percentage of the whole.

Coal Mining.

So far as the North-West Territories are concerned, very considerable progress has been made in this industry. About six weeks since the North-West Coal and Navigation Company introduced into their mine coal cutting machines—worked by compressed air. The result has been a marvellous improvement in the quality of the output, at a reduction in cost of probably 50 per cent. The seam in this mine lies horizontally, or nearly so, permitting of the working of these machines to the greatest possible advantage, the waste being not more than 25 per cent. of that done by hand mining, and the coal is so mined that any imperfections in the seam which may from time to time be discovered, can be left in the mine. Farther the coal can be all mined in pieces as large as can be readily handled, thus saving a very considerable percentage of waste which arises after the mineral leaves the "pit head"; besides

large lumps retain their quality better than small ones when exposed to atmospheric influences for any length of time.

The anthracite coal mine of Mr. McLeod Stewart and associates—situate a short distance east of Banff—is now being developed energetically. A tunnel is being driven, and active preparations for handling it made. I understand some ninety men are at work there. Several tons of this coal were mined last summer, and the result, from practical tests, was encouraging in the highest degree.

The Medicine Hat Mine is situated on Section 7, Township 13, Range 6, west 4th meridian. No work was done here for some time owing to financial difficulties. A new organization have now taken hold of it and are going to work with commendable vigor.

Major Vaughan has been occupied during the past year opening up a coal seam on Section 12, Township 25, Range 5 west 5th meridian. The quality of the mineral is improving very much as greater depth is attained.

Mr. C. W. Moberly and associates have been sinking a shaft on Section 2, Township 26, Range 4, west 5th meridian, expecting to find coal. The progress here has been considerably impeded by water and the expense greatly augmented by the pumping machinery required on this account. Some \$14,000 have it is stated been expended, and the promoters are very sanguine of success.

The North-West Coal and Navigation Company having the right to select 10,000 acres of coal lands, purpose prospecting a considerable area around Lethbridge with a diamond drill. The results will be watched with considerable interest. The opinion is expressed that it would be a good move on the part of the Government to sink diamond drill tests over several portions of the North-West. The formation of a company has also been suggested, which would prospect in the same manner, obtaining from the Government certain concessions, such as the reservation for a limited period of lands which the company would have a preferential right to acquire, should the test prove favorable or encouraging.

The probable extension of the South-Western Branch of the Canadian Pacific Railway within a short time into the Souris River coal district has directed attention to the mining possibilities in this part of the country, and within the past few days some enquiries have been made regarding them.

After a very considerable amount of experiment coupled with expenditure, in connection with the gold dredging in the Saskatchewan at Edmonton, it is thought that a dredge has been obtained which will work successfully. It is known as the Nye steam pump, and it takes up gravel and sand very effectually. The company's intention was to thoroughly prospect the bed of the stream when the water was low. The present autumn and next year will doubtless prove favorable for placing the dredge where it can work to the best advantage.

Considerable excitement has been caused over the find of gold on Discovery Creek, near Edmonton. This creek empties into the Saskatchewan River some forty or fifty miles above Edmonton. A large number of claims were taken up recently, and another season will probably demonstrate to what extent the precious metal is to be found in that vicinity.

Petroleum.

From certain indications that have been observed during the past season, it is thought that petroleum will be found in the neighborhood of Lake Dauphin, and several claims have been taken up with a view to petroleum mining. It is anticipated that during next season this locality will be thoroughly prospected.

During the past two years considerable placer mining has been carried on at the head waters of Yukon River in the North-West Territories, and during the past season it is said as many as 250 miners have been engaged in that region. Prospecting for quartz, mining for gold and silver, have been carried on with strong probabilities that such efforts would be rewarded with success. The results obtained at the now famous Bulkwell mine, a short distance to the south, should be the strongest inducement to persevere.

The doubt raised by the British Columbia Government as to the Dominion's title to the minerals within the Canadian Pacific Railway belt in that province has had a most injurious effect on the mining prospects therein.

Enough however has been ascertained to warrant the belief that an immense amount of wealth lies buried there, but it will require capital to develop it. The erection of reduction works, chiefly in the way of smelters, suitable for the ore, is the first step to be taken. These will require capital, and it is anticipated that within the very near future, owing to inducements held out by the Canadian Pacific Railway, and concessions as to sites for such works which may be offered by the Dominion Government, capitalists will soon be forthcoming to undertake the erection and working of them. Once a start is made I think there can be no doubt as to the rapid increase which will follow.

Within the past year the Government has very wisely taken the steps necessary to the creation of public reserves along the route of the Canadian Pacific Railway, to protect the magnificent scenery met with on that route through the Rocky, Selkirk and Gold Ranges of mountains.

The writer has crossed this continent on the Southern Pacific, the Central and Union Pacific, the Northern, the Denver and Rio Grande into the heart of Colorado, but the Canadian Pacific far surpasses them all, and it would be an act of national disgrace if every possible step were not taken to prevent in the slightest degree the marring of the wonderful beauties which nature has conferred on the Canadian route.

At the Banff Park there is, in addition to the scenery, the wonderful hot springs, so productive of pleasure and health giving properties. They have, however, during the past year, been brought so prominently before the public by correspondents of the press and tourists' letters, that it is unnecessary here to more than allude to them.

There are many other points in the Rocky Mountains which, in the near future, it would be well to reserve; among which may be mentioned the vicinity around those lakes which rise near the 49th parallel and empty by the Waterton River into the Belly River; also portions of the Crow's Nest Pass and approaches thereto.

It is stated that either on the head waters of the Brazeau or Red Deer Rivers—or both—many springs similar to those at Banff exist. I hope during the next summer to obtain more definite information on this head.

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

WM. PEARCE,
Superintendent of Mines.

H. H. SMITH, Esq.,
Commissioner of Dominion Lands,
Winnipeg.

No. 3.

OFFICE OF THE DOMINION LANDS COMMISSION,

WINNIPEG, 31st October, 1886.

SIR,—I have the honor to submit, through you, for the information of the Honorable the Minister of the Interior, the following report on the general work of my office during the Departmental year ended this day:—

In the latter part of October, 1885, I went to Edmonton and made inspections of the Dominion Lands and Crown Timber Offices at that point, as well as attending to some other matters relating to settlers' claims. I left Edmonton 5th November, reached Calgary on the 8th, and remained there until the 14th of the month. While in Calgary I made an inspection of the Crown Timber Office there, and partly effected the settlement of some squatters' claims in the neighborhood.

On the 16th November I arrived in Winnipeg, and on the 18th left for Deloraine, reaching there on the 19th. During that night and the following morning I made an inspection of the Turtle Mountain Agency, and returned to Winnipeg by way of Brandon.

During your absence making certain investigations at Qu'Appelle I took charge of your office in Winnipeg on the 23rd November and the following days.

On 1st December I went to Regina and inspected that agency, and in returning visited Brandon and inspected the agency there.

The offices at Birtle and Minnedosa were inspected on the 18th and 19th December respectively.

On the 25th December I went to Ottawa, and was there engaged until 8th January with matters relating to the work of the Dominion Lands Agencies and the Board.

On my return to Winnipeg I took charge of your office during your absence with Mr. Pearce in Ottawa.

Immediately on your return, about the end of January, I went to Calgary to look into some matters there requiring the attention of a member of the Board, and while there made an inspection of the Land and Timber Offices.

February 26th made an inspection of the Land Office at Brandon.

I inspected the Dominion Lands Office at Manitou on 3rd of March, and that at Deloraine on the 4th of that month.

On the 16th and two following days I made an inspection of the Land Office at Regina, and the office of the Farmers' North-West Land and Colonization Company also located at that point.

The offices at Minnedosa and Birtle were inspected by me on the 25th and 27th of March respectively.

In the month of April I took charge of your office during the time you were engaged in Ottawa, and early in May left Winnipeg to inspect the offices lying along the Canadian Pacific Railway (west) and the North Saskatchewan.

On 1st of May I examined the building and fittings of the registry office at Regina under special instructions, and on the 10th of May and three following days inspected the Dominion Lands and Crown Timber Offices at Calgary.

On the evening of the 13th May I left Calgary for Edmonton, reaching the latter place on the evening of the 18th. The journey to Edmonton was rather a rough one, owing to the wet state of the roads caused by rain and snow storms, and in many places the streams were very much swollen. On reaching the Red Deer River I made an inspection of the books of the agent of the Saskatchewan Land and Homestead Colonization Company.

During my visit to Edmonton which lasted about ten days, besides inspecting the Dominion Lands and Crown Timber Offices I was engaged in hearing evidence respecting certain charges preferred against the Crown Timber Agent, Mr. Thomas Anderson.

Late in the afternoon of the 28th May I left Edmonton for Battleford, taking what is known as the telegraph trail lying south of the North Saskatchewan. For the greater part of the distance the land is of good quality, and there is an abundance of timber and good water. I reached Battleford on the 3rd June and remained there a day to inspect the office.

On the 5th June I left Battleford for Prince Albert, following what is known as the river trail. This trail is a very good one, abundantly supplied with good water and timber. There is along the trail some excellent land, especially is this the case in the vicinity of Fort Carlton.

On the 8th, 9th and 10th of June the Dominion Lands and Crown Timber Offices at Prince Albert were inspected, and on the 11th I left Prince Albert for Fort Qu'Appelle. At this point on the 16th June I inspected the Dominion Lands Office for Touchwood District and the office of the Dominion Lands Colonization Company, and the same evening drove to Indian Head.

On the 19th June I inspected the Dominion Lands Office at Regina, and that of the Coteau District on the 21st June.

During the month of July I took charge of your office while you were absent in the North-West Territories and British Columbia with the Hon. Thomas White.

Inspections were made of the Dominion Lands Offices at Birtle and Minnedosa on the 17th and 18th August respectively.

From the 27th August to the 3rd of September I was engaged inspecting the Dominion Lands Agency at Regina and obtaining information required by the Land Board with reference to certain disputed patent certificates.

On the 3rd of September I again inspected the Dominion Lands Office at Brandon, and on the 7th and 8th of September, respectively, those at Deloraine and Manitou.

During the current month when you were absent in Ottawa I took charge of your office here.

The result of the foregoing inspections, &c., have, from time to time, formed the subject of reports for the information of the Minister.

When not occupied as above my time has been fully taken up with work pertaining to my duties as a member of the Land Board.

I am pleased to be able to state that as a general thing the work of the different agencies is in a very satisfactory state. I enclose herewith a schedule giving full information relative to the work performed in the several local offices. The schedule relates only to the business transacted at the agencies, and therefore does not include entries, &c., made with any of the agents of colonization companies.

Owing to the very full account of the condition and prospects of the settlers contained in your report, I do not deem it necessary to say anything on that head

beyond mentioning the fact that, notwithstanding the unusual dryness of the past season in some districts, a much larger area than ever before has been prepared for crop for the coming season.

I have the honor to be, Sir,

Your obedient servant,

J. M. GORDON,

Inspector of Agencies.

H. H. SMITH, Esq.,

Commissioner of Dominion Lands,

Winnipeg.

[PART I]

27

ANNUAL STATEMENT, compiled from the Reports of the several Dominion

No. of Agency.	Agency.	Letters.		Circulars.		Ordinary Home-tead Entries, 160 acres each.		Ordinary Pre-emption Entries, 160 acres each.		Homesteads.			
										Recommended for Free Patent.		Sale after 12 Months' Residence.	
		Sent.	Re-ceived.	Sent.	Re-ceived.	No.	Acreage	No.	Acreage	No.	Acreage	No.	Acreage
1	Battleford	688	514	.....	45	{ *12 3,600 29 4,598 }		20	3,062	7	1,263	.....	.....
2	Birtle.....	2,672	2,352	32	69	{ *25 8,000 203 32,480 }		45	7,200	434	69,440	2	320
3	Calgary	1,345	1,450	26	51	{ *45 7,200 258 41,280 }		159	25,440	35	4,600	.....	.....
4	Coteau	1,065	555	.....	65	{ *43 13,760 177 28,320 }		105	16,800	76	12,160	.....	.....
5	Dufferin	1,598	1,747	63	69	{ *5 1,594 13 2,089 }		1	133	249	39,744	1	320
6	Edmonton	1,001	1,172	.....	65	{ *4 1,060 66 9,882 }		23	3,130	30	4,802	.....	.....
7	Little Saskatche'n	2,033	1,542	.....	60	{ *26 7,941 137 16,587 }		24	4,789	149	23,810	.....	.....
8	Lethbridge	373	505	.....	35	{ *21 6,431 3 459 }		1	155	3	577	.....	.....
9	New Westminster.	440	926	312	18	112 17,349		.....	.....	.....	.....	.....	.....
10	Prince Albert.....	1,240	1,034	.....	65	{ *36 10,761 128 21,043 }		67	11,483	74	11,160	.....	.....
11	Qu' Appelle	6,452	5,710	.....	50	{ *46 14,720 149 23,601 }		60	9,360	479	76,640	.....	.....
12	Souris.....	3,580	3,949	...	56	{ *38 11,680 160 25,690 }		56	8,960	687	109,920	.....	.....
13	Swift Current.....	300	196	5	28	3 470		1	68	.....	.....	.....	.....
14	Touchwood	572	240	.....	35	{ *2 640 2 320 }		2	320	26	4,160	.....	.....
15	Turtle Mountain..	2,351	2,013	.....	50	{ *76 24,320 186 29,873 }		121	19,417	383	61,397	11	3,204
16	Winnipeg.....	2,243	2,038	500	23	87 12,961		17	2,051	187	29,736	.....	.....
	Totals.....	27,953	25,943	938	784	2,092 378,619		702	112,368	2,819	449,409	14	3,844

*Military Bounty Warrants.

[PART I]

Lands Agencies, for the Year ending the 31st day of October, A.D. 1886.

Second Entries.		Sales.				Lands Cancelled.				Head Office Returns.		Hay Permits.
		Pre-emptions.		Other.		Homesteads.		Pre-emptions.				
No.	Acreage	No.	Acreage	No.	Acreage	No.	Acreage	No.	Acreage	No.	Amount.	No.
											\$ cts.	
2	320	1	142	{ 73 Town sites Scrip. 14 480 1,728 }		.....	.....	.....	.....	38	8,150 68	70
75	12,000	{ M.B.W. 30 13 }	{ 4,800 2,080 }	{ 9 Scrip. }	3,226	97	15,520	64	10,200	35	25,691 39	35
3	705	3	480	Scrip.	1,680	13	2,080	5	800	56	49,871 39	8
104	28,000	3	480	.....	.....	22	3,520	22	3,520	42	6,454 93	.....
16	3,072	62	9,899	1	320	77	9,382	55	7,450	51	35,007 17	28
2	482	18	2,460	{ Scrip. 39 7,714 6,633 }		2	320	2	320	58	8,411 13	40
20	3,199	44	6,938	{ M.B.W. 2 2 }	{ 320 780 }	70	10,720	57	9,200	40	13,795 02	23
.....	.....	.....	.....	{ 17 Town sites 10 2,571 }		2	320	.....	.....	9	20,769 42	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	1,120 00	.....
15	4,243	60	9,442	{ Scrip. 20 3,663 3,800 }		12	1,760	7	960	49	9,941 16	75
79	15,900	35	5,337	24	5,371	255	40,800	190	30,400	55	23,060 84	223
103	16,480	{ M.B.W. 6 137 }	{ 32,880 }	24	4,510	265	48,400	124	19,840	49	73,234 95	35
.....	.....	.....	.....	.....	.....	3	480	1	160	5	100 00	.....
4	640	.....	.....	Scrip.	240	1	160	1	160	5	97 00	3
84	23,520	{ M.B.W. 2 89 }	{ 320 14,170 }	{ 2 }	341	110	17,600	81	12,960	46	46,013 43	.....
4	560	{ M.B.W. 3 15 }	{ 475 2,385 }	{ 30 }	3,374	104	16,590	28	4,480	62	17,458 72	79
511	109,101	491	82,288	267	46,751	1,033	167,652	637	100,450	613	339,177 23	621

ANNUAL STATEMENT, compiled from the Reports of

No. of Agency.	Entries for Cancelled Lands.								No. of Entries made through an Agent	Wood Lots.					
	Homestead Entries, 160 acres each.		Pre-emption Entries, 160 acres each.		Homestead Entries, 80 acres each.		Pre-emption Entries, 80 acres each.				Homestead Entry Fees.	Pre-emption Entry Fees.	Fees charged for cost of Cancellation.	Improvements to go to the Government	Office, Mining and other such Fees.
	No.	Acreage	No.	Acreage	No.	Acreage	No.	Acreage							
1	.....	.....	.....	.....	.....	.....	.....	.....	1	...	\$ cts. 310 00	\$ cts. 210 00	\$ cts.	\$ cts.	\$ cts.
2	40	6,400	27	4,320	14	1,120	14	1,120	32	...	2,150 00	580 00	460 00	48 50	... ..
3	11	1,760	5	800	1	80	1	80	18	...	2,580 00	1,590 00	70 00	54 00	100 75
4	21	3,360	15	2,400	2	160	2	160	11	...	2,000 00	1,220 00	410 00	65 00	.....
5	32	5,132	14	2,249	27	2,161	27	2,161	.....	10	710 00	420 00	360 00	137 00	19 35
6	1	160	1	160	.....	.....	.....	.....	.....	...	640 00	250 00	.....	.....	70 00
7	5	800	5	800	18	1,440	18	1,440	2	2	1,410 00	470 00	330 00	86 00	0 50
8	.....	.....	.....	.....	.....	.....	.....	.....	5	...	30 00	10 00	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	1,120 00	.....	.....	.....	.....
10	10	1,602	5	794	1	80	1	80	2	...	1,410 00	730 00	150 00	36 00	3 00
11	87	16,480	53	8,947	18	1,440	19	1,520	48	...	2,380 00	1,300 00	830 00	227 00	4 50
12	107	17,120	62	9,920	80	6,400	78	6,240	4	...	3,120 00	1,620 00	1,300 00	452 30	.....
13	2	320	1	160	.....	.....	.....	.....	1	...	50 00	20 00	30 00	.....	.....
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	40 00	40 00	.....	.....	.....
15	112	18,023	96	15,280	52	4,160	52	4,213	9	...	3,450 00	2,640 00	1,680 00	157 50	.....
16	80	12,677	23	3,617	3	240	3	240	3	4	1,270 00	180 00	940 00	101 25	175 15
	508	83,834	307	49,447	216	17,781	215	17,254	136	16	22,670 00	11,280 00	6,560 00	1,364 55	373 25

the several Dominion Lands Agencies, &c.—*Concluded.*

Receipts.							Expenditure.				
Sales.		Hay Permit Fees.	Fees charged for inter-change of Permits.	Entries for Cancelled Lands.		Wood Lots.	Total Receipts.	Salaries.	Travelling Expenses.	Contingencies.	Total Expenses.
Pre-emption ^s .	Other.			Amount paid and payable for Pre-emption ^s over \$2.50 per acre.							
				Paid.	Payable.						
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
..... {	*5,090 27 2,374 51	165 90	.....	.....	.....	.....	8,150 68	1,176 00	.....	333 87	1,509 87
18,346 50	3,541 29	125 10	80 00	360 00	330 00	.....	25,691 39	1,930 00	.....	363 89	2,293 89
820 00	44,616 14	20 50	20 00	.....	.....	.....	49,871 39	3,207 50	.....	1120 00	4,327 50
962 90	1,787 03	.....	10 00	.....	.....	.....	6,454 93	2,295 00	.....	398 16	2,693 16
15,132 17	17,510 32	45 10	40 00	416 55	.....	216 68	35,007 17	2,295 00	5 10	307 62	2,607 72
2,755 50	4,616 63	79 00	.....	.....	.....	.....	8,411 13	1,900 00	3 00	357 36	2,260 36
9,841 90	1,532 42	34 20	10 00	40 00	.....	40 00	13,795 02	1,960 75	.....	209 15	2,169 90
.....	20,679 42	50 00	.....	.....	.....	.....	20,769 42	392 00	21 95	325 46	739 41
.....	.....	.....	.....	.....	.....	.....	1,120 00	8,520 00	86 30	98 77	8,705 07
1,887 42	5,544 49	180 25	.....	.....	.....	.....	9,941 16	2,213 00	.....	484 79	2,697 79
9,134 88	7,972 89	358 30	100 00	753 27	.....	.....	23,060 84	4,107 00	18 45	876 22	5,001 67
56,197 91	9,483 86	52 50	130 00	878 38	140 00	.....	73,234 95	4,798 00	.....	643 68	5,441 68
.....	.....	.....	.....	.....	.....	.....	100 00	184 00	53 05	21 40	253 45
.....	.....	17 00	.....	.....	.....	.....	97 00	276 00	.....	27 08	303 08
29,739 52	6,883 96	.....	40 00	1422 45	.....	.....	46,013 43	2,307 50	.....	268 77	2,576 27
2,035 94	12,363 18	150 70	20 00	102 50	.....	120 00	17,458 72	4,208 00	.....	242 00	4,450 00
146,854 64	143,996 41	1,278 55	450 00	3,973 15	470 00	376 68	339,177 23	41,769 75	187 85	6,078 22	48,035 82

*Town sites.

[PART I]

ABSTRACT of Contingent Expenditure of Agencies of Dominion Lands, for Year ending 31st October, 1886.

ncy.	Fuel.	Light.	Cleaning Office and Atten- dance.	Postage.	Tele- grams.	Office Fittings.	Sta- tionery.	Rent.	Expense of Inspection	—	Sun- dries.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Winnipeg	48 05	13 20	103 00	99 30	...	1 50	4 50	...	...	...	33 70	242 00
Dufferin .....	...	4 00	6 00	86 00	...	4 05	...	...	...	...	6 35	163 65
Little Saskatchewan	82 48	9 00	55 00	112 50	2 80	34 78	10 55	...	...	...	2 90	115 81
Birtle	148 65	12 35	76 00	299 11	14 48	56 50	6 00	...	15 50	...	11 45	304 89
Souris	52 12	3 65	5 75	151 35	...	24 95	2 10	...	7 65	...	15 09	643 68
Turtle Mountain	97 50	6 75	24 00	64 14	...	15 00	...	...	...	...	21 20	268 77
Coleau	261 28	2 95	85 00	337 84	88 15	65 85	...	...	...	...	10 70	218 09
Qu Appelle	107 00	11 90	80 00	69 00	20 69	110 25	9 80	...	...	...	36 01	887 48
Prince Albert	6 50	3 20	...	7 50	...	...	...	...	...	...	...	417 14
Swift Current (open about 4 months) .....	...	...	0 50	10 00	2 10	...	1 85	...	...	...	...	19 25
Touchwood	110 75	25 03	24 00	46 00	...	106 20	8 67	...	...	...	12 63	27 08
Battleford	96 88	6 00	88 00	89 93	...	31 50	...	...	...	...	13 90	372 52
Edmonton	122 73	14 70	27 00	128 40	83 70	57 75	...	...	...	...	8 75	355 11
Calgary	2 25	...	12 00	31 20	15 80	110 50	11 36	10 00	...	...	116 10	595 38
Lethbridge (open 4 months) .....	...	...	...	...	3 00	...	57 87	48 00	...	...	73 00	325 46
New Westminster (open 3 months)	1,126 17	112 70	586 25	1,627 58	210 72	630 06	136 25	78 00	73 30	...	21 65	167 07
									96 45	125 20	393 98	6,123 36
<i>Crown Timber Agencies.</i>												
Winnipeg .....	...	...	5 00	133 35	24 00	4 50	...	...	1,867 34	Com- missions on Collections and Seizures.	\$18 95	2,358 80
Prince Albert	22 50	9 25	17 00	12 50	...	...	...	...	313 50	248 56	57 10	387 25
Edmonton	15 00	...	14 00	10 99	3 30	81 00	...	...	44 75	...	12 50	188 29
Calgary	85 00	...	6 00	19 33	...	48 00	...	...	9 10	15 22	18 59	201 24
	122 50	9 25	42 00	176 17	27 30	133 50	...	...	2,234 69	267 78	122 39	3,135 58

* Temporary office assistance. † Removal of office. ‡ Express on remittances. § Maps and plans.

No. 4.

TIMBER, MINERAL AND GRAZING LANDS.

DEPARTMENT OF THE INTERIOR,

OTTAWA, 15th January, 1887.

SIR,—I have the honor to submit the seventh annual report of the Timber, Mineral and Grazing Lands Office of the Department of the Interior.

Statements showing the revenue, amounting to \$121,077.85, derived from Crown timber, mineral and grazing lands, but exclusive of sales, for the departmental year ending 31st of October last, are appended hereto, together with the reports of the Crown Timber Agents at Winnipeg, Edmonton, Calgary, Prince Albert, and New Westminster, British Columbia. This amount includes \$1,251.91 dues on timber cut on school lands.

The revenue exceeds that of last year by \$35,975.69, being an increase for timber of \$8,499.77, for grazing lands, \$26,994.27, and for mining lands, &c., \$481.65.

For the sake of reference and comparison I have prepared statements showing, both by fiscal and departmental years, the revenue received for timber, mines and grazing lands from 1872 up to the 31st of October last, which statements will be found at the end of this report.

The total amount of dues collected for timber within the Winnipeg Agency amounts to \$41,669.42, being a decrease of \$2,238.40 as compared with the previous year. The agent, Mr. E. F. Stephenson, in his report, points out that the revenue would have been considerably larger but for the refusal of the Government to accept rent of timber limits granted in the "Disputed Territory"; the only revenue now collected from that quarter being from mill men who were granted leases prior to the award of the Boundary Commission. He gives a very encouraging account of the healthy condition of the lumber market, and states that the building of the Winnipeg and Hudson Bay Railway to Lake Manitoba will give access to a well timbered country on the shores and islands of Lake Winnipegosis, and that the extension of the Manitoba and South-Western Colonization Railway and the Manitoba and North-Western Railway has been a great boon to the settlers living in proximity thereto, giving them many advantages, none being of more importance than the procuring of lumber, which they can now obtain at moderate prices. He further says that the amendments to the permit regulations in March last have been well received by the settlers, and that the regulation granting rights to cut timber for commercial purposes by public competition only, meets with general favor. He deplores the destruction by prairie fires, during the last season, of many thousand acres of young timber, and says that the Legislatures of Manitoba and the North-West Territories recognize the importance of providing better means than now exist for enforcing the Act respecting the prevention of prairie fires.

The price of lumber within the Winnipeg Agency averages \$16 per M, and attached to the agent's report may be seen a schedule showing the prices at different places in the Province of Manitoba and the North-West Territories during the last two years.

The total amount of dues collected for timber within the Edmonton Agency is \$3,908.17, being \$595.26 less than last year; but from the tenor of the agent's report I infer a much larger revenue may be expected next year. The price of lumber at Edmonton during the year was from \$15 to \$30 per thousand feet, board measure, and at St. Albert from \$20 to \$35, according to quality. There are at present four

[PART I]

38

saw-mills in operation within this agency. The Hudson's Bay Company are erecting a mill on the Athabasca River, and the Alberta Lumber Company and the Saskatchewan Land Company, it is reported, intend erecting mills on the banks of the Red Deer River. The Hudson's Bay Company had the misfortune to lose by fire their mill at Edmonton.

The total amount of dues collected for timber within the Calgary Agency during the year amounts to \$12,027.58, being an increase of \$3,091.28 over last year. This increase is due solely to the steady improvement of the lumber trade at Calgary and Fort McLeod. There are at present five mills in operation within this agency, one in the neighborhood of Fort McLeod, one at Lethbridge, one at Cypress Hills, one at Calgary and one at Cochrane Station. There are also several portable mills. The Eau Claire and Bow River Lumber Company, licensees of timber berths on the Bow and Kananaskis Rivers, have nearly completed a large saw-mill at Calgary, and will commence manufacturing lumber in a few days, and Major Walker of Calgary is also erecting a mill of considerable size at Kananaskis.

The returns from mill owners show that lumber sold at Calgary from \$15 to \$20 per thousand feet; at Cochrane, from \$25 to \$36; at Fort McLeod, \$30 to \$37; at Lethbridge \$25; and at Cypress Hills \$10 to \$15.

The total amount of dues collected for timber within the Prince Albert Agency during the year is \$5,435.56, being a decrease of \$388.71 from last year. Lumber sold at Prince Albert from \$30 to \$42 per thousand feet, board measure.

In the month of May last Mr. T. S. Higginson, who had been inspecting and reporting upon the timber resources of the Dominion lands in the Province of British Columbia, was appointed a Crown Timber Agent, and opened an office in New Westminster. Mr. Higginson has succeeded in collecting all dues on timber cut on Dominion lands in the said Province since these lands were ceded to the Federal Government. The returns received show 18,266,433 feet of lumber as having been manufactured, the vast proportion of which was made by the Canadian Pacific Railway Company for purposes of construction, and was therefore free of dues. The amount of dues collected up to the 31st of October, 1885, was \$555, and between that date and the 31st of October, 1886, \$9,156.66.

Saw-mill returns received at the head office show the following quantities of building material as having been manufactured and sold during the year, within the five agencies:—

	Manufactured.	Sold.
Sawn lumber.....	39,521,592 feet	43,333,437 feet
Shingles	4,746,750	5,140,916
Laths	1,725,250	1,608,850

Forty-two yearly licenses to cut timber over a total area of 2,212.78 square miles have been issued during the year. The areas leased in the Province of Manitoba and the three provisional districts, are as follows:—

	Sq. Miles.
Manitoba.....	702.45
Alberta	1,195.99
Assiniboia	17.50
Saskatchewan	296.84

In addition to the 2,212.78 square miles in Manitoba and the North-West Territories under yearly license, an area of 791 square miles is covered by twenty-one years' leases, which were issued prior to December, 1883.

The number of applications received during the year for licenses to cut timber was 164, of which 95 were for licenses to cut timber in Manitoba and the North-West Territories, and the remainder for licenses to cut timber upon Dominion lands in British Columbia. The number of applications during the previous year was 195.

The regulations governing the granting of yearly licenses to cut timber in Manitoba and the North-West Territories, approved by His Excellency the Governor

General in Council on the 8th of March, 1883, as amended by Orders in Council passed since that date, are attached to this report. These regulations also govern the disposal of timber on Dominion lands in the Province of British Columbia as far west as the 120th degree of longitude.

In the spring of 1885 the Government discontinued granting timber limits within the territory covered by the regulations in question, except by public competition.

By an Order in Council dated the 16th of September, 1886, no penalties are to be inflicted upon the following classes of persons for cutting timber upon undisposed of Dominion lands west of the summit of the Rocky Mountains:—

Free miners engaged in prospecting or mining; travellers; persons engaged in merely scientific pursuits or exploring; farmers cutting timber for purposes connected with their farms; proprietors of mines containing coal and other minerals, cutting timber for colliery purposes; persons cutting cordwood for fuel for their own use, or for the use of steamers, or for school purposes.

The public have been invited to tender for either licenses or permits to cut timber upon 31 berths in the Province of Manitoba, 5 berths in the District of Alberta, 5 berths in the District of Saskatchewan, and 9 berths on Dominion lands in the Province of British Columbia.

The regulations governing the disposal of timber on Dominion lands in the Province of British Columbia lying west of the 120th degree of longitude and north of 49°, 34' north latitude are the same as they were last year. A copy thereof accompanies this report.

Clause 5 of the regulations respecting the cutting of timber on Dominion lands lying south of 49°, 34' north latitude and west of the 121st degree of longitude was, by an Order in Council dated the 2nd of November last, amended so as to read as follows: "No timber license shall be granted for a larger area than 2,000 acres of land for each 25,000 feet board measure of lumber that the mill operated in connection therewith is capable of cutting in 12 hours, nor shall the license be granted for a longer period than four years. The license shall not be transferable and may be surrendered at any time. No person shall be entitled to more than one license at the same time. The licensee shall pay to the Minister of the Interior for the use of Her Majesty, annually during the currency of the license, the sum of \$10 for every 1,000 acres covered thereby, the first payment to be made upon the granting of the license, and thereafter annually. In default of payment the license shall be void."

A copy of these regulations, as amended, may be found at the end of this report.

The regulations of the 10th of October, 1881, for cutting timber under permit in Manitoba, Keewatin and the North West Territories, have been cancelled, and have been superseded by the regulations approved by Order of His Excellency the Governor General in Council on the 20th of March, 1886, with amendments approved by Order in Council of the 24th of May, 1886.

The new regulations differ from the old in the following particulars:—

Clause 1.—The words "building timber" substituted for the words "house logs."

Clause 2.—The word "poles" instead of "rails."

Clause 3.—"2,000 poplar fence-rails, no rail to exceed 5 inches at the butt end," in lieu of "2,000 fence-rails."

Clause 6.—This is a new provision; it provides that the dues on cordwood of dry or fallen timber, when cut by actual settlers for their own use, shall be 10 cents per cord, instead of 25 cents the dues formerly charged.

Clause 7.—To the words "Fence-posts 8 feet 6 inches long" are added the words "and not exceeding 5 inches at the small end."

Clauses 8 and 9.—"Fence rails of poplar 12 feet long and not exceeding 5 inches at the butt end \$2.00 per thousand, and rails of any other wood 2 cents each," appear in substitution for "rails 12 feet long \$2.00 per M."

Clause 10. This is a new provision made to meet the demand of homesteaders who petitioned the Department for an increase of the allowance of building timber under a free permit.

Clauses 11 and 12.—These two clauses are also new.

Clause 13.—Reduces the dues on shingles from 60 cents to 40 cents per M, the latter being based on a 10 cent *ad valorem* tax of \$4.00 per M., a fair average price.

The following paragraph has been added:—

“The permittee shall cut up the whole of the trees felled in such a way that there shall be no waste, and to prevent the spread of prairie or bush fires the refuse (*i. e.*, the tops and branches unfit either for rails or firewood) shall be piled together in a heap and not left scattered through the bush.”

MINING LANDS OTHER THAN COAL.

Returns from the Dominion Lands Agents show that during the year twenty-seven applications were made for mining locations other than coal.

The revenue from mining lands for the year was \$3,790 made up as follows:—

Fees for entry and registration of assignments \$190; and \$3,600 in payment of mining locations at Storm Mountain, about four miles south of Silver City on the line of the Canadian Pacific Railway, and one location on Discovery Creek, a tributary of the North Saskatchewan River, about fifty miles above Edmonton.

COAL MINING LANDS.

The number of applications received during the year was forty-four, and eleven of the applicants have been given the privilege to purchase within a specified time the locations for which they applied.

The revenue for the year derived from the sale of coal lands was \$38,408.16, being an increase over the previous year of \$35,581.50. The prospects are that the revenue from this source will not be increased during the present year.

The Crown Timber Agent at Winnipeg reports that native coal is selling at Winnipeg for \$6.25 to \$6.75 per ton. The Saskatchewan Coal Company have leased their mine at Medicine Hat to a firm in Winnipeg, who are now working the mine energetically. The North-Western Coal and Navigation Company at Lethbridge are mining about 300 tons of coal per day, and the Canadian Anthracite Coal Mining Company, whose mines are near Banff on the line of the Canadian Pacific Railway, have commenced operations and expect shortly to be able to lay down hard coal at Winnipeg for about \$8.25 per ton, being \$2.00 less than the price charged for American hard coal.

Besides the above mentioned mines there are a number of others being worked by settlers in different parts of the North-West.

The coal regulations are to be found at the end of this report. By Order in Council dated the 13th of April, 1886, the coal lands withdrawn from ordinary sale and from settlement, and declared to be coal districts by Order in Council of the 26th December, 1882, as amended by Orders in Council of the 2nd March, 1883, and 26th March, 1884, were opened for settlement, reserving, however, the coal mining right therein. By Order in Council of the 14th of June, 1886, a coal district called the “Wood Mountain Coal District” is added to the list. With these exceptions the regulations are the same as those that appeared in the report of 1885.

GRAZING LANDS.

The number of leases of grazing lands in the North-West Territories issued by this Department is 126. Some of these leases have been cancelled and others returned to the Department by the lessees. The number of leases now in force is 101, covering an area of 3,793,792 acres.

The lands leased are situated principally in the District of Alberta and the southern portion of Assiniboia, with a few tracts in the Province of Manitoba.

The number of applications received for leases of grazing lands during the year was 261, being 148 in excess of the previous year.

The amount received for rent of grazing lands was \$47,337.01 as compared with \$20,342.74 for the year ending 31st October, 1885. By an Order in Council of the

1st of March, 1886, the rental of grazing lands was raised from \$10 to \$20 per 1,000 acres. A copy of the regulations is at the end of this report.

The following schedule shows the names of the lessees of grazing lands, the numbers of their ranches, and the area covered by their leases:—

No. of Ranche.	Name of Lessee.	Area in Acres	No. of Ranche.	Name of Lessee.	Area in Acres.
1	Mount Head Rancho Co.....	44,000	100	Alfred Lynch Staunton.....	8,000
2	North-West Cattle Co.....	59,000	101	Alberta Rancho Co.....	27,750
3	Ryan & Whitney.....	3,000	104	W. Bell Irving.....	5,280
6	Durham Rancho Co.....	33,000	107	Thos. B. H. Cochrane.....	51,000
11	Alexander Begg.....	1,440	108	D. McDougall.....	6,000
15	Sir F. W. de Winton and A. J. Williams.....	15,000	109	S. E. St. Onge Chapleau.....	100,000
16	Vowell & Eberts.....	29,000	111	J. Walter Ings.....	1,920
16a	D. McEachran.....	30,000	114	Thorpe & Bedelle.....	24,000
22	Stewart Rancho Co.....	23,000	119	North-West Land and Grazing Co.	24,500
25	Cochrane Rancho Co.....	73,000	120	M. Oxart.....	11,000
26	do.....	60,000	122	George Alexander.....	44,000
28	Jones, Inderwick & McCaul.....	100,000	123	Walter C. Skrine.....	8,200
30	Orrin F. Main.....	32,000	124	B. M. Godsall.....	3,600
31	Military Colonization Co.....	70,000	129	Rev. John McDougall.....	7,680
33	G. F. Wachter.....	7,000	130	Union Ranching Co.....	100,000
34	Cochrane Rancho Co.....	33,000	131	Hand-in-Hand Ranching Co.....	100,000
35	North-West Cattle Co.....	55,000	132	J. Ick Evans.....	66,000
35a	Moore & Martin.....	33,000	136	A. J. McKay.....	38,000
36	O. W. Martin.....	59,270	137	Brown Rancho Co.....	33,500
37	Halifax Rancho Co.....	100,000	140	E. Meek.....	88,000
38	Allfrey & Brooke.....	10,000	142	Thomas McKay.....	50,000
40	Jacob Erratt.....	5,000	143	T. P. McHugh & Co.....	9,700
42	British American Rancho Co.....	100,000	144	T. H. Logan.....	100,000
43	do.....	31,000	145	Geo. Scheetz.....	100,000
44	do.....	55,000	147	E. Hausman.....	100,000
45	Mount Royal Rancho Co.....	12,000	148	H. M. Taylor.....	100,000
46	Francis White.....	12,780	149	P. Doyle.....	69,000
48	New Oxley (Canada) Rancho Co...	80,000	150	Potter and Petapiece.....	5,100
55	Winder Rancho Co.....	50,000	151	F. W. Craig.....	11,000
56	Bell Bros.....	5,000	152	John J. Sullivan.....	23,000
57	Ives & Sharp.....	5,000	154	D. McEachran.....	16,640
59	New Oxley (Canada) Rancho Co...	100,000	157	Allen R. Macdonell.....	20,800
60	John Hollies.....	29,000	161	Lafferty & Martin.....	7,000
62	Brunskill & Geddes.....	13,000	163	Ingram & Chambers.....	1,280
64	Moore & Macdowall.....	22,000	165	A. C. McKay.....	76,000
65	Bell & Patterson.....	6,000	167	Glengarry Rancho Co.....	52,320
66	Michael Gallagher.....	2,600	180	John H. Conrad.....	89,300
66a	Wm. Julius Hyde.....	3,900	183	Samuel Spencer.....	22,000
67	E. H. Maunsell.....	4,480	185	Herbert Samson.....	40,000
74	Sir John Walrond.....	100,000	186	T. C. Power & Bro.....	24,500
77	New Oxley (Canada) Rancho Co...	100,000	189	Greeley & Wood.....	21,910
80	Viscount Boyle.....	5,000	197	Walter C. Skrine.....	8,700
82	Walrond Rancho Co.....	100,000	201	A. Adsit.....	1,920
87	W. S. Lee.....	25,000	208	Allan P. Patrick.....	5,120
92	W. G. Conrad.....	100,000	209	Lt.-Col. Irwin.....	33,000
93	Garnett Bros.....	20,000	217	W. Carter.....	100,000
94	F. W. Godsall.....	20,000	219	C. W. Saunders.....	3,040
95	David E. Akers.....	5,000	227	W. L. Nicol.....	4,000
96	W. F. N. Scobie.....	12,000	233	G. W. Quick.....	5,972
99	Joseph McFarland.....	13,000	240	W. G. Conrad.....	32,580
			245	Curry Bros.....	11,000
				Total.....	3,793,792

The following statement shows the total number of cattle, horses, &c., in the Districts of Alberta and Assiniboia, as reported by the lessees of ranches up to the 31st of December last.

Cattle.....	74,999
Horses.....	6,318
Sheep.....	16,431
Pigs.....	52
Poultry.....	679

Some of the lessees who, as the Department is aware, have cattle upon their leaseholds, have not yet sent in returns, and there are a number of ranchers in Alberta who have herds of cattle and who do not hold leases from the Government, so that the numbers above shown cannot be said to be the full amount of stock in the said districts. Mr. William Pearce, who during the last season made inspection of the grazing lands in Alberta with a view of ascertaining what lands should be reserved for approaches to watering places, estimates that there are over 100,000 head of cattle in the said district.

The following is a statement of the correspondence, applications received, and returns examined:—

Number of letters sent.....	5,327
Number of pages of memoranda and schedules.....	1,224
Timber—	
Number of timber berths applied for.....	164
Number of Orders in Council authorizing issue of licenses to cut timber.....	15
Number of licenses for timber berths drawn up.....	41
Number of returns from saw-mills received and verified....	135
Number of returns of surveys of timber berths received and examined.....	31
Number of returns of permits to cut timber received and verified.....	122
Grazing—	
Number of applications for grazing lands received.....	261
Number of Orders in Council authorizing issue of leases of grazing lands.....	117
Number of leases of grazing lands issued.....	46
Number of permits to cut hay issued by Dominion Lands Agents.....	619
Mining—	
Number of applications for coal locations received.....	44
Number of coal locations of 320 acres and less sold.....	13
Number of applications for mining locations other than coal.	43
Number of entries for mining locations given by Dominion Lands Agents.....	27
Number of mining locations other than coal sold.....	8
Number of stone quarries applied for.....	5
Number of mill sites applied for.....	2

I have the honor to be, Sir,

Your obedient servant,

G. U. RYBEEY,

Clerk of Timber, Mineral and Grazing Lands.

The Deputy of the Minister of the Interior.

STATEMENT of Receipts on account of Crown Timber, for the twelve months ending the 31st October, 1886.

Month.	Bonus.	Ground Rent.	Royalty on Sales.	Permit Fees and Dues.	Seizures, Dues and Fines for Trespass.	Miscellaneous.	Totals.
1885.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
November		1,642 80	1,945 91	750 75	284 45		4,603 91
December	178 00		125 66	503 25	357 22		1,164 13
1886.							
January		587 50	97 46	1,085 90	376 65		2,147 51
February		5,786 29	4,599 54	1,022 82	805 04		11,713 70
March		1,466 26	835 59	511 74	54 71		2,868 29
April		2,881 13	924 83	948 06	461 72		5,155 74
May	737 50	1,309 96	860 06	2,293 80	4,473 74	176 78	10,851 94
June	160 00	1,867 92	1,188 46	1,545 47	52 80	9 35	4,822 00
July	536 00	760 99	625 51	111 12	328 64		2,362 26
August			3,707 80	6,439 51	649 05	26 60	10,822 96
September	375 00	20 00	723 08	2,523 57	1,246 34	76 92	4,964 91
October	1,000 00	1,467 01	3,370 92	8,253 95	242 07	6 50	9,440 45
Totals	2,886 50	17,689 85	10,102 82	21,089 95	8,852 43	306 15	70,927 70
School Lands							1,251 91
							72,179 61

G. U. RYLEY,

Clerk of Timber, Mineral and Grazing Lands.

DEPARTMENT OF THE INTERIOR,
OTTAWA, 31st October, 1886.

[PART I]

STATEMENT of Receipts on account of Grazing, Hay and Mineral Lands, for the twelve months ending the 31st October, 1886.

Month.	Rents from Grazing Lands.		Hay Dues.	Rents and Bonuses from Coal Lands.	Mining Fees and Rents.	Royalty from Stone Quarries.	Totals.
	Cash.	Scrp.					
1885.	\$ cts.	\$ cts.	cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
November	1,077 81	.....	42 30	.....	20 00	9 86	1,149 97
December	1,418 36	.....	14 45	.....	20 00	.....	1,452 81
1886.							
January	1,950 40	.....	33 05	.....	45 00	.....	2,028 45
February	1,408 27	.....	114 00	.....	35 00	10 00	1,567 27
March	5,184 50	400 00	29 95	.....	.....	.....	5,614 45
April	6,157 68	400 00	92 40	.....	.....	.....	6,650 08
May	2,155 75	1,400 00	39 00	40 00	50 00	.....	3,684 75
June	3,871 85	931 08	214 35	.....	.....	1 92	5,019 20
July	1,226 60	7,440 00	143 10	.....	.....	.....	8,809 70
August	1,108 08	880 00	333 65	.....	.....	.....	2,321 73
September	994 42	7,322 21	67 05	.....	5 00	.....	8,388 68
October	170 00	1,840 00	*180 15	.....	15 00	6 00	2,211 15
Totals	26,723 72	20,613 29	1,303 45	40 00	190 00	27 78	48,898 24

* \$80 (scrip) is included.

G. U. RYLEY,

Clerk of Timber, Mineral and Grazing Lands.

DEPARTMENT OF THE INTERIOR,
OTTAWA, 31st October, 1886.

43 B.—STATEMENT showing Receipts on account of Timber, Grazing, Hay and Mineral Lands, commencing with the Departmental Year 1872-73, and ending the 31st October, 1886.

From 1st November to 31st October each Year.	Grazing Lands.		Timber Dues.	Hay Dues.		Rents and Bonuses, Coal Lands.	Mining Fees.	Royalty from Stone Quarried.	Totals.	Totals added from Year to Year.
	Cash.	Scrp.								
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.
1872-73.	632 05		632 05						632 05	
1873-74.	1,347 00		1,347 00						1,347 00	2,009 05
1874-75.	3,146 00		3,146 00						3,146 00	5,155 05
1875-76.	387 00		387 00						387 00	5,543 05
1876-77.	320 00		320 00						320 00	5,863 05
1877-78.	1,820 00		1,820 00						1,820 00	7,683 05
1878-79.	3,388 15		3,388 15						3,388 15	11,070 20
1879-80.	31,339 95		31,339 95						31,339 95	42,410 15
1880-81.	44,524 17		44,524 17						44,524 17	86,934 32
1881-82.	75,781 26		75,781 26						86,984 86	172,919 18
1882-83.	150,712 27		150,712 27						170,466 82	343,386 00
1883-84.	93,765 86		93,765 86						105,157 05	448,543 05
1884-85.	63,532 84		63,532 84						84,956 16	533,499 21
1885-86.	70,927 70		70,927 70						119,825 94	653,325 15
Totals.	541,655 25		541,655 25						653,325 15	

Note.—In hay dues, total \$1,920.25, \$80 is included for scrip.

REGULATIONS governing the granting of Yearly Licenses to cut timber on Dominion Lands in Manitoba, North-West Territories, and as far West as the 120th degree of longitude in the Province of British Columbia, under the provisions of section 53 of the Dominion Lands Act, 1879, approved by His Excellency the Governor General in Council on the 8th of March, 1883, as amended by Orders in Council passed since that date.

1st. The area of a timber berth to be covered by a yearly license shall not exceed fifty square miles; and not more than one berth shall be given to an individual or firm. Any departure from this rule, which special circumstances may render expedient, shall be made only with the sanction of the Governor in Council.

2nd. Licenses shall be granted under the following conditions:—

(a.) The licensee shall pay a ground rent of five dollars (\$5) per square mile.

(b.) Within a month after the date of the Order in Council granting a timber berth, the party in whose favor it is passed shall pay the rent for the year in advance, the said rent to bear interest at the rate of six per cent. per annum from that date until the same is paid.

(c.) The licensee shall pay a Royalty of 5 per cent. on the amount of the sales of all products of the berth.

(d.) All timber berths must be disposed of by public competition. Parties tendering will be required to state the sum or bonus per square mile, which they will pay in addition to the ground rent and royalty; and the limit will be awarded to the party offering the highest bonus.

(e.) The licensee shall have in operation within a year from a date to be fixed in the license, and keep in operation for at least six months of each year of his holding, a saw mill capable of cutting daily at least ten thousand feet board measure of lumber.

3rd. When a licensee has fully complied with all the above conditions, and where no portion of the timber berth is required for settlement or other public purpose, of which the Minister of the Interior is to be the judge, the license may be renewed for another year subject to such revision of the annual rental and royalty to be paid therefor as may be fixed by the Governor in Council.

4th. In unsurveyed territory the party to whom a license shall be promised, shall, before the issue of said license and before the said party shall cut any timber, cause to be made at his own expense, under the instructions of the Surveyor General, a survey of his timber berth by a duly qualified Dominion Lands Surveyor, and the plan and field notes of such survey shall be deposited on Record in the Department of the Interior.

In surveyed territory berths shall consist of Township Sections, their legal subdivisions or fractions thereof.

A. M. BURGESS,

Deputy of the Minister of the Interior.

REGULATIONS governing the disposal of Timber on Dominion Lands, situated west of the 120th degree of Longitude, and north of 49° 34' north Latitude, in the Province of British Columbia, as embodied in the Regulations for the disposal of Dominion Lands within the Railway Belt in the said Province, authorized by Order in Council of the 20th April, 1885, as amended by Order in Council of the 16th July, 1885.

40. It shall be unlawful for any person without a license in that behalf, to be granted as hereinafter mentioned, to cut, fell or carry away any trees or timber upon or from any of the Dominion lands, unless such lands are rightfully held by homestead entry under the provisions of these Regulations.

41. Every person who shall violate the provisions of the preceding section shall, for each offence, be liable to a penalty of not less than \$25 nor more than \$500, to be recovered in a summary manner, upon the complaint of any person, before any

Stipendiary Magistrate or two Justices of the Peace, and, in default of payment, by imprisonment not exceeding sixty days.

42. Any person desirous of cutting or felling and carrying away trees or timber from Dominion lands, may obtain a license to that effect upon complying with the following provisions:

(a.) He shall apply in writing to the Minister of the Interior for a license, and shall also, if the land intended to be covered by such license be not included in any surveyed township, stake out the land sought for, by placing at each angle or corner of the land a stake or post at least 4 inches square, and standing not less than 4 feet above the surface of the ground; and upon each post he shall inscribe his name, and the angle represented thereby, thus:—"A. B's, N.E. corner" (meaning north-east corner), or as the case may be: except such posts are so planted before the notice referred to in the next succeeding section is given, all the proceedings taken by the applicant shall be void; and with his application he shall forward to the Minister of the Interior a map or sketch of the land so staked out, specifying metes and bounds, and showing thereon the best information in his power respecting the same, but if the land has already been included in any general survey, then the official number of the section or sections, or part thereof, applied for shall be given.

(b.) He shall, after making the application for the license, publish for a period of thirty days, in the *British Columbia Gazette*, and in any newspaper circulating in the district in which the lands lie, notice of his application for a timber license, and shall in such notice give the best description of the land applied for, specifying metes and bounds, and such further particulars, if any, as may be required by the Minister of the Interior.

43. In the event of any adverse claim being filed with the Minister of the Interior, he may hear and decide upon the same.

44. Timber licenses shall be granted for such area and such length of time as may, from time to time, be determined by the Governor in Council; no person shall be entitled to more than one license at the same time; the licensee shall pay to the Minister of the Interior, for the use of Her Majesty, annually, during the currency of the license, the sum of \$50 therefor, the first payment to be made upon the granting of the license, and subsequent payments thereafter annually on a day to be named in the license, and in default of payment of any such sum within thirty days after the same should have been paid, the license shall be void.

45. No timber license shall be granted in respect of lands forming the site of any Indian settlement or reserve, and the Minister of the Interior may refuse to grant a license in respect of any particular land, if, in his opinion, it is deemed expedient in the public interest so to do.

46. The license may be in the form M, set forth in the schedule to these Regulations.

47. Every licensee shall keep an account in writing of the number of trees felled by him upon the land embraced within his license, and shall, at the expiration of every three months, during the currency of his license, make and furnish to the Minister of the Interior a statement in writing, verified by declaration to be made before a Justice of the Peace, showing the number of trees so felled, and shall then forthwith pay to the Crown Timber Agent, for the use of Her Majesty, in respect of each tree felled, the sum of thirty cents, except for such trees as are hereinafter excepted.

48. The licensee shall, if required, produce to the Crown Timber Agent the original account of trees and timber cut, felled or removed, upon or from the land included within his license.

49. If the licensee shall not keep an account in writing of the number of trees felled under the license, or shall not render to the Crown Timber Agent the statement in writing aforesaid, or shall wilfully make a false statement, he shall be liable to a penalty of two hundred and fifty dollars, to be recovered as aforesaid, and in default of payment, imprisonment not exceeding sixty days, and in case of conviction the license held by him may be cancelled by the Minister of the Interior.

50. The preceding section of these Regulations shall not be construed so as to inflict penalties upon miners engaged in prospecting or mining, or upon travellers, or upon persons engaged in merely scientific pursuits or exploring, or upon farmers cutting timber for purposes connected with their farms, or upon persons cutting cordwood for fuel for their own use, or for school purposes.

51. In reckoning the number of trees felled, there shall not be included small timber used for skids, levers, rafting stuff, or the like, and no dues shall be payable in respect of such small timber.

52. If any person, without authority or otherwise than is expressly permitted by these Regulations, cuts, or employs or induces any other person to cut or assist in cutting any timber on any of the Dominion lands, or removes or carries away any merchantable timber so cut from any Dominion lands, he shall not acquire any right to the timber so cut, or any claim to any remuneration for cutting, preparing the same for market or conveying the same to, or towards, market; and any timber so cut may be seized by the Crown Timber Agent, or other officer or agent of the Minister of the Interior, and shall be sold for the benefit of the Crown; and all horses, oxen, mules and live stock, or any or either of them, and the machinery, plant and material found upon any of the Dominion lands whereon timber shall have been cut without lawful authority, shall be liable to forfeiture, and may be seized by the officer aforesaid, and may be sold for the benefit of the Crown:

(a.) If any timber shall be removed or be caused to be removed by any person from Dominion lands, such person shall, in addition to the loss of his labor and disbursements, forfeit a sum of three dollars for each tree (rafting stuff excepted) which he shall remove or cause to be removed from such land, which sum shall be recovered with costs in the name of the Minister of the Interior, in any court having jurisdiction in civil matters, to the amount of the penalty.

(b.) In any proceedings under this section it shall be incumbent upon the party charged to prove his authority to cut.

53. Where timber has been cut without such authority or permission, as aforesaid, on Dominion lands, and has been made up with other timber into a crib, dam or raft, or has been in any other manner mixed up with other timber, the whole of the timber so mixed up shall be held to have been cut without authority on public lands, and shall be liable to seizure and forfeiture by the Crown Timber Agent, or other officer or agent of the Minister of the Interior, on behalf of the Crown.

54. The officer making the seizure may, in the name of the Crown, call in any assistance necessary for securing and protecting the timber seized.

55. All timber, animals or things seized under these Regulations shall be deemed to be condemned, unless the person from whom they were seized, or the owner thereof, shall, within one month from the day of the seizure, give notice in writing to the nearest Crown Timber Agent that he claims, or intends to claim, the same; failing such notice, the agent aforesaid shall report the circumstances to the Minister of the Interior, who may order the sale of the said timber by the said agent at such time and in such manner as he may think fit.

56. In all cases where the notice referred to in the last preceding section has been given, any Supreme Court judge may, upon petition, in a summary way, try and determine such seizures, and may order the delivery of the timber to the alleged owner, upon his giving security, by bond, with two good and sufficient sureties, to pay double the value, in case of condemnation:

(a.) Such bond shall be taken, in the name of the Minister of the Interior, for Her Majesty's use, and shall be delivered up to and kept by the said Minister of the Interior.

(b.) If any timber, animal or thing in respect of which a bond has been given is condemned, the value thereof shall be forthwith paid to the Minister of the Interior and the bond cancelled; otherwise the penalty shall be enforced and recovered.

57. Every person availing himself of any false statement or oath to evade the payment of any moneys payable under these Regulations, in respect of timber, shall forfeit the timber in respect of which payment of such moneys is attempted to be evaded.

58. The Minister of the Interior may, from time to time, define timber districts, and may appoint a Crown Timber Agent for each district.

59. No logs cut under any license granted under the provisions of these Regulations shall be sawn or otherwise manufactured into lumber or other material until the logs shall have been scaled and measured by the Crown Timber Agent of the district, and the sums and timber dues prescribed by these Regulations duly paid thereon.

60. All logs shall be scaled and measured by the Crown Timber Agent or person appointed by the Minister of the Interior for that purpose in the district in which such logs have been out.

61. When the saw logs have been scaled and measured, the person who did so shall make out a bill, stating therein the number of logs, the number of feet board measure contained in such logs, and the name of the owner; and the Crown Timber Agent shall enter in the books of his office a copy of such bill; another copy of the bill shall be made out and delivered to the owner or his agent, with a certificate thereto attached that it is a true and correct bill, which bill so certified shall, for the purpose of ascertaining the amount of timber dues to be paid in respect of such logs, be presumptive evidence of the facts therein contained and of the correctness of such scaling or measurement.

62. The scale and rule by which the quantity of logs shall be determined is the rule laid down and prescribed in Scribner's Lumber and Log Book, as copyrighted, in 1882, by George W. Fisher, of Rochester, New York.

63. There shall be payable and paid by the licensee to the Minister of the Interior, to and for the use of Her Majesty, the sum of seventy-five cents for each and every one thousand feet of board measure contained in such logs, and until the same shall be paid the logs shall not be removed from the land where they were cut, and a lien for such timber dues shall attach to the logs until the dues are paid, and as soon as the logs are scaled and measured, and until payment of the dues, the Crown Timber Agent may take and hold possession of the logs.

64. In scaling and measuring logs, such allowance for hollow or crooked, or otherwise defective logs, shall be made as would make them equal to good, sound, straight and merchantable logs.

65. The Minister of the Interior may cancel any timber license granted under the provisions of these Regulations, if, in his opinion, the licensee shall not, within the time prescribed by his license, continuously proceed to cut and manufacture the timber within the limits of his license.

FORM M.

Form of License.

No	Term	years.
----	------	--------

This is to certify

of _____ in the Province of British Columbia, is hereby, from this date, licensed for the term of _____ years next ensuing, to enter upon, cut, fell and remove (except as hereinafter is reserved) timber from all that tract of Dominion lands situate in the district of _____ and more particularly described as (*insert description of land*), and containing _____ acres, more or less, with right of ingress, egress and regress for _____ agents, servants and workmen for such purposes over any adjacent, vacant and unoccupied Dominion lands.

Subject, nevertheless, to the payment of the annual sum of _____ dollars on the _____ day of _____ in each year of the said term, and to the payment of all other sums, fees and timber dues prescribed by the "Regulations for

the disposal of Dominion lands within the railway belt in the Province of British Columbia, approved by Order in Council, dated 20th April, 1885," as amended by Order in Council of the 16th of July, 1885, and also subject to all other provisions of the said Act with respect to timber.

Provided always, that any and all exceptionally large trees that may be standing or growing on the said tract of land are hereby expressly reserved to the use of Her Majesty for all time, and the said hereby expressly forbidden to cut or fell any of such trees.

Dated at

A. M. BURGESS,

Deputy of the Minister of the Interior.

DEPARTMENT OF THE INTERIOR,

OTTAWA, 9th February, 1887.

REGULATIONS governing the cutting of timber on Dominion Lands within the Railway Belt in British Columbia lying south of 49° 34' north latitude and west of the 121° of longitude west of Greenwich.

1. It shall be unlawful for any person, without a license in that behalf, to be granted as hereinafter mentioned, to cut, fell, or carry away any trees or timber upon or from any Dominion lands:

2. Every person who shall violate the provisions of the preceding section shall, for each offence, be liable to a penalty of not less than five dollars nor more than five hundred dollars, to be recovered in a summary manner, upon the complaint of any person, before any Stipendiary Magistrate, or two Justices of the Peace, and, in default of payment, imprisonment not exceeding thirty days.

3. Any person desirous of cutting or felling and carrying away trees or timber from Dominion lands, may obtain a license to that effect upon complying with the following provisions:—

(a.) He shall apply in writing to the Minister of the Interior for a license, and shall also, if the land intended to be covered by such license be not included in any surveyed township, stake out the land sought for, by placing at each angle or corner of the land a stake or post at least four inches square, and standing not less than four feet above the surface of the ground; and upon each post he shall inscribe his name and the angle represented thereby, thus: "A. B.'s N. E. corner" (meaning north-east corner) or as the case may be: except such posts are so planted before the notice referred to in the next succeeding section is given, all the proceedings taken by the applicant shall be void; and with his application he shall forward to the Minister of the Interior a map or sketch of the land so staked out, specifying metes and bounds, and showing thereon the best information in his power respecting the same, but if the land has already been included in any general survey, then the official number of the section or sections, or part thereof applied for, shall be given.

(b.) He shall, after making the application for the license, publish for a period of thirty days in the *British Columbia Gazette* and in any newspaper circulating in the district in which the lands lie, notice of his application for a timber license, and shall in such notice give a description of the land applied for, specifying metes and bounds, and such further particulars, if any, as may be required by the Minister of the Interior.

4. In the event of any adverse claim being filed with the Minister of the Interior, he may hear and decide upon the same.

5. No timber license shall be granted for a larger area than two thousand acres of land for each 25,000 feet B.M. of lumber that the mill operated in connection therewith is capable of cutting in twelve hours, nor shall the license be granted for a longer period than four years. The license shall not be transferable, and may be surrendered at any time. No person shall be entitled to more than one license at

the same time. The licensee shall pay to the Minister of the Interior, for the use of Her Majesty, annually during the currency of the license, the sum of ten dollars for every 1,000 acres covered thereby, the first payment to be made upon the granting of the license, and thereafter annually. In default of payment the license shall be void.

6. No timber license shall be granted in respect of lands forming the site of any Indian settlement or reserve, and the Minister of the Interior may refuse to grant a license in respect of any particular land, if, in the opinion of the Governor General in Council, it is deemed expedient in the public interest so to do.

7. The license may be in the form A, set forth in the schedule to these Regulations.

8. Every licensee shall keep an account in writing of the number of trees felled by him upon the land embraced within his license, and shall at the expiration of every six months, during the currency of his license, make and furnish to the Minister of the Interior a statement in writing, verified by declaration to be made before a Justice of the Peace, showing the number of trees so felled, and shall then forthwith pay to the Crown Timber Agent for the use of Her Majesty, in respect of each tree felled, the sum of fifteen cents.

9. The licensee shall, if required, produce to the Crown Timber Agent the original account of trees felled.

10. If the licensee shall not keep an account in writing of the number of trees felled under the license, or shall not render to the Crown Timber Agent the statement in writing aforesaid, or shall wilfully make a false statement, he shall be liable to a penalty of not less than five dollars nor more than two hundred and fifty dollars, to be recovered as aforesaid, and, in default of payment, imprisonment not exceeding thirty days.

11. The preceding sections of these Regulations shall not be construed so as to inflict penalties upon free miners engaged in prospecting or mining, nor upon travellers, nor upon persons engaged in merely scientific pursuits or exploring, nor upon farmers cutting timber for purposes connected with their farms, nor upon proprietors of coal mines cutting timber for colliery purposes, nor upon persons cutting cordwood for fuel for their own use, or for the use of steamers, or for school purposes.

12. In reckoning the number of trees felled there shall not be included small timber used for skids, levers, rafting stuff, or the like.

13. If any person, without authority or otherwise than is permitted by these Regulations, cuts, or employs or induces any other person to cut, or assists in cutting any timber of any kind on any Dominion lands, or removes, or carries away any merchantable timber of any kind so cut from any Dominion lands, he shall not acquire any right to the timber so cut, or any claim to any remuneration for cutting, preparing the same for market, or conveying the same to or towards market, and such timber may be seized by the Crown Timber Agent, or other officer or agent of the Minister of the Interior, and shall be sold for the benefit of the Crown.

(a.) When the timber or saw-logs made has or have been removed by any such person from Dominion lands, such person shall, in addition to the loss of his labor and disbursements, forfeit a sum of one dollar for each tree (rafting stuff excepted) which he is proved to have cut, or caused to be cut or carried away, which sum shall be recoverable with costs in the name of the Minister of the Interior in any court having jurisdiction in civil matters to the amount of the penalty.

(b.) In such cases it shall be incumbent upon the party charged to prove his authority to cut.

14. Where timber has been cut without authority on Dominion lands, and has been made up with other timber into a crib, dam or raft, or in any other manner has been so mixed up as to render it impossible, or very difficult for the Agent to distinguish the timber so unlawfully cut on Dominion Lands from other timber with which it is mixed up, the whole of the timber so mixed up shall be held to have

been cut without authority on public lands, and shall be liable to seizure and forfeiture until separated by the holder satisfactorily to the officer making the seizure.

15. The officer making the seizure may, in the name of the Crown, call in any assistance necessary for securing and protecting the timber seized.

16. All timber seized under these Regulations shall be deemed to be condemned, unless the person from whom it was seized, or the owner thereof, shall, within one month from the day of seizure, give notice to the seizing officer or nearest Crown Timber Agent, that he claims, or intends to claim, the same; failing such notice, the agent aforesaid shall report the circumstances to the Minister of the Interior, who may order the sale of the said timber by the said agent after a notice of at least thirty days.

17. Any Supreme Court Judge may, upon petition, in a summary way try and determine such seizures, and may order the delivery of the timber to the alleged owner upon his giving security, by bond, with two good and sufficient sureties, to pay double the value in case of condemnation.

(a.) Such bond shall be taken in the name of the Minister of the Interior to Her Majesty's use, and shall be delivered up to and kept by the Minister of the Interior.

(b.) If such seized timber is condemned, the value thereof shall be forthwith paid to the Minister of the Interior and the bond cancelled, otherwise the penalty shall be enforced and recovered.

18. Every person availing himself of any false statement or oath to evade the payment of any moneys payable under these Regulations, in respect of timber, shall forfeit the timber in respect of which payment of such moneys is attempted to be evaded.

19. The Minister of the Interior may, from time to time, define timber districts, and may appoint a Crown Timber Agent for each district.

20. No logs shall be sawn in any mill, or otherwise manufactured into lumber, or other material, in any mill, until the logs shall have been scaled and measured, and the timber dues hereinafter mentioned paid; but the provisions of this section shall not apply to logs cut from any lands held by pre-emption or under Crown grant.

21. The logs shall be scaled and measured at the mill by the Crown Timber Agent, or person appointed by the Minister of the Interior for that purpose, for the district in which the mill is situate.

22. When the logs have been scaled and measured, the person who did so shall make out a bill, stating therein the number of logs, the number of feet board measure contained in such logs, and the name of the owner; and the Crown Timber Agent shall enter in the books of his office a copy of such bill. Another copy of the bill shall be made out and delivered to the owner or his agent, with a certificate thereto attached that it is a true and correct bill, which bill, so certified, shall, for the purpose of ascertaining the amount of timber dues to be paid in respect of such logs, be presumptive evidence of the facts therein contained and of the correctness of such scaling or measurement.

23. The scale and rule by which the quantity of logs shall be determined is the rule laid down and prescribed in Scribner's Lumber and Log Book, as copyrighted in 1882, by George W. Fisher, of Rochester, New York.

24. There shall be payable and paid by the owner of the logs to the Minister of the Interior, to and for the use of Her Majesty, the sum of twenty cents for each and every one thousand feet board measure contained in such logs, and until the same shall be paid the logs shall not be taken into the mill or removed from where they were scaled, and a lien for such timber dues shall attach to the logs until the dues are paid, and as soon as the logs are scaled and measured and until payment of the dues, the Crown Timber Agent may take and hold possession of the logs.

25. In scaling or measuring logs, such allowance for hollow or crooked or otherwise defective logs shall be made as would make them equal to good, sound, straight and merchantable logs.

26. These Regulations shall not apply to the cutting of the trees known as hemlock.

27. The Minister of the Interior may cancel any timber license granted under the provisions of these Regulations, if, in his opinion, the licensee shall not continuously proceed to cut and manufacture the timber within the limits of his license.

A. M. BURGESS,

Deputy of the Minister of the Interior.

SCHEDULE.

FORM A.

Regulations for the disposal of Dominion Lands within the Railway Belt in the Province of British Columbia, as approved by Order in Council, dated 16th July, 1885.

No.

TIMBER LICENSE.

Term

years.

THIS IS TO CERTIFY THAT
of

is hereby from this date licensed for the term of _____ years next ensuing, to enter upon, cut, fell and remove (except as hereinafter is reserved) timber from all that tract of Dominion lands situate in the district of _____, and more particularly described as (*insert description of land*), and containing _____ acres, more or less, with right of ingress, egress and regress for agents, servants and workmen for that purpose over any adjacent, vacant and unoccupied Dominion Lands.

SUBJECT NEVERTHELESS to the payment of the annual sum of _____ dollars, on the _____ day of _____

in each year of the said term and to the payment of all other sums, fees and timber dues prescribed by the "Regulations for the disposal of Dominion lands within the "Railway Belt in the Province of British Columbia, as approved by Order in Council, "dated 16th July, 1885," and also subject to all other provisions of the said Act with respect to timber.

PROVIDED ALWAYS, that any and all exceptionally large trees that may be standing or growing on the said tract of land are hereby expressly reserved to the use of Her Majesty for all time, and the said _____ hereby expressly forbidden to cut or fell any of such trees.

Dated at _____

.....
Minister of the Interior.

REGULATIONS for the cutting of timber under permit in Manitoba, Keewatin and the North-West Territories, approved by Order of His Excellency the Governor General in Council on the 20th March, 1886, with amendments approved by Order in Council of 24th May, 1886, herewith embodied.

(These Regulations supersede those of 10th October, 1881, which have been cancelled by the said Order in Council of 20th March, 1886.)

HOMESTEADER'S FREE PERMIT.

Any occupant of a homestead quarter section having no timber of his own may, upon application, obtain a permit to cut such quantity of building timber, fencing timber or fuel as he may require for use on his homestead, not exceeding the following:—

1. 1,800 lineal feet of building timber, no log to be over 12 inches at the butt end.
2. 400 roof poles.
3. 2,000 poplar fence-rails, no rail to exceed 5 inches at the butt end.
4. 30 cords dry wood.

Should the house timber be sawn at a saw mill, payment for sawing must not be made by way of toll, as the full quantity of lumber cut from the logs must be used on the permit holder's homestead.

In order that mill owners may be able to give satisfactory evidence that saw logs or lumber found in their possession have been lawfully cut, they should require from settlers bringing timber to be sawn proof that the same has not been cut on Dominion lands, or that it has been cut under a permit, which the settler should produce in order that its number, its date, and the name of the permittee may be noted by the mill owner. The latter should also record the amount of such timber sawn by him, so that he may be in a position to duly protect himself should an account or return thereof be demanded by agents of the Department.

The applicant will require to pay an office fee of 50 cents before he can obtain a permit, but no dues will be charged for the timber or wood cut under and in accordance with it.

Settlers whose farms may have thereon a supply of timber or who are in possession of wood lots or other timbered lands will not be granted a free permit.

PERMITS SUBJECT TO DUES.

Permits subject to payment of dues may be granted to those applying for them, to cut timber on available Dominion lands, on paying dues at the rate hereinafter specified:—

5. Cordwood.....	25 cents per cord.
6. do of dry or fallen timber, when cut by actual settlers for their own use.....	10 do do
7. Fence posts 8 ft. 6 in. long, and not exceeding 5 in. at the small end.....	1 do each.
8. Fence rails of poplar 12 ft. long and not exceeding 5 in. at the butt end.....	\$2 per thousand.
9. Rails of any other wood 12 ft. long and not exceeding 5 in. at the butt end.....	$\frac{1}{2}$ cent each.
10. Building logs of poplar when not exceeding 12 in. at the butt end.....	$\frac{1}{2}$ cent per lineal ft.
11. Building logs of pine, spruce, tamarac and any other wood unenumerated when not exceeding 12 in. at the butt end.....	1 cent per lineal ft.
12. Building logs of oak, elm, ash, or maple when not exceeding 12 in. at the butt end.....	$1\frac{1}{2}$ cents per lineal ft.
13. Shingles.....	40 cents per thousand.
14. Telegraph poles 22 ft. long.....	5 cents each.
do do each lineal ft. over 22 ft.....	1 cent per ft.
15. Railway ties 8 ft. long.....	3 cents each.
16. Square timber and saw logs of poplar.....	\$2 per M. ft. B. M.
17. Square timber and saw-logs of pine, cedar, spruce, tamarac, and other woods unenumerated.....	\$2.50 per M. ft. B. M.
18. Square timber and saw-logs of oak, elm, ash or maple.....	\$3 per M. ft. B. M.

Returns of board measure to be made by "Scribner's" log rule.

All other products of the forest not enumerated 10 per cent. *ad valorem*.

An office fee of 50 cents to be charged for each permit.

Issuers of permits will be instructed by the Minister of the Interior as to the limit of quantity that will be granted, also what proportion of dues shall be deposited on issue of permit, as a guarantee on the part of those obtaining the same.

Besides the dues above specified, grantees of permits may be called upon to pay such additional sum as the Minister may judge necessary to meet their proportion of any expense incurred, or that may be incurred, by the Department in making a survey or other demarcation on the ground of the limits within which such permits are to be operative.

Permits shall set forth that those obtaining them must conform to the conditions, terms and requirements specified in the same, and carefully restrict their cutting to the limits described therein, and that any breach thereof will subject the offender to all the pains and penalties in that behalf prescribed by the Dominion Lands Act.

The permittee shall cut up the whole of the trees felled, in such a way that there shall be no waste, and that to prevent the spread of prairie or bush fires, the refuse (i.e., the tops and branches unfit either for rails or firewood) shall be piled together in a heap and not left scattered through the bush.

A. M. BURGESS,

Deputy of the Minister of the Interior.

REGULATIONS for the disposal of Coal Lands in the North-West Territories, and the Province of Manitoba, approved by His Excellency the Administrator of the Government in Council, on the 26th December, 1882, (in substitution for the preceding Regulations of the 17th December, 1881,) with the amendments thereto approved by His Excellency the Governor General in Council, on the 2nd March, 1883, the 26th March and the 13th May, 1884, the 3rd December, 1885, and the 13th April and 14th June, 1886.

1st. The following districts have been set apart and declared to be Coal Districts, the same to be known as those of the Souris River, the Bow River, the Belly River, the South Saskatchewan River, the North Saskatchewan River, the Cascade, and a district at Wood Mountain and its vicinity.

These lands are withdrawn from ordinary sale; but the even-numbered sections, with the exception of Hudson's Bay Company's lands, are open for settlement, subject, however, to the reservation of the coal and other mineral rights therein.

I.—SOURIS RIVER COAL DISTRICT.

Township 1 and South halves of 2, Ranges 4, 5, and 6, West of Second Meridian.

do	1, 2, 3	do	7, 8, 9, 10	do	do
do	1, 2, 3, 4	do	11	do	do
do	1, 2, 3, 4, 5	do	12, 13	do	do
do	2, 3, 4, 5	do	14	do	do
do	3, 4, 5	do	15	do	do
do	4, 5	do	16	do	do
do	5	do	17	do	do

II.—BOW RIVER COAL DISTRICT.

Townships 19, 20, 21, Ranges 18, 19, West of Fourth Meridian.

do	20, 21, 22	do	20, 21	do	do
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III.—BELLY RIVER COAL DISTRICT.

Townships 8, 9 and 10, Range 21; those portions of Townships 8 and 9 not included in the Blood Indian Reserve, and the whole of Township 10, in Range 22; those portions of Townships 8 and 9 not included in the Blood Indian Reserve, and the whole of Township 10, in Range 23, all West of the Fourth principal Meridian.

IV.—SOUTH SASKATCHEWAN RIVER COAL DISTRICT.

Townships 11, 12, 13, Range 2, 3, 4, 5, 6, 7, 8, 9, 10, West of Fourth Meridian.

do	14, 15, 16	do	2, 3, 4, 5.	do	do
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V.—NORTH SASKATCHEWAN RIVER COAL DISTRICT.

Townships 50 and 51, and the South half of Township 52, Range 25.

do 50 and 51, Range 26.

do 50 and 51, do 27.

do 50 and 51, in the fractional portion of Range 23, all West of the Fourth principal Meridian.

Also Townships 50 and 51, Range 1,

do 50 and 51 do 2,

do 50 and 51 do 3,

do 50 do 4,

All West of the Fifth principal Meridian, in the Provisional District of Alberta.

VI.—CASCADE COAL DISTRICT.

The North-west quarter of Township 23, Range 11,

The South-west do do 26, do 11,

The North-east do do 25, do 12,

The South-east do do 26, do 12,

All west of the Fifth Principal Meridian, in the Provisional District of Alberta, but excluding therefrom that portion of the said described area which is covered by the right of way and station grounds of the Canadian Pacific Railway.

VII.—DISTRICT AT WOOD MOUNTAIN AND ITS VICINITY.

Townships 1, 2, 3, 4, 5, 6, 7, Ranges 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, West of Second Meridian.

Townships 1, 2, 3, 4, 5, 6, 7, Ranges 1, 2, 3, 4, 5, 6, 7, 8, West of Third Meridian.

2nd. The surveys of the lands within the said coal districts will be completed as soon as possible, and thereafter the lands will be periodically offered for sale by tender or public auction. The lands within the "Cascade Coal District" at an upset price of \$12.50 per acre, cash, and the lands within all other coal districts, at an upset price of \$10 per acre, cash.

(a.) Not more than three hundred and twenty acres shall be sold to one applicant.

(b.) When there is more than one applicant for the same coal location, the Minister of the Interior may invite competition between the several applicants, or offer the land for sale at public competition by tender or by auction as he may think expedient, at the upset price of coal lands in the district in which such coal location is situated.

(c.) When applications are made to purchase coal locations situated outside of the organized coal districts, the Minister of the Interior may sell the same to the applicants at the price and on the terms which would apply if the lands were within an organized coal district, and with due regard to the quality of the coal which the said lands may be found to contain.

3rd. With respect to leases which have already been granted, each lessee who has fulfilled the conditions thereof may, within two years from the date of the Order in Council authorizing his lease, convert the leasehold into freehold, by paying in cash the upset price placed by the Minister of the Interior on the lands in the coal district wherein the said leasehold is situated; but the lease shall be null and void in all cases where the conditions have not been fulfilled by the lessee, especially the conditions contained in clause 5 of the said regulations, which are as follows: "That failure to commence active operations within one year and to work the mine within two years of the commencement of the term of the lease, or to pay the ground rent or royalty, shall subject the lessee to forfeiture of the lease and resumption of the land by the Crown."

4th. In cases where the Minister of the Interior satisfies himself that companies, or persons, have expended considerable sums of money in exploring for coal within the limit of any district for which they may have applied under the Regulations of

the 17th December, 1881, the said lands may be sold to such companies or persons at the upset price fixed for lands in the coal district in which such tract may be situated.

5th. The boundaries beneath the surface of coal mining locations shall be the vertical planes or lines in which their surface boundaries lie.

6th. The rights of lessees, and of persons in favor of whom Orders in Council authorizing leases have been passed, shall not be affected by these Regulations.

A. M. BURGESS,

Deputy of the Minister of the Interior.

DEPARTMENT OF THE INTERIOR,
OTTAWA, 14th June, 1886.

REGULATIONS Governing the Disposal of Grazing Lands in Manitoba and the North-West Territories.

1. Leases of grazing lands in Manitoba and the North-West Territories may be granted for a period of not exceeding twenty-one years, and no single lease shall cover a greater area than 100,000 acres.

2. In surveyed territory the land embraced by the lease shall be described in townships and sections. In unsurveyed territory the party to whom a lease may be promised shall, before the issue of the lease, cause a survey of the tract to be made, at his own expense, by a Dominion Lands Surveyor, under instructions from the Surveyor-General, and the plan and field notes of such survey shall be deposited on record in the Department of the Interior.

3. The lessee shall pay an annual rental at the rate of \$20 for every 1,000 acres embraced by his lease, and shall within each of the three years from the date of the Order in Council granting the lease place upon the tract of land leased not less than one-third of the whole amount of the stock which he is required to place upon the said tract—namely, one head of cattle for every ten acres of land embraced by the lease, and shall during the rest of its term maintain cattle thereon in at least that proportion.

4. After placing the prescribed number of cattle upon the tract leased, the lessee may purchase land within his leasehold for a home farm and corral, paying therefor \$2 per acre in cash.

5. The whole or any part of the lands leased shall be open to homestead and pre-emption entry or to be purchased from the Government at the cash price of not less than \$2.50 per acre, upon application being made therefor, and that, as entries are granted or purchases effected, the lease shall become void in respect of the land so entered or purchased.

6. Failure to fulfil any of the conditions of his lease shall subject the lessee to the forfeiture thereof.

7. When two or more parties apply for a grazing lease of the same land tenders shall be invited, and the lease shall be granted to the party offering the highest premium therefor in addition to the rental, the said premium to be paid before the issue of the lease.

A. M. BURGESS,

Deputy of the Minister of the Interior.

DEPARTMENT OF THE INTERIOR,
OTTAWA, May, 1886.

WINNIPEG CROWN TIMBER AGENCY.

DEPARTMENT OF THE INTERIOR,
CROWN TIMBER OFFICE,
WINNIPEG, 31st October, 1886.

SIR,—I have the honor to submit my annual report of the business transacted within the Winnipeg district for the year ended 30th October, 1886, to be read in connection with which are the following attached statements, namely:—

A. Statement of revenue derived from timber dues and other sources.

B. Statement of saw-mills operated under Government license in the Province of Manitoba and in Assiniboia, as far west as the third initial meridian, and in what is known as the "Disputed Territory," together with the quantities of material manufactured, sold and on hand, by each lessee respectively.

C. General office returns, and other information respecting the work of the office.

For the year just closed, the revenue of my agency, from all sources, amounts to \$41,669.42 as against \$43,907.82 for the preceding year. The former sum would have been considerably larger but for the refusal of the Government to accept rent of timber limits granted in the "Disputed Territory," the only revenue now collected from that quarter being from those millmen who were granted leases prior to the award of the Boundary Commission.

From Schedule B you will perceive that the main sources of revenue are (1) royalty on sales of lumber, and (2) dues on timber cut under permit, which, compared with last year's receipts, show an increase, respectively, of \$2,002.17 and \$6,095 80, while under the other headings, particular bonus and ground rent, there is a falling off. This is noteworthy, as indicating a less speculative and more healthy state of business. It is also to be noted that the millmen have shown better judgment this year in gauging the requirements of the trade, not having manufactured so largely in excess of the demand as in former years.

Through the kindness of Mr. Mingaye, Collector of Customs at this port, I am able to give you a statement of lumber material imported from the United States for the years ended 31st October, 1885, and 31st October, 1886, respectively:—

	1885.	1886.
Pine lumber dressed of all kinds.....	4,447,819 ft., B.M.	1,145,692 ft., B.M.
do undressed do	1,495,422 do	305,922 do
Pine laths.....	1,499,000	30,000
do shingles.....	5,494,000	3,022,000
Oak lumber.....	200,000 ft., B.M.	123,232 ft., B.M.
Pine logs brought into the disputed territory at Rat Portage from the State of Minnesota, U.S. (free).....	350,082 cubic ft.	1,306,383 cubic ft.
Oak logs from Dakota, U.S. (free).....	305,000 ft., B.M.	None.

It will thus be seen that while there is a reduction this year in the quantity of manufactured material imported amounting to over 75 per cent., the logs brought in for manufacture at Rat Portage have largely increased. During the year 1883, upwards of 26,000,000 feet, B.M., of lumber was imported from the United States, and prior to that year, I believe I am correct in stating that fully eighty per cent. of the lumber used in Manitoba came from that quarter.

Now a different state of affairs exists, brought about very largely by the encouragement afforded manufacturers by the liberal policy of the Government, in regard to the leasing of timber lands, and the development of trade growing out of the increasing demand, aided very materially by the extension of our railway system over the country. Owing largely to the advantages thus afforded our lumbermen are able to place their products on the market at prices which shut out American competition, excepting in a few restricted lines.

The returns of the office go to show that in 1883 pine lumber sold in Winnipeg at a price averaging \$31 per M feet, B.M.; it is now selling at an average of \$16, a price very little in advance of the rates current in the older Provinces. As will be seen by reference to appended statements, the quantity of lumber sold by our lumbermen for the year just closed amounts to 21,773,069 feet, B.M., whereas only 1,451,515 feet, B.M., of lumber came in from the United States during the same period. The principal importers of logs are Messrs. Macaulay and Ryan, "The Keewatin Lumbering and Manufacturing Company (Limited)," and Messrs. Cameron & Company, the first named manufacturing exclusively from American logs.

The building of the Winnipeg and Hudson's Bay Railway to Lake Manitoba will give access to a fine timber country on the shores and islands of Lake Winnipegosis, a large portion of which was surveyed into timber berths by the Government and sold at public auction in September, 1879.

The inaccessibility, hitherto, of these timber lands, owing to the difficulties of navigating Lake Manitoba, have prevented the lessees from carrying on operations there; but so soon as facilities are afforded for getting this timber into market they will, doubtless, find it to their advantage to erect mills and proceed with the manufacture of lumber. The extension of the Manitoba and South-Western Colonization Railway and the Manitoba and North-Western Railway has been a great boon to the settlers living in proximity thereto, affording them the means of marketing their produce, and obtaining, in return, many things of which they have long stood in need, none being of more importance than lumber, which is now brought within their reach at moderate prices.

Prairie fires have been productive of great damage in my district during the past summer, killing as they did many thousands of acres of growing timber. The loss is a serious one to the settlers on the prairies adjacent to these timber lands.

The permit regulations, as amended by Order in Council dated 20th March, 1886, whereby the dues on dead timber were reduced below those hitherto charged for green timber, will aid me greatly in meeting the wishes and wants of the settlers, and at the same time protect the green timber. The Legislative bodies of Manitoba and the North-West Territories recognize the importance of providing better means than now exist for enforcing the Act respecting the prevention of prairie fires; and, as the people throughout Manitoba and the North-West seem thoroughly aroused on the subject, it is to be hoped that before next autumn definite action will have been taken to prevent a repetition of these calamitous fires.

I had occasion recently to make an inspection of timber lands on both sides of the Canadian Pacific Railway, between Winnipeg and Whitemouth, and found that considerable damage had been done to the timber by fires. The prevailing opinion of those living along the road is that these fires were largely caused by sparks from the locomotives. This seems highly probable, as, with the exception of the engines attached to the Express, wood is used as fuel, and the smoke-stacks are unprovided with the proper spark arresters.

The Departmental regulations granting rights to cut timber on Dominion lands for manufacturing purposes, only after public competition has been invited, meets with general favor, as it places all applicants on an equal footing. The amended permit regulations approved by Order in Council on the 20th March last, have been well received by the settlers in my district; and there is, generally, a willingness to comply with them.

The total number of permits issued for the year was 1,556, and the dues collected thereunder amount to \$14,476.57. For the preceding year there were 216 more

permits issued, but the dues collected only reached \$8,285.47. The much greater sum realized this year, from a lesser number of permits, may be accounted for by the fact that a large percentage of the settlers, under the Homestead Act, had exhausted their free allowance of timber, and hence had to pay dues on the timber they cut. A further reduction in the price of cordwood and native coal has taken place since I made my last report. Cordwood is now selling on the car, at Winnipeg, for \$3.50 to \$4.50 per cord; and native coal from \$6.25 to \$6.75 per ton. The output from the several coal mines will be considerably larger this season than that of any previous season. The Saskatchewan Coal Company, whose affairs have been in the hands of a liquidator for the last two years, have leased their mine at Medicine Hat for a term of five years to Messrs. Moore & Hunter, of this city, who promise to prosecute the working of the mine energetically.

The North-Western Coal and Navigation Company's mine at Lethbridge is putting out about 300 tons per day, giving employment to upwards of one hundred miners.

The anthracite coal mine near Banff, on the line of the Canadian Pacific Railway, owned by the Canadian Anthracite Company, expect to have their coal on the Winnipeg market very shortly. I was informed by one of the directors of the company that it was expected they would be able to lay down coal at this point for \$3.25 per ton, being \$2 less than the price charged for American hard coal. Besides the above mentioned mines, others are being operated in a small way in different parts of the North-West Territories by settlers for local use.

In conclusion, it gives me much pleasure to testify to the ability of the officers attached to my staff, in the discharge of their several duties. Those devolving upon the forest rangers in protecting the timber on Government lands bring them into contact with the settlers, oftentimes under circumstances not favorable to produce good feeling; but, by their discreet conduct, they have avoided unnecessary friction. They have also uniformly exercised care in avoiding needless expense while making inspection of the various timber lands under their charge.

I have the honor to be, Sir,

Your obedient servant,

E. F. STEPHENSON,

Crown Timber Agent.

A. M. BURGESS, Esq.,

Deputy of the Minister of the Interior,
Ottawa.

SCHEDULE A.

STATEMENT of Receipts on account of Crown Timber, for the Year ending 31st October, 1886.

Month.	Royalty on Returns of Sale.	Bonus and Ground Rent.	Permits.	Seizures, Dues and Fines for Trespass.	School Lands.	Stone Quarries.	Refunded Dis- bursements.	Total.	Amounts Collected at Head Office.	Grand Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1886.										
November	1,328 07	510 19	734 25	159 45	19 25	9 86		2,761 07		2,761 07
December	71 53		379 75	284 61	3 00			738 89	178 00	916 89
1886.										
January	97 48	200 00	687 55	114 30	43 75			1,148 08		1,148 08
February	2,089 80	2,409 87	682 90	106 50	43 25			5,311 32		5,311 32
March	640 31	1,466 25	396 07	54 71	18 25			2,575 59		2,575 59
April	865 33		843 04	376 22				2,084 59		2,084 59
May	860 06	10 00	584 84	3,595 48				5,227 16		5,227 16
June	526 30		919 34	39 80	13 00	1 92		1,509 71		1,509 71
July	250 27	285 99	96 50	248 94				881 70		881 70
August	3,707 80		5,631 24	121 73			36 60	9,497 37		9,497 37
September	631 58		1,197 50	59 24			76 92	1,665 24		1,665 24
October	3,287 05	707 01	2,348 29	262 07	23 80		6 50	6,634 72	1,256 00	7,790 72
Totals	14,355 56	5,589 31	14,381 27	5,423 05	163 30	11 78	306 15	40,235 43	1,434 00	41,669 42
Collections at Head Office.		1,428 00				6 00				
Totals		7,017 31				17 78				

E. F. STEPHENSON,
Crown Timber Agent.CROWN TIMBER OFFICE,
WINNIPEG, 31st October, 1886.

SCHEDULE "B" showing the Number of Saw Mills in the Province of Manitoba and the Districts of Keewatin and Assiniboia, under Government License, for the Year ending 31st October, 1886.

Name of Owner or Owner and Assignee.	Where Situated.	Kind of Power.	Horse Power.	Capacity per 12 hours. Feet.	Commenced Operations.	Description of Timber.	Location of Limits.	Quantity of Lumber manufactured during Year ending 31st October, 1886.	Quantity of Lumber sold from amount on hand 31st October, 1885, and manufactur- ed to 31st October, 1886.	Quantity of Lumber on hand 31st October, 1886.	Quantity of Shingles manufactured during Year ending 31st Octo- ber, 1886.	Quantity of Shingles sold from amount on hand 31st October, 1885, and manufactur- ed to 31st October, 1886.	Quantity of Shingles on hand 31st October, 1886.	Quantity of Lath manu- factured during Year ending 31st October, 1886.	Quantity of Lath sold from amount on hand 31st October, 1885, and manufactured to 31st October, 1886.	Quantity of Lath on hand 31st October, 1886.	Remarks.
1 Adams & Schnider.....	Winnipeg River	Water...	62	15,000	1873	Spruce	Limit "O," Winnipeg River										Mill not worked, season 1886, account of low water.
2 Armitage & McCulloch	Minnedosa	Steam...	25	6,000	1880	do	Townships 19 and 20, Range 20, W. of 1st										No timber cut, season 1886.
Boulton, O. A.	Shell River	do	16	3,000	1883	do and poplar	Shell River	100,000									Limits abandoned.
Boyd & Crowe	Fisher River	do	75	40,000	1880	do	Fisher River	946,259							93,500		Mill not worked, season 1886, account of low water.
Brouse, George I. & Co.	Bad Throat River.....	Water...	20	7,000	1879	do and jack pine..	Bad Throat River	58,212	17,200		420,000		420,000				
Brown, Rutherford & Nielson.	Fisher Bay	Steam...	30	10,000	1880	do	Fisher Bay, Lake Winnipeg	1,000,000	800,000	1,150,000							
Bulmer, F. T., & Co.	Keewatin	do	80	50,000	1884	Red and white pine.	Crow Lake, Lake of the Woods	2,837,369	2,837,369								Mill not operated, season 1886.
Cameron, Alexander.	Minnedosa	do	25	6,000	1878	Spruce	Riding Mountain	61,374	24,293								Logs cut, winter 1885-86, hung up in stream.
Dick & Banning	Hole River	do	23	6,000	1879	do	Hole River, Lake Winnipeg	916,207	190,057								Limit abandoned; mill removed.
do	Keewatin	Water...	100	60,000	1881	Red and white pine.	Lake of the Woods and Rainy Lake	1,437,975	1,087,400	2,192,787	400,000	616,500	400,000	375,000	694,000	375,000	
3 Federal Bank of Canada.....	Ebb and Flow Lake	Steam...	75	30,000	1883	Spruce	Ebb and Flow and Moose Creek, Lake Winnipeg..	704,610	274,840	530,770					10,000		Mill destroyed by fire, May, 1886.
Hudson Bay Co.	Riding Mountain House	do	16	3,000	1880	do	Riding Mountain	55,332	110,415	72,878	71,000	55,500					Mill not worked, season 1886.
Imperial Bank of Canada.	Rapid City	do	20	4,000	1879	do	do	152,000	291,035	109,198	185,000	150,250	60,750	34,000	100	63,900	
Jermyn & Bolton	Minnedosa	do	50	15,000	1880	do	do	368,017	286,536	81,481	605,750	205,750	400,000	33,650	21,650		
Jonasson, Str	Bad Throat River	do	40	12,000	1881	do and jack pine..	Mouth of Bad Throat River	1,770,186	5,027,436	4,115,319	147,750	1,360,000	392,750	76,000	472,200	881,800	
Keewatin Lumbering & Manf. Co.	Keewatin	Water...	400	120,000	1880	Red and white pine.	Islands, Lake of the Woods	33,774	24,274	9,500							800,000 feet logs stuck in drive.
4 Likely, John	Manitou Rapids	Steam...	16	3,000	1884	Spruce and jack pine	Bear River, tributary of Winnipeg River	744,155	900,289	373,037	486,000	470,000	163,000	134,400	124,200	10,200	
Manitoba and North-West Railway.	Ebb and Flow Lake	do	16	3,000	1885	do and tamarac..	West Shore Lake Manitoba	26,000	26,000	20,000	45,000	45,000					Limit abandoned.
Miller & Patton	Birtle	do	25	6,000	1880	Spruce	Bird Tail Creek	3,245,750									Mill not run, season 1886.
McKay, Jas. W.	Carberry	do	16	3,500	1880	do	Township 10, Range 15, W. of 1st	113,000	157,368	30,145	476,000	406,000	70,000				
McDonald & Shields	Vermillion Bay	do	75	30,000	1883	Red and white pine.	East side Riding Mountain	258,317	145,610	16,000	74,250	10,250		2,800	4,500		Limit abandoned.
McFadyen, David	Section 19, Township 17, Range 16, W. 1st.	do	16	3,000	1884	Spruce	Lake Max, Turtle Mountain	74,000	126,121	13,425	60,000	76,500	28,500				Logs purchased from Sheriff by Jas. Cocoran, of Stratford, Ont
Morton, George	Turtle Mountain	do	40	12,000	1882	Poplar and oak	Dog Head, Lake Winnipeg	939,199	694,189	245,000							
5 North-West Timber Co.	Selkirk	do	75	35,000	1883	Spruce	Rainy Lake	3,052,660	110,004	3,001,554				5,550	5,550		
Rainy Lake Lumber Co.	Rat Portage	do	95	60,000	1883	Red and white pine..	do		51,143	1,182,197					64,500	60,050	Mill used to cut logs cut on John Stewart's limit.
do	St. Francis	Water...				do	do										
Ross, Crawford	Whitemouth	Steam...	35	10,000	1880	Spruce	Township 33, Range 2, W. of 2nd P. M.	1,528,755	1,135,279	952,030							
Ross, David	Turtle Mountain	do	20	3,500	1881	do	East side Whitemouth River	258,317	145,610	16,000	74,250	10,250		2,800	4,500		Mill destroyed by fire.
Smith, Samuel	Winnipeg	do	45	20,000	1882	Poplar and oak	Turtle Mountain	1,800,000	1,423,253	2,195,487				128,800	138,300	69,200	Saw log timber on limits all cut off.
Sprague, D. E.	Winnipeg	do				Red and white pine..	Rosseau River										No mill.
6 Stubbs, W. H.	Brandon	Steam...				Spruce	Limit "D," Winnipeg River	40,003	221,776								Mill used in cutting logs purchased from John Stewart.
7 Shields et al.	Fort Ellice	do	20	3,000	1883	do	Shell River	207,480	127,806	79,674	12,000	12,000					
Stewart, John	Norquay	do	16	3,000	1882	do	Township 32, Range 3, W. of 2nd		99,997	92,870		158,000	101,500				Mill destroyed by fire.
Watts, Alfred	Balmoral	do	15	3,000	1884	Poplar and oak	do 7, Range 9, W. of 1st	94,846									
Wells Brothers	Wakopa	do	25	6,000	1880	Spruce and poplar ..	do 17, Range 2, E. of 1st	86,715	33,232	53,483	31,250	34,250					
Williams & Harrison	Strathclair	do	25	6,000	1880	Poplar and oak	Turtle Mountain	223,246	358,918	240,000	159,500	169,250	424,000				
Whimster & Kyall	Shellmouth	do	75	30,000	1885	Spruce	Riding Mountain										
Mitchell & Bucknell.....	Shellmouth	do				do	Little Boggy Creek										Returns not to hand.
Totals								17,547,644	21,773,069	16,988,483	3,176,500	3,839,250	2,470,500	790,200	1,628,900	1,460,150	

1. Adams & Schnider.

2. Armitage & McCulloch.

3. Federal Bank of Canada.

4. John Likely.

5. North-West Timber Co.

6. W. H. Stubbs.

7. Shields et al.
- Assigned to Dick & Banning.

do Jermyn & Bolton.

do Wm. Robinson.

do Sharp & Wilkes.

do Creditors.

do Bank of Montreal.

In liquidation.

Certified correct,

E. F. STEPHENSON,

Crown Timber Agent.

SCHEDULE C.

GENERAL OFFICE Return for Twelve Months ending 31st October, 1886.

Description of Return.	Number.	Compared with Previous Year.	
		Increase.	Decrease.
Number of letters written.....	3,062		80
do circulars sent	1,621	151	
do letters received.....	1,435		189
do permits issued, homesteaders free.....	1,048		306
do do subject to dues	508	90	
do seizures made	229		203
do mill returns received and verified.....	89		28

COMPARATIVE PRICES of Lumber sold at the principal points in the Winnipeg District, during the Years 1885 and 1886.

Place.	Kind.	1885.	1886.
Birtle, Man.	Spruce and tamarac, per M. feet.....	\$15 00 to \$20 00	\$15 00 to \$20 00
Brandon, Man.	do do do	15 00 " 20 00	12 00 " 20 00
Minnedosa, Man.	do do do	12 00 " 20 00	10 00 " 20 00
Moose Jaw, Assa.	do do do	18 00 " 25 00	15 00 " 25 00
do	Pine do do	20 00 " 30 00	20 00 " 30 00
Moosomin, Assa.	Spruce and tamarac do	15 00 " 18 00	15 00 " 18 00
Rapid City, Man.	do do do	12 00 " 20 00	10 00 " 20 00
Rat Portage, Ont.	Pine do do	9 00 " 20 00	9 00 " 20 00
Turtle Mountain, Man.	Spruce, tamarac and poplar, per M. feet...	15 00 " 30 00	10 00 " 16 00
Regina, Assa.	do do do	18 00 " 25 00	15 00 " 18 00
do	Pine do do	20 00 " 30 00	18 00 " 30 00
Selkirk, Man.	Spruce and tamarac do	8 00 " 12 00	8 00 " 12 00
Winnipeg, Man.	do do do	10 00 " 16 00	10 00 " 16 00
do	Pine do do	13 50 " 25 00	13 00 " 25 00

E. F. STEPHENSON,
Crown Timber Agent.CROWN TIMBER OFFICE,
WINNIPEG, 31st October, 1886.

[PART I]

EDMONTON CROWN TIMBER AGENCY.

DEPARTMENT OF THE INTERIOR,
CROWN TIMBER OFFICE,
EDMONTON, 31st October, 1886.

SIR,—I have the honor to enclose the annual statements of my office, which show a marked improvement on last year's statements.

The quantity of sawn lumber is 961,321 feet, being 836,961 feet in excess of last year. The local demand is in excess of the supply, and before next season the market will be quite bare of lumber.

Early in this year the Hudson's Bay Company's mill was burned down. They have decided not to rebuild.

Two small mills were taken into the woods some thirty or forty miles above Edmonton, and have partly supplied this place with lumber. Another small mill is at present being put in operation by the Hudson's Bay Company on the Athabasca River, at the landing, about 100 miles due north of Edmonton, for their own use, as there are no settlers in that section yet.

The Alberta Lumber Company and also the Saskatchewan Land Company purpose putting up saw mills at or near Edmonton, which, with those we have, will give employment to a large number of men, and bring, I hope, a large revenue to the office.

The number of permits granted also shows an increase of forty-three over last year.

The correspondence also shows a marked increase.

The crops during the past year have produced a very large return.

In conclusion, the prospects for next year appear much more favorable than at any time since I have been here, and I fully expect a large business to be done in lumber.

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

THOS. ANDERSON,
Crown Timber Agent.

A. M. BURGESS, Esq.,
Deputy of the Minister of the Interior,
Ottawa.

SCHEDULE A.

STATEMENT of Receipts on account of Crown Timber, for the twelve months ending the 31st October, 1886.

Month.	Bonus.	Ground Rent.	Royalty on Returns of Sales.	Permit Fees and Dues.	Seizures Dues and Fines.	Total.	Amounts collected at Head Office.	Totals.
1885.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
November.....								
December.....		50 00		21 60		71 60		71 60
1886.								
January.....				3 50		3 50		3 50
February.....				25 75		25 75		25 75
March.....		48 63		34 42	4 00	87 05		87 05
April.....		230 00	59 45			289 45	1,602 50	1,891 95
May.....	160 00			24 17		184 17	540 98	725 15
June.....		40 00	10 40	128 12		178 52		178 52
July.....			364 84	21 00		385 84		385 84
August.....				51 00		51 00		51 00
September.....			56 84	17 65		74 49		74 49
October.....			105 79	104 71		210 50		210 50
Totals.....	160 00	368 63	597 32	431 92	4 00	1,561 87	2,143 48	3,705 35
Amounts collected at Head Office.....		2,143 48						
Totals.....	160 00	2,512 11	597 32	431 92	4 00			
Add \$413.32 collected prior to 1st November, 1885, and received at Head Office subsequent to that date.....								413 32
Deduct \$210.50 collected prior to 31st October, 1886, but not received at Head Office until after that date.....								4,118 67
Grand Total.....								210 50
								3,908 17

THOS. ANDERSON,
Crown Timber Agent.

CROWN TIMBER OFFICE,
EDMONTON, 31st October, 1886.

SCHEDULE B.

GENERAL Office Return for the Twelve Months ending 31st October, 1886.

Description of Return.	Amount.	Compared with previous year.		Remarks.
		Increase.	Decrease.	
Number of letters written	532	197		
do do received	201	19		
do permits issued	66	43		
do seizures	2	.....	1	
do mill returns made	11	7		
do leases cancelled				

THOS. ANDERSON,
Crown Timber Agent.

CROWN TIMBER OFFICE,
EDMONTON, 31st October, 1886.

SCHEDULE C, showing the Saw Mills in the Edmonton Crown Timber Agency, operating under Government License, during the Year ending the 31st October, 1886.

Name of Owner or Owner and Assignee.	Where situated.	Kind of Power.	Horse Power.	Capacity for 12 hours.	Commenced operations	Description of Timber.	Logs cut at	Quantity of Lumber manufactured during the Year ending 31st October, 1886.	Quantity of Lumber sold during the Year ending 31st October, 1886.	Quantity of Shingles manufactured during the Year ending 31st October, 1886.	Quantity of Shingles sold during the Year ending 31st October, 1886.	Quantity of Laths manufactured during the Year ending 31st October, 1886.	Quantity of Laths sold during the Year ending 31st October, 1886.
Hudson Bay Co....	Edmonton.	Steam...	40	10,000	1880	Spruce.....	None.....	Ft. B. M.	Ft. B. M.	No.	No.	Badls.	Badls.
Hardisty & Fraser.	do	do ..	30	10,000	1880	Spruce and poplar	On Kelly's limit.....	None.	110,558	None.	None.	None.	None.
Lameureux Bros....	Stoney Plain....	do ..	20	5,000	1883	do	Stoney Plain, North Saskatchewan River.	344,766	463,726	None.	None.	None.	None.
John Kelly.	White Mud.	do ..	40	10,000	1885	Spruce.....	Near White Mud, on North Saskatchewan River.	547,973	418,634	242,750	216,750	56,500	45,500
St. Albert Mission	St. Albert	Water..	20	5,000	1882	do	Egg Lake	11,148	11,148	24,000	24,000	None.	None.
Total.....	.....	.....	.....	.....	.....	.....	.....	961,321	1,004,068	367,500	341,500	56,500	45,500

THOS. ANDERSON,
Crown Timber Agent.

EDMONTON, 31st October, 1886.

PRINCE ALBERT CROWN TIMBER AGENCY.

CROWN TIMBER OFFICE,
PRINCE ALBERT, 31st October, 1886.

SIR,—I have the honor to submit my annual report of the business transacted within my agency during the year ended this date.

Annexed hereto are the following statements :—

A. Statement showing revenue derived from timber dues.

B. Number of saw mills operating under Government license in the District of Saskatchewan, together with the quantities of building material manufactured, sold and on hand by each licensee respectively.

C. General office returns and other information respecting the work of this office.

I have the honor to be, Sir,

Your obedient servant,

D. J. WAGGONER,
Crown Timber Agent.

A. M. BURGESS, Esq.,
Deputy of the Minister of the Interior,
Ottawa.

SCHEDULE A.
STATEMENT of Receipts on account of Crown Timber for the Twelve Months ending the 31st October, 1886.

Month.	Bonus.	Ground Rent.	Royalty on Returns of Sales.	Permit Fees and Dues.	Seizures, Dues and Fines for Trespass.	Total.	Amounts collected at Head Office.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1885.								
November .....	.....	.....	.....	37 25	.....	37 25	250 00	287 25
December .....	.....	.....	.....	302 00	63 16	385 16	.....	385 16
1886.								
January .....	.....	.....	.....	7 50	42 75	50 25	250 00	300 25
February .....	.....	.....	.....	72 42	.....	72 42	.....	72 42
March .....	.....	.....	.....	75 85	.....	75 85	.....	75 85
April .....	.....	.....	.....	189 63	.....	189 63	.....	189 63
May .....	.....	.....	.....	4 20	.....	4 20	519 23	523 43
June .....	.....	.....	.....	154 45	.....	682 85	210 00	893 85
July .....	.....	.....	528 40	257 39	.....	257 39	1,250 00	1,507 39
August .....	.....	.....	.....	159 95	.....	159 95	.....	159 95
September .....	.....	.....	.....	688 78	.....	688 78	.....	688 78
October .....	.....	.....	.....	35 14	.....	35 14	.....	35 14
Totals			528 40	1,964 56	105 91	2,698 87	2,509 23	5,108 10
Amount collected at Head Office.....		2,372 30	92 08	.....	44 85	.....	.....	.....
Totals		2,372 30	620 48	1,964 56	150 76	.....	.....	.....
Add \$350.50, amount collected prior to 1st November, 1885, and received at Head Office after that date								
Deduct \$23.04, amount collected prior to 31st October, 1886, but not received at Head Office until after that date.....								
							350 50	.....
							5,458 60	.....
							23 04	.....
							5,425 56	.....

D. J. WAGGONER,
Crown Timber Agent.

CROWN TIMBER AGENT,
PRINCE ALBERT, 31st October, 1886.

SCHEDULE B.

SHOWING the Saw-Mills in the Prince Albert Crown Timber Agency, operating under Government License, during the Year ending 31st October, 1886.

Name of Owner or Owner and Assignee.	Where Situated.	Kind of Power.	Horse Power.	Capacity per twelve hours.	Commenced opera- tions.	Description of Timber.	Logs Cut at	Quantity of Lumber manufactured dur- ing the Year end- ing 31st October, 1886.	Quantity of Lumber sold during the Year ending 31st October, 1886.	Ft., B.M.	Ft., B.M.	Quantity of Shingles manufactured dur- ing the Year end- ing 31st October, 1886.	Quantity of Shingles sold during the Year ending 31st October, 1886.	No.	No.	Quantity of Laths manufactured dur- ing the Year end- ing 31st October, 1886.	Quantity of Laths sold during the Year ending 31st October, 1886.	Bundles.	Bundles.
Moore & Macdowall.	Prince Albert, N.W.T.	Steam	75	35,000	1876	Spruce, pine and Poplar	Sturgeon River..	407,122	534,414	407,122	534,414	769,000	544,666	769,000	544,666	27,850	27,850	66,800	66,800
Thomas McKay.....	do	do	16	5,000	.....	Spruce and poplar..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
R. G. Reid.....	Battleford, N.W.T.	do	40	15,000	1881	Pine and poplar...	Turtle Lake	407,122	534,414	407,122	534,414	769,000	544,666	769,000	544,666	27,850	27,850	66,800	66,800

D. J. WAGGONER,
Crown Timber Agent.

CROWN TIMBER OFFICE,
PRINCE ALBERT, 31st October, 1886.

SCHEDULE C.

GENERAL Office Returns for the Twelve Months ending 31st October, 1886.

Description of Return.	Number.	Compared with previous year.	
		Increase.	Decrease.
Number of letters written	633	283	
do do received	382	102	
do permits issued	176	58	
do seizures made			
do mill returns received	3		

D. J. WAGGONER,

Crown Timber Agent.

CROWN TIMBER OFFICE,
PRINCE ALBERT, 31st October, 1886.

CALGARY CROWN TIMBER AGENCY.

DEPARTMENT OF THE INTERIOR,
CALGARY, 9th December, 1886.

SIR,—I have the honor to submit my annual report of the business transacted within the Alberta District for the year ending 31st October, 1886.

A. Statement showing revenue derived from timber dues.

B. Number of saw mills operating under Government license in the District of Alberta and part of Assiniboia.

C. General office return and other information respecting the work of this office.

In my last year's report I mentioned a general improvement throughout this district; this improvement has continued, and from present appearances it is likely to continue. There are now five mills operating in this district under Government license, and the Eau Claire and Bow River Company's mill is near completion and will be sawing in a few days.

Lumber is being shipped from British Columbia and of a better quality than is got out in this district; in consequence it has brought down prices.

The town is still progressing rapidly in the erection of buildings; the sum expended will reach at the end of the present year, 31st December, 1886, \$250,000.

We have had our usual fine weather this fall.

I have the honor to be, Sir,

Your obedient servant,

C. L. GOUIN,

Crown Timber Agent.

A. M. BURGESS, Esq.,
Deputy of the Minister of the Interior,
Ottawa.

[PART I]

69

SCHEDULE A.

STATEMENT of Receipts on account of Crown Timber, for the Twelve Months ending the 31st October, 1886.

Month.	Bonus.	Ground Rent.	Royalty on Sales.	Dues on Permits	Dues and Fines for Trespass.	Total.	Amounts collected at Head Office.	Total.
1885.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
November			54 13	99 25	.....	153 38	512 61	665 99
December				26 25	.....	26 25		26 25
1886.								
January			7 11	9 68	1 75	18 54	87 50	106 04
February				17 50	.....	17 50	5,869 05	5,886 55
March			195 28	12 50	.....	207 78		207 78
April				3 50	.....	3 50	1,000 00	1,003 50
May		250 00	39 68	106 84	.....	396 52	264 60	661 12
June		250 00		51 00	.....	301 00		301 00
July				9 50	.....	9 50	435 00	444 50
August			91 50	5 50	.....	97 00		97 00
September			27 03	38 14	.....	65 17	375 00	440 17
October			49 01	85 33	.....	134 34	500 00	634 34
Total		500 00	463 74	464 99	1 75	1,430 48	9,043 76	10,474 24
Amount collected at Head Office...	875 00	5,666 13	2,502 63	.....	.....	
Total	875 00	6,166 13	2,966 37	464 99	1 75			
Add \$591.07 collected prior to 1st November, 1885, and received at Head Office subsequent to that date.								591 07
								11,065 31
Deduct \$134.34 collected prior to 31st October, 1886, but not received at Head Office until after that date								134 34
Total								10,930 97
School lands								1,096 61
Grand total								12,027 58

C. L. GOUIN,
Crown Timber Agent.

CROWN TIMBER OFFICE,
CALGARY, 31st October, 1886.

SCHEDULE C, showing the Saw Mills in the District of Alberta, and a portion of the District of Assiniboia, operating under Government License, during the Year ending 31st October, 1886.

Name of Owner or Owner and Assignee.	Where Mill situated.	Kind of Power.	Horse Power.	Capacity per 12 hours.	Commenced Operations.	Description of Lumber.	Logs Cut at	Quantity of Lumber manufactured during Year ending 31st October, 1886.	Ft. B. M.	Quantity of Lumber sold during Year ending 31st October, 1886.	Quantity of Shingles manufactured during Year ending 31st October, 1886.	No.	Quantity of Shingles sold during Year ending 31st October, 1886.	Quantity of Laths manufactured during Year ending 31st October, 1886.	Badls.	Quantity of Laths sold during Year ending 31st October, 1886.
James Walker	Calgary	Steam	20	10,000	Feb., 1883	Spruce	Calgary	154,965	170,969	38,000	83,500	24,400	None.	None.	24,400	24,400
Louis Sands	Cypress Hills	do ...	75	40,000	April 1883	Pine and spruce..	On limit	315,115	89,452	197,250	22,250	do	do	do	do	do
Peter McLaren ...	Mill Creek	Water	30	5,000	Jan., 1882	Spruce, fir and Pine	Mill Creek	307,798	195,193	None.	111,250	do	do	do	do	do
N.-W. Coal and Navigation Co.	Lethbridge on Bell River.	on Steam	20	5,000	1892	Spruce	South Fork of Old Man's River.	1,506,701	1,285,662	192,000	192,000	do	do	do	do	do
Calgary Lumber Co.	Cochrane	do ...	75	20,000	June, 1886	Spruce and cypress pine.	Cochrane	54,493	14,179	6,500	6,100	12,000	12,000	12,000	12,000	12,000
Eau Claire and Bow River Transportation Co.	(Near completion.)							(No returns yet received.)								
Total								2,338,072	1,755,455	433,750	415,500	36,400	36,400	36,400	36,400	36,400

C. L. GOULIN,
Crown Timber Agent.

CROWN TIMBER OFFICE,
CALGARY, 31st October, 1886.

SCHEDULE B.

GENERAL Office Return for the Twelve Months ending 31st October, 1886.

Description of Return.	Number.	Compared with Previous Year.		Remarks.
		Increase.	Decrease.	
Number of letters written	295	67		
do received	252	41		
Permits issued.....	179	75		
Seizures made				
Mill returns received	22			
Leases cancelled.....				

C. L. GOUIN,
*Crown Timber Agent.*CROWN TIMBER OFFICE,
CALGARY, 31st October, 1886.

BRITISH COLUMBIA CROWN TIMBER AGENCY.

NEW WESTMINSTER, B.C., 31st December, 1886.

SIR,—I have the honor to submit the following report of timber matters in this Province, up to the present date:—

By instructions from your Department, after exploring the resources of the 40-mile railway belt, during the years 1884 and 1885, I opened an office here on the 1st of May last, and immediately proceeded to collect the dues on timber cut since the 19th December, 1883, the date of the Act known as the Settlement Act between the Province and the Dominion. The dues (having been established by request of the representatives of the Province at a very low rate, so as to conform with those of the Local Government) were paid without hesitation, a statement of which, with the number of mills in operation in the belt, I herewith attach.

I may state that the lumber business generally looks most encouraging.

The local trade, owing to the building up of the terminus of the Canadian Pacific Railway (the most important one commercially to us, and to Great Britain generally, in the world) as well as the growth of other towns and villages, and also the large influx of actual settlers in the belt, has given an unprecedented impetus to the trade. The fact of some of the largest mills having limits from the Local Government at or near the coast prevents me from giving anything like an actual statement of the lumber manufactured in the Province; suffice it to say, that the trade is rapidly expanding—that of export not being confined alone to the markets of China, Japan, Australia, and the South American Provinces, but, since the opening up of direct railway communication with the eastern portion of the Dominion early in July last, considerable of the better grades of Douglas pine, spruce and cedar, have found a market as far east as Montreal, and, doubtless, owing to their superior quality for many purposes, these woods, especially from the western slope of the Rocky Mountains, will find a large market, extending from Calgary to the above named city.

The entire belt from the summit of the Rockies to the coast, a distance of 500 miles, being heavily timbered with these soft woods, has, as was expected, suffered considerably from fire during the past season, but, fortunately, the damage did not extend any great distance from the line of railway.

There is, therefore, every reason to look hopefully to the future expansion of this trade in the Province.

The annexed statement does not include the lumber cut by the Canadian Pacific Railway Company, amounting to about 75,000,000 feet.

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

T. S. HIGGINSON,
Crown Timber Agent for British Columbia.

A. M. BURGESS, Esq.,
Deputy Minister of the Interior,
Ottawa.

SCHEDULE A.

STATEMENT of Receipts on account of Crown Timber, for the twelve months ending 31st October, 1886.

Months.	Bonus.	Ground rent.	Royalty on returns of sales.	Permit fees and dues.	Seizures, dues and fines for trespass.	Totals.
1885.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
November					105 00	105 00
December				24 25	72 61	96 86
1886.						
January					262 35	262 35
February		10 00			90 88	100 88
March					21 50	21 50
April					823 41	3,978 40
May	727 50			2,417 49	248 06	2,488 04
June					79 70	615 70
July	536 00				527 32	1,069 48
August		20 00		1,093 04	1,175 00	2,288 04
September		10 00		280 39	80 00	370 39
October						
	1,263 50	40 00		4,605 39	3,247 77	9,156 66

T. S. HIGGINSON,
Crown Timber Agent.

NEW WESTMINSTER, B.C., 31st October, 1886.

SCHEDULE B.

GENERAL Office Returns for the twelve months ending the 31st October, 1886.

Description of Return.	Number.	Compared with previous year.	
		Increase.	Decrease.
Number of Letters written	408		
do do received	309		
do Permits issued	1	1	
do Seizures made	14	14	
do Mill returns received	13	13	

T. S. HIGGINSON,
Crown Timber Agent.

BRITISH COLUMBIA,

NEW WESTMINSTER, 31st October, 1886.

SCHEDULE C. Showing the Saw Mills in the Province of British Columbia cutting Timber on Dominion Lands, during the Year ending the 31st October, 1886.

Name of Owner or Owner and Assignee.	Where Mill situated.	Kind of Power.	Horse Power.	Capacity per 12 Hours.	Commenced Operations.	Description of Lumber.	Logs Cut at	Quantity of Lumber Manufactured during Year ending 31st October, 1886.	Quantity of Lumber sold during Year ending 31st October, 1886.	Remarks.
The Royal City Planing Mills Company	Townships 1 and 2, group 2.....	11,994,798	11,994,798	
*The Dominion Saw Mill Company	do	3,920,000	3,920,000	
W. C. McDougall	do	1,126,885	1,126,885	
J. B. Tiffin	do	874,750	874,750	
William Jones	do	350,000	350,000	
Total	18,266,433	18,266,433	

*The Dominion Saw Mill Company assigned to the Royal City Planing Mills.

T. S. HIGGINSON,
Crown Timber Agent.

BRITISH COLUMBIA,
NEW WESTMINSTER, 31st October, 1886.

No. 5.

REPORT RESPECTING CLAIMS BY HALF-BREEDS.

OTTAWA, 12th January, 1887.

SIR,—I have the honor to submit the following general report on the investigation which I have made under the powers vested in me by the Order in Council and your letter of instructions, dated respectively the 1st of March and the 17th of May last, of the claims which were preferred before me during the past season, by half-breeds, to participate in the grant of scrip or land authorized by sub-clause E of clause 81 of the Dominion Lands Act, 1883.

I left Winnipeg on the 31st of May last, and returned to that place on the 17th ultimo. During that period, I held sittings of the Commission at the following places, namely:—

Swift Current, Maple Creek, Calgary, Red Deer Crossing, Battle River or Laboucane Settlement, Peace Hills, Edmonton, St. Albert, Victoria, Lac la Biche, Fort Pitt, Battleford, Prince Albert, St. Laurent, Fort Qu'Appelle, and Fort Ellice.

With the assistance of Mr. N. O. Côté, the Secretary of the Commission, and Mr. George Duck, Clerk of the Commission, I have received and investigated 1,414 applications, which are all entered in the registers supplied to me for that purpose (Enclosures "A" and "B").

One thousand one hundred and sixty-four of these applications have been allowed, and out of that number 602 are from half-breeds who withdrew last summer from the Indian treaties to which they formerly belonged. Two hundred and ninety are from persons who never participated in any grants to the Indians, and 267 are by the legal representatives of deceased half-breeds who died at a date subsequent to the 15th day of July, 1870, and who, had they been living, would, themselves, have been entitled to participate in the grant to half-breeds.

I have also included in the above mentioned total number of claims which I have allowed, the claims of three North-West original white settlers, as well as the claims preferred by the legal representatives of two deceased original white settlers. (I was authorized to deal with these claims by Order in Council of the 19th April, 1886.)

I have disallowed altogether forty-four claims, on account of the claimants having been, at the time of the transfer, residents of the United States, or born after that date, and I have reserved the applications of 205 claimants, which I have classified as follows:—

Claims requiring further proof, one hundred and forty-three.

Claims of persons who were residents of the Province of Manitoba on the 15th day of July, 1870, but who have never received land or scrip in the said Province, thirty-one.

Claims of persons who were residing, on the 15th July, 1870, in the territory which has not yet been ceded by the Indians under treaties, twenty-nine.

Claims preferred by the legal representatives of deceased North-West original white settlers requiring further evidence, three.

Attached hereto is a schedule, marked "C," showing in detail the number of claims which were preferred at each place where I have held sittings of the Commission.

I have received further evidence in many cases which were reserved by the Commission of 1885, owing to such evidence not having then been procurable, and to such of those persons as furnished me with the necessary proof in support of their claims, I have given certificates for scrip.

I have also issued certificates to such of the heirs of deceased half-breeds as came before me, whose claims were proved before the Commission in 1885, but who did not then appear to receive their shares as such heirs.

Those half-breeds, 192 in all, from whose scrip certificates a sum equal to the amount they had received under the Indian treaties to which they formerly belonged, was kept by the first Commission, have been granted certificates by me, in accordance with the instructions given me to that effect, as a refund of the amount so deducted.

The total amount of scrip certificates on the several forms, which have been issued by me, is shown by the following statement :—

MONEY SCRIP.

Form A, 1,017.....	\$183,639 00
do B, 789.....	59,810 14
do D, 77.....	18,240 00
<u>1,883</u>	<u>\$261,689 14</u>

LAND SCRIP.

Form C, 8.....	1,920 acres.
do E, 3.....	720 do
<u>11</u>	<u>2,640 do</u>

Although there were 1,894 certificates issued by me, they only represent 1,164 individual claims, and the difference between the number of certificates granted and the number of claims allowed is accounted for in the following manner, that is to say :—

On the Form "A," some 290 certificates were issued as a refund of the small sums which were deducted by the Commission of 1885, from the certificates granted to half-breeds who had received payments in cash, as Indians, equal to the amount so deducted.

The certificates on the Form "B" were all issued to the legal representatives of deceased half-breeds, and in nearly every case of this nature, one individual claim had to be divided amongst eight or ten direct heirs; and, in some instances, one or more of these direct heirs being dead, their share had to be subdivided amongst as many heirs again, making sometimes as many as thirty certificates to be issued for one individual claim of \$160.

The total amount of scrip certificates issued by me, as above, also covers certificates amounting to \$22,844.13 which I have granted, as follows, on applications which were made before the Commission in 1885, but were then reserved for the reasons already stated :—

Refund of Treaty money.....	\$ 8,245 98
Claims with respect to which I have procured the required evidence.....	3,773 32
Legal representatives of deceased half-breeds whose claims were proved in 1885.....	7,730 29
Claims reserved, owing to claimants having participated in the North-West outbreak.....	3,094 54
	<u>\$22,844 13</u>

It will be observed that the majority of claims which have been preferred this year are from Half-breeds who were previously in receipt of annuities as Indians. Apart from the claimants at Peace Hills—twenty-eight in all—who had obtained their discharges from Treaty before my arrival at that place, I am confident, in view

of the great precautions which were taken by Mr. T. P. Wadsworth, Inspector of Indian Agencies, who accompanied the Commission to St. Albert, Victoria, Lac la Biche, Fort Pitt, Battleford, Prince Albert and St. Laurent, the Indian agents and myself, to ascertain whether or not the applicant for withdrawal would be capable, in the event of his being allowed to leave the treaty, to support himself and family without the assistance of the Government, that no fear need be apprehended that this class of half-breeds who have severed their connection with the Indian Treaties and have been granted scrip, will have to be taken back on the reserves.

I regret that owing to the season being so far advanced, after completing the investigation of claims at Prince Albert and St. Laurent, I was unable to visit Fort à la Corne, The Pas, Cumberland House, Grand Rapids, on the North Saskatchewan, Norway House, Beren's River and Fort Alexander, on Lake Winnipeg, and Manitoba House and Fairford, on Lake Manitoba, at which places, I am informed, many persons have been granted their discharge from Treaty.

In my opinion, it is important, in order to complete the settlement of these claims, that arrangements should be made to have the Commission start out at as early a date as possible next spring, for the purpose of holding sittings at the above mentioned places, excepting Manitoba House, which it is proposed I shall visit during the present month.

In the case of the thirty-one claims already mentioned, which are preferred by persons who were residing in the Province of Manitoba on the 15th July, 1870, in support of which I have received the necessary evidence, but which cannot be allowed without special authority of Council, in consequence of the Order in Council of the 20th of April, 1885, which limited the time for making such applications to the 1st of May, 1886, I beg to recommend, although I am quite satisfied that those who were residing within the original Province of Manitoba at the time the said Order in Council of the 20th of April, 1885, was passed, have been given ample time and facility to submit the evidence in support of their claims, that, in view of the fact that the persons who preferred these thirty-one claims were residing at great distances from Winnipeg at the time of the passing of that Order in Council, and as they have been residents of the ceded portions of the North-West Territories for many years and are still residing therein, the authority of Council be obtained to deal with these cases in the same manner as if they had been presented within the time prescribed by the Order in Council referred to of the 20th of April, 1885.

With regard to the twenty-nine claims already alluded to in this report, which have been preferred by persons who were residents of the unceded portions of the North-West Territories on the 15th day of July, 1870, but who came in to the territory which has since been ceded by the Indians under treaties, some in 1871, and some in 1872, and who have continuously resided therein ever since, I would recommend, in view of the comparatively small number of claims of that class, and of the fact that the claimants have always been and are still residents of the North-West Territories, that the Minister of the Interior obtain from Council authority to deal with the claims in question in a manner similar to that under which were dealt with the claims of persons who were residents on the 15th day of July, 1870, in the territory which the Indians have ceded by treaty.

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

R. GOULET,
Half-breed Commissioner.

A. M. BURGESS, Esq.,
Deputy of the Minister of the Interior,
Ottawa.

SCHEDULE C.

DETAILED Schedule of Claims preferred before the North-West Half-breed Commission, during the Season of 1883.

	Non-Treaty.			Treaty.			Deceased.			O. W. Settlers			Reserved.					Grand Total.	Money Scrip.	Land Scrip.			
	Heads.	Children.	Total.	Heads.	Children.	Total.	Heads.	Children.	Total.	Living.	Deceased.	Total.	Manitoba.	Outside ceded Territory.	Further evidence required.	O. W. Settlers.	Total.				Disallowed.		
Winnipeg.....	1	3	4	2	1	3	7	...	1	...	1	2	10	\$ cts.	2,190 00	Acres.	2,190 00
Swift Current.....	6	4	10	1	...	1	...	...	...	...	...	...	12	...	...	...	...	12	12	2,202 68	240	2,202 68
Maple Creek.....	...	13	4	1	15	...	...	...	...	...	...	...	29	...	4	...	...	33	33	6,069 32	240	6,069 32
Calgary.....	1	8	9	12	23	35	9	27	36	...	...	...	80	...	8	...	10	1	91	14,624 24	240	14,624 24
Red Deer Crossing.....	...	...	...	1	5	6	...	...	...	...	...	...	7	...	4	...	6	1	14	1,907 00	240	1,907 00
Battle River Settlement.....	3	4	7	1	...	...	...	...	...	...	...	...	13	...	2	...	2	2	17	4,207 22	240	4,207 22
Peace Hills.....	...	...	...	1	13	15	28	4	6	...	...	...	39	...	3	...	3	...	42	7,672 09	240	7,672 09
Edmonton.....	5	20	25	16	35	51	11	9	20	...	...	...	97	...	6	...	6	3	105	25,659 98	240	25,659 98
St. Albert.....	8	16	23	23	47	70	29	82	111	...	...	...	206	...	12	2	14	2	232	50,634 37	240	50,634 37
Victoria.....	...	...	...	1	4	16	20	2	4	...	...	...	25	...	...	...	1	...	26	6,635 49	240	6,635 49
Lac La Biche.....	28	63	91	38	61	89	10	14	24	...	...	...	201	...	1	...	18	4	236	42,909 10	240	42,909 10
Fort Pitt.....	...	...	...	2	6	10	16	2	1	...	...	...	22	...	...	...	...	...	22	4,693 17	240	4,693 17
Battleford.....	3	13	16	25	49	74	2	5	7	...	...	...	97	...	2	...	...	2	115	21,550 22	240	21,550 22
Prince Albert.....	11	39	50	16	48	64	3	2	5	...	...	...	119	...	8	...	5	3	160	26,129 80	1,410	26,129 80
St. Laurent.....	9	15	24	7	16	23	2	13	15	...	...	...	62	...	6	...	6	9	81	15,519 47	240	15,519 47
Qu'Appelle.....	1	7	8	34	66	100	10	14	24	...	...	...	133	...	30	...	30	13	176	27,771 68	240	27,771 68
Fort Ellice.....	2	3	5	2	4	6	...	...	...	...	...	...	12	...	6	...	6	2	20	2,353 33	240	2,353 33
Regina.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	38	...	38	...	38	...	2,640	2,640
	78	212	290	205	397	603	85	182	267	3	2	5	1,164	31	29	143	3	206	44	261,689 24			

* The evidence in these cases was taken by Mr. H. E. Forget, Clerk of the North-West Council, under instructions from the Minister of the Interior.

N. OMER CÔTÉ,
Secretary Half-breed Commission.
OTTAWA, 12th January, 1887.

R. GOULET,
Half-breed Commissioner.

No. 6.

NATIONAL PARK AND HOT SPRINGS.

HOT SPRINGS, ARK., 10th March, 1886.

To A. M. BURGESS, Esq.,
Deputy Minister of the Interior,
Ottawa, Canada.

SIR,—In accordance with your instructions I left Ottawa on the 30th January last, for the purpose of examining and reporting upon the management of the Hot Springs of this place, and, after a detention by a snow blockade south of St. Louis, arrived here on the 4th ultimo.

My visit happens at a very opportune time, as the introduction in the Senate of a Bill by Senator Berry, "to provide for the control of the reservation of public lands, and the distribution of hot water at Hot Springs, Arkansas," a copy of the full text of which is hereto annexed (A), has caused a general discussion of the whole subject from three different points of view, namely: that of the owners of bath-houses who seek a renewal of their leases; that of the citizens of Hot Springs who are opposed to monopoly and want liberty to draw the waters to any part of the town, paying therefor whatever rent may be fixed by the Government; and that of the people who come here in search of health, the majority of whom desire to see the Government assume entire control of the bathing as the best solution of the question and the one most likely to ensure that combination of intelligent supervision, modern appliances, cleanliness and civility now so much needed.

LEASES.

The present position of the lease question is that all the leases which, by the Act of 16th December, 1878 (20 Stats., chap. 5, p. 258), the Secretary of the Interior was directed to make with the owners of bath houses of a permanent nature then existing upon the Hot Springs Reservation, have expired, having been made for five years dating from the passage of that Act (16th December, 1878).

So far, all applications for renewal of those leases have been refused, but the lessees have been permitted to remain in possession, paying water rent at the authorized rates.

The prolonged uncertainty as to the intentions of the Government has had a bad effect on the whole conduct of the bath house business. The houses have been allowed to get out of repair, and there is a very apparent laxity in the management of details.

THE SUPERINTENDENT.

Shortly after my arrival I called upon General Field, the resident superintendent of the Government Reservation, who received me courteously, and presented me with a copy of his report to the Secretary of the Interior, dated 23rd September, 1885, covering also a copy of that of his predecessor, Mr. Samuel Hamblen, for the year ending 30th June, 1885, which I beg to submit herewith, and to take the liberty of quoting therefrom as being the most reliable source of information open to me apart from personal observation.

We had a conversation about the springs, but the superintendent did not express any opinion on the question whether the leasing system should be continued or some other scheme devised, as he thought it would not be proper for him to do so while the subject was still under the consideration of the Government, in which I quite agreed with him; but he most kindly offered to assist me in obtaining as full information as possible from which to draw my own conclusions.

BATH HOUSES.

There are ten regular bath houses, and one free one, commonly called the "Mud Hole." Seven of these houses are situated at the base of the reservation mountain, facing south-west, and are named respectively, the "New Rector," "Big Iron," "Old Hale," "Independent," "New Palace," "Ozark," and "Rammelsberg."

I have visited all these bath houses and examined their plans, and find that while the same general idea has been followed in their construction, they vary somewhat in their internal arrangements.

The prevailing style of house is an oblong building, lighted from the top, and divided into one or two longitudinal tiers of compartments, according to the number of tubs.

Between this main building and the street are situated the ticket office, and the sweating and cooling rooms. The office is in the centre, and the male and female rooms on either side. The office also serves as a waiting room. Some houses keep their parlors warm in order that the sweating caused by the bath may be prolonged. From this warm room the bather may return to the waiting room, which is kept at a normal temperature, if unwilling to go straight from the sweating room to the outer air. Others, the newer houses, have both sweating and cooling rooms. The latter are a necessity for bathers who do not live near the bath house.

BATH BOXES.

The plans of the tub compartments differ slightly, but practically the same system obtains in all except the "New Rector," namely, division of the compartments into four sections, the two first being narrow passages between the corridor and the bath sections, for ingress and egress, and for undressing and dressing in. Behind the bath tub is the vapor box section.

I append a rough sketch (B), which will help to illustrate this description.

At the "New Rector" bath house some of the vapor boxes are placed in the corners of the tub apartments, in which also the bather makes his toilet. In some houses the four sections comprising the tub compartment are divided by close board walls; in others by open lattice, which latter plan has the advantage of enabling the ingoing bather to see that the tub is properly cleaned and refilled.

TUBS.

The greatest dissimilarity is apparent in the bath tubs. I have found all kinds and sizes, wood painted and unpainted, sheet iron, porcelain, zinc and slate. It is claimed for slate that it is a non-conductor, and that therefore the bather gets the benefit of the alleged electricity in the water. The enamelled porcelain appeared to me to be the cleanest, and I think is susceptible of a higher degree of cleanliness than any of the other materials, provided the enamel is of good quality. I am informed that inferior enamel is liable to crack and chip, in which case the tub becomes much deteriorated, if not entirely ruined.

DISTRIBUTION OF THE WATER.

There is no settled method of conducting the water to the bath houses. The usual plan is to arch a spring over with brick work and insert an iron pipe into the cavity from which water descends to the bath house where its distribution to the tubs is a simple matter of plumbing. Pipes also lead to the Government reservoirs, which have a united capacity of 50,000 gallons, and the natural pressure caused by the confinement of the springs at their outlet forces the surplus water into these reservoirs. Each bath house has also its own tank for holding cold water with which to regulate the temperature of the baths. These tanks are built on the hill side immediately in rear of the several houses.

Upon this subject of distribution of the water the ex-superintendent (Mr. Hamblen) in his report for the year ending 30th June, 1885, said: "The first and most neces-

sary improvement is to secure all the hot water and render it available for use. The present system of supply is the crudest possible, and to the disadvantage of both the Government and the consumer. A large part of the water formerly in use flows below the present grade of bath houses, as the buildings are now built from 8 to 12 feet above the former line. These waters now flow to waste. The method of supply is such a curious complication that the superintendent has little control over the water supply." From the above statement of Mr. Hamblen that the present system is the "crudest possible," and also such a "curious complication," that the superintendent has little control over the water supply," you will understand how difficult it is for me to give any better or more definite description of the method of distributing the hot water to the bath houses than to simply say that it is conducted in iron pipes from the spring nearest the house to be served, or from one of the reservoirs, where there is no spring available.

The average daily flow of the hot water is estimated at 500,000 gallons, of which according to Mr. Hamblen's report, above mentioned, about three fifths flows out below the grade line for buildings, and therefore runs to waste. A plan for collecting the waters from these low level springs and conducting them to a receiving reservoir from whence they were to be raised to a distributing reservoir on the mountain side, of sufficient elevation to make them available at all points where needed, was approved by the Department of the Interior, and the piping necessary for the purpose is laid.

The principal springs available, by reason of their elevation, are situated behind the "New Rector" and "Big Iron" bath houses, as will be seen from the plan of the reservation which accompanies General Field's report. Some of the houses further down the valley have to depend upon the Government reservoirs. The proprietors of these latter houses combat the theory that the water deteriorates by carriage.

I am informed by Dr. Keller, one of the leading physicians here, that whilst it is possible to drink these hot waters with impunity as they flow from the springs, if allowed to cool and be re-heated by artificial means they may cause nausea. I have not tried this experiment personally, but if that statement is correct, they must unquestionably lose some property by evaporation. It may be possible to convey them any distance without the loss of any material property, but I doubt it very much.

Before concluding the subject of distribution permit me to quote certain remarks made by General Field in his report of the 23rd September last, in which, speaking of the necessity for either renewing or reletting the existing bath houses, he says: "The plumbing in most of them is of an obsolete and imperfect kind, requiring an extravagant waste of hot water to make the vapors, which can only be changed to a better and more economical one at some cost." After urging the Secretary of the Interior to take this matter into his own hands, and not wait for the tardy action of Congress, he goes on to say: "Each bath house proprietor, from having had possibly some share in developing or securing certain springs, has been monopolizing them, and thinks his rights invaded if brought in question. The claim is not good, and will not be recognized, but from that cause, coupled with the possession of a site prolific in springs, some bath houses have a superabundance of water, whilst others, during a rush of bathers, have not enough. The problem of water distribution absorbs all others, and is the most difficult of solution because of the lack of uniform usage for its delivery. But it occurs to me that a fair adjustment can be reached by a regulation prescribing that all waters which, by gravity, will flow to bath houses, shall be delivered to them directly for hot vapor and tub use; that the water issuing below the level of the bath houses be lifted mechanically into the cooling tanks, that is, that the necessary cold water which is used in the proportion of at least one to one of hot, shall be drawn from the waste water at the foot of the mountain. In this way the springs at high elevation would be diminished by just the amount of cold water consumed."

The price charged for the water is \$15 rent per tub per annum, but as the capacity of the tubs varies greatly, and there is no means of knowing the quantity

flowing to any particular house, Mr. Hamblen recommended the use of meters and charging according to the quantity actually used. This suggestion, however, has not been concurred in by the present superintendent, who thinks the existing system simpler and better, but at the same time recommends an increase in the rental to \$3 per tub per month.

ANALYSIS.

It has considerably surprised me to learn that no proper analysis of these hot waters has yet been made. This appears to me to be a most unfortunate omission.

GENERAL REMARKS.

I have mentioned the apparent laxity of management: it would be more strictly accurate to say that there is no management at all. The owners of the houses are seldom seen about the premises; the clerk, who is sometimes a mere boy or young woman, only sells the tickets; and the invalid is turned over to the care of an utterly ignorant attendant. There is no attempt at classification of bathers, and consequently a person suffering only from rheumatism may enter a tub immediately after it has been vacated by some one afflicted with a contagious disease. It is true the possible danger from this unregulated bathing may be lessened or entirely avoided by strict cleanliness, but under the present system the bather has no assurance that such will be observed. Of course it is possible to watch the operation of cleaning the tub and to see that it is properly performed, but I observe that the majority of bathers pay no attention whatever to this precaution.

In this connection it has occurred to me that it might be possible to so construct a compartment that the out-going bather would empty the bath-tub in gaining access to the dressing room.

There are no swimming or gymnasium baths, so useful in certain cases, and no private baths for those able and willing to pay for the convenience and safety of having the exclusive use of one particular tub during their sojourn here.

The attendants receive no wages. They are allowed to collect a fee of a dollar a week from the bathers, and as much more as they can. Out of this revenue they provide the furniture of the bath-box, consisting usually of such requisites as chairs, mats, mirrors, scrubbing brushes, sand glasses, &c. (the bather furnishes his own towels). This system seems to me entirely wrong. It would be better that the owners of the houses should provide all necessary appliances and pay the attendants proper wages, even should they be obliged to charge a higher rate for bathing in consequence.

The present average rate is 30 cents, which includes a vapor as well as a tub bath, which may occupy any reasonable time—six minutes suffices for some, while others require an hour or more.

Some time ago the Secretary of the Interior authorized an increase to 50 cents, but this has not been taken advantage of so far. Possibly the present uncertainty as to the renewal of their leases may account for this modesty. I am sure that it does not arise from any consideration for the invalids. I do not see any reason why the prices should not be properly graduated. An article in a recent issue of the "*Hot Springs Daily News*," coincides so much with the views I have formed on this subject that I annex a copy of it (C) to this report.

The object of my visit being simply to report facts, it hardly comes within the scope of this letter to discuss the best mode of dealing with these waters, but before concluding I cannot refrain from expressing my conviction that absolute government control, and management under medical supervision, is the only solution of the question that will ensure the maximum of benefit to those sufferers requiring the aid of the Hot Springs of Arkansas.

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

JOHN R. HALL.

CERTIFIED COPY of a Report of a Committee of the Honorable the Privy Council,
approved by His Excellency the Governor General in Council on the 6th July,
1886.

The Committee of Council have had under consideration the accompanying memorandum, dated 30th June, 1886, from the Minister of the Interior, having reference to the settling of the best mode of dealing with the Hot Springs near Banff Station on the line of the Canadian Pacific Railway, and they concur in the second plan stated in the said memorandum, and advise that the Minister of the Interior be authorized to carry the same into effect.

JOHN J. MCGEE,
Clerk Privy Council.

To the Honorable
The Minister of the Interior.

DEPARTMENT OF THE INTERIOR,
OTTAWA, 30th June, 1886.

Memorandum.

The undersigned has the honor to report that by Order in Council of the 25th November, 1885, a reservation of certain sections of land, in the midst of which the Hot Springs near Banff Station, on the line of the Canadian Pacific Railway, are situated, was established in order that control of the lands surrounding the springs might remain vested in the Crown; and in his opinion the time has now arrived for considering and settling the best mode of dealing with those springs.

In determining the system on which mineral springs of such exceedingly valuable curative properties as are undoubtedly possessed by the springs at Banff, should be disposed of, the first consideration would seem to be, to secure to the public the utmost benefit which can be derived from the waters without loss to the revenue.

It is expected that a large number of people, both from Canada and the Northern States, will be attracted to the Banff Springs, not only by the virtues of the waters, but also by the beauty of the scenery and the excellence of the climate, and it is very important that the springs be managed from the beginning in the best possible manner.

In this connection the undersigned desires to call attention to the report of the Secretary of his Department on the way in which the bathing business is conducted at the celebrated Hot Springs of Arkansas.

From that report it appears that the district containing the most valuable springs has been made a Government reservation under the control of a resident superintendent; that the sites of bath houses on the reservation are leased to private parties who erect buildings thereon according to their own ideas of what a bath house should be, the plumbing in most being defective and obsolete, entailing a great waste of water; that the bath attendants are utterly ignorant, and the lessees exercise no proper supervision over their work; and that those most competent to form an opinion on the subject favor the assumption of the whole business by the Government as the best remedy for the existing state of affairs. In that view Mr. Hall concurred; but commencing as we do at Banff with a clean slate, it appears to the undersigned possible to adopt such regulations as would minimize the evils complained of at the Hot Springs of Arkansas, and with that object in view he begs to submit for the consideration of the Council the two following plans for dealing with these springs, which he thinks are the only ones at all practicable:—

1st. By building a bath house to be managed by a staff of attendants, under the supervision of a superintendent, who should be a properly qualified physician, and depending upon the receipts to cover the cost of management and leave a sufficient balance to pay a reasonable rate of interest on the capital account.

The advantages of this plan are that it would insure the absolute control of the waters by the Government, and the conduct of the bathing business in the most approved manner, which would probably prove an attraction to the numerous invalids who have little confidence in the conduct of such places by private enterprise. On the other hand, the erection of a bath house large enough to meet all probable requirements for the next 10 or 15 years, at a place where building is very expensive, would cost at least \$50,000, and even though the receipts might reasonably be expected to pay 4 per cent. on that amount, it is a question for Council to consider whether the expenditure of such a sum for this purpose is expedient at the present time.

2nd. By leasing to any parties willing to build and maintain bath houses the use of sufficient water for such bath houses at a fixed sum per tub per annum, as is done by the Government of the United States with the waters of the Hot Springs of Arkansas. This plan would obviate the necessity of any immediate expenditure, beyond the cost of laying out the National Park, and the undersigned is disposed to recommend its adoption on the following conditions, which, in his opinion, would enable the Department of the Interior to guard against the occurrence of the objectionable features of the leasing system existing at the Hot Springs of Arkansas, viz., that the Minister of the Interior shall have power—

(1.) To lease sites for bath houses, and the use of sufficient water for the purposes thereof, at a rent charge for the water of \$15 per tub per annum, such charge to cover also the rent of the building sites, which shall remain the property of the Government, on condition that the persons who obtain the leases shall each be required to build and maintain, within a period to be fixed by him for that purpose, a bath house which shall contain not less than 30 tubs, shall be on such architectural plan as he may approve, and shall be subject also, as to the material of the bath tubs and the plumbing, to the approval of the chief architect of the Government.

(2.) To make regulations for the conduct of the bathing business generally and to fix, from time to time, the amount which may be charged by the lessee for the baths.

(3.) To cancel any lease upon six months' notice for infraction of the regulations, and to dispose of the improvements on the site for the benefit of the lessee after defraying any expense incurred in connection with such cancellation and resumption of the site.

All of which is respectfully submitted.

THOS. WHITE,

Minister of the Interior.

The Honorable
The Privy Council.

MR. WHITCHER'S REPORT.

OTTAWA, 31st December, 1886.

Hon. THOMAS WHITE,
Minister of the Interior.

SIR,—Pursuant to instructions received from you to that effect, I have the honour to submit the following report on the kinds and condition of game and fish in the Canadian National Park, at Banff, N.W.T., and making certain suggestions as to the best means to protect and increase them.

AREA EXPLORED.

The superficies of the tract to be reserved as a Canadian National Park, on the easterly slope of the Rocky Mountains, not being determined at the time of present inquiry, it was assumed that an area, varying in length and breadth from fifteen to twenty-five miles would be comprised definitively within the outlines of the reservation. Although personal examinations in this connection were made within a radius of eighteen miles from the central datum at Banff, other observations and inquiries indicate that the distribution and the nature and actual state of game and fish throughout the supposed tract, as also beyond it, are much the same as elsewhere.

PRESENT CONDITION.

Large game and fish, once various and plenty in this mountainous region, are now scattered and comparatively scarce. Skin-hunters, dynamiters and netters, with Indians, wolves and foxes, have committed sad havoc. The rapid settlement now progressing in that vicinity will add other elements of destruction. Therefore, the necessity for promptness and efficiency becomes a vital urgency in the adoption of any scheme for saving and increasing what is left. How to avert irreparable disaster to the remnant of game and fish, to restore partial exhaustion, to restock the mountain uplands, valleys and plains, and to replenish the waters, is worthy of immediate and serious consideration.

Paucity of fish and game will undoubtedly deprive the National Park of something of its many wild attractions; whilst plenteousness will be a source of profit and pleasure to Canadians interested in its development as a free popular resort for health and recreation, as also to strangers attracted thither by the natural features of scenic beauty and hygienic excellence which it assuredly embodies in an eminent degree.

KINDS OF GAME AND FISH.

Beasts.—Foremost among the four-footed game is the wapiti deer, commonly called blue elk. It is a magnificent creature, admirably adapted by form and habits to the park-like woodlands which fringe the glades and cover the dark green slopes of the foothills country. These plains and plateaus, in some places traversed by streams and everywhere intersected by gullies, extend far up into the mountains where the wapiti resorts in winter. The young are produced in spring time, and with the parents inhabit the meadow ranges and river and lake bottoms throughout summer and autumn.

If the pursuit of elk was confined to the months of October, November and December, and restricted to the purpose of legitimate sport and domestic use, whilst the spring and summer months were legally defended and strictly guarded as a close time, this noble species might in a few years recover from the indiscriminate and wasteful hunting to which it has been exposed for some time past.

The lesser deer are more numerous. They consist of the varieties known as black tail or mule deer; white tail or jumping deer; common red or Virginian deer, and prong horn antelope. These cervidæ breed also in spring. The same rigid protection applied to them would most probably in two or three years restore them in considerable numbers.

Wary mountain sheep and stupid goats frequent the mountain tops in fragmentary bands, which the Indians have this season still further diminished. Unless quickly and vigorously protected, they cannot last much longer. The same close time and similar restrictions would cover the period of greatest exposure; and owing to the craggy nature of their habitat and their own timidity, a reasonable amount of hunting could not seriously interfere with gradual recruitment.

Bears are of three kinds: grizzly, cinnamon and black. They generally protect themselves. Not being habitually carnivorous, but rather vegetarian feeders, and finding ample food around the marshes and along the gulches and hill sides, they need not be wantonly killed nor dealt with as we should do with the lupine, vulpine and feline vermin that prey upon furred and feathered game with savage impartiality.

The foregoing are what may be, strictly speaking, considered as quadrupedal game not reckoned for trapping, nor accounted amongst noxious animals because of destructive habits or peculiar ferocity.

There are, of course, many other wild animals, such as beavers, otters, mink, fishers, muskrats, marten, badgers, marmots, squirrels, hares and rabbits; these with other smaller animals and countless innocent and gay plumaged birds it is extremely desirable to let alone for the present at least. They form part and parcel of living ornaments interesting to visitors on every public reservation. Whenever it may seem innocuous or expedient to utilize serviceable portions for their furs and skins, or for scientific objects, it can be done under proper supervision.

Wolves, coyotes, foxes, lynxes, skunks, weasels, wild cats, porcupines and badgers should be destroyed. But this should be done only under specific authority from the local Superintendent. The same may be said of eagles, falcons, owls, hawks and other inferior rapaces, if too numerous; including also piscivorous specimens, such as loons, mergansers, kingfishers and cormorants. Vultures, pelicans, buzzards, ravens and crows might remain for scavengers. Probably the readiest and fairest way of killing off noxious beasts and birds would be to impose the duty on responsible guardians employed by the Department. If the Superintendent thought necessary such employés could be assisted by volunteers.

Certain private individuals have signified their willingness to aid in starting a Museum of Natural History at Banff. In the event of such a project being realized the animal species weeded out could be utilized in a satisfactory manner. A competent taxidermist may find steady employment there. Were the Government to provide for a public museum and aquaria, as an interesting and instructive adjunct to some such educational institute or scientific observatory as must sooner or later be established in that healthful and inviting locality, various representative specimens could be obtained beforehand by fit persons instructed to do so.

Birds.—Feathered game consists chiefly of migratory and aquatic fowl. These have not suffered to the same extent as residential fauna, but the latter are alarmingly decreased. Apart from incessant shooting and other disturbance and injury attending railway construction, the constant passage through a narrow valley, hemmed in by echoing mountains, and skirting and crossing the water stretches with scarcely a sheltering break, would necessarily operate much more unfavourably in this respect than if the traffic were through open prairie or dense forest. Here it is difficult to escape from the rock-bound pass, unless existing small lakes and creeks can be enlarged and set back into the friendly shelter of those half-dried swamps and tangled gullies stretching for miles along both sides of the railroad. Further on are certain practical suggestions on this head.

Swans, geese and ducks are the principal winged game, of which there are several varieties, many of them breeding in that neighbourhood. The Bow River and Wapiti (Kicking Horse) valleys form one of the migration routes of wild fowl to and from the valley of the Columbia River. Snipes, plovers and curlews are still found. Herons, bitterns, loons, gulls, grebes, pelicans, cormorants, rails and coots also remain. In addition to the common birch and spruce partridges, there are blue grouse, ptarmigan, sharp-tailed grouse, rock grouse, sage cock and black-tailed grouse. These birds, like their aquatic neighbours, nest and hatch in spring and

summer time. They should not be hunted at all during the spring and summer months. The 1st of October is time enough to begin the open season. Similar regulations and the permissive system recommended for other game should be extended to them. Also, as regards all others of the numberless songsters and insectivorous birds that enliven and beautify the Park, but are not ranked as game, a strict guardianship should render it impossible for any person wantonly to disturb, injure or destroy them.

Fish.—The fishes comprise generally whitefish, mountain trout, lake trout, river trout, brook trout, herrings, silver and golden carp, catfish and suckers. It does not appear that jackfish, pickerel or perch exist in the immediate neighbourhood. They are said to frequent some outside waters further eastwards, which were not this season visited. The whitefish and lake trouts breed during October and November; the other trouts vary from spring to autumn; indeed, there are some of different kinds in spawn throughout the season. The best variety, known as rainbow trout, is undoubtedly a spring breeder. In March, April and May the spawn is either far advanced or ready for extrusion.

There is a remarkable confusion of trouts hereabouts that may be related to the former profusion. Of identified river trout the rainbow variety (*salmo irideus*) ranks originally in form, size, colour, flavor and gaminess; the brook trout (*salvelinus fontinalis*), though much smaller, ranks next; the Rocky Mountain brook trout (*salmo stellatus*) runs small, but is very lively and tasty; the largest river trout (*salmo purpuratus*) is heavy and dull, but is fairly eatable; a brownish trout, called "bull trout," seems to be a variation of *fontinalis*—an awkward country cousin and a hard fighter when hooked, but of insipid flesh. There has been so much interbreeding among these trouts that many others are found, and their aspect and flavor are affected by consequent irregularity of spawning condition. If like circumstances exist elsewhere, in the myriad waters flowing by circuitous routes through diversified strata and variable temperatures towards the South and North Saskatchewan, within the trout range, it is no wonder that so many persons express uncertain opinions and relate diverse experiences respecting the regular spawning seasons.

In the larger lakes the *salmo naymacush* predominates, and is logy and coarse fleshed, like *salmo ferox*. In the smaller lakes there is a trout answering in size, shape and markings to *salmo amethystus*, but not structurally differing from other lake trouts. Brook trout also occur in these small lakes. The Rocky Mountain whitefish, and the so-called mountain herring, are true *coregoni*, and what is locally named grayling appears to be but another variety of the stream whitefish, which is rounder in form and far smaller in size than its lake congener. Probably the dorsal fin of an Arctic char, which there is reason to think inhabits some mountain tarns in the Rockies, has caused this attibawmeg to be confounded with thymalloids. I captured several lake trouts, large and small, from the stomachs of which were taken young whitefish, herrings and trout, but no graylings.

The above particulars are stated in support of a recommendation to generalise close seasons rather than as data relating to species and variations, which in these north-western wilds develop strange perplexities.

Were angling for every description of trout allowed in June, July, August, September, and fishing restricted to hook and line, solely for sport and private use, the regulation would be safe and effectual, but the present stock would require to be supplemented by an adequate plant of young trout and adults from other quarters.

Herrings, carp, suckers and whitefish feed largely on the eggs of trout and whitefish, but as these in their turn devour the ova and fry of the others, the economic score is, on the whole, pretty evenly balanced.

Nothing else but the ravages of giant powder, nets, and the improvidence of Indian fishing, can adequately account for the decimation of fluvial trout in these waters. The curse of wastefulness has fallen heaviest on the mountain variety inhabiting the smaller streams, and the rainbow trout which frequented the eddies and transparent pools of Bow River and its sparkling tributaries. The lacustrine

varieties have dwindled mostly where their spawning-beds were exposed by shallows, or were situated near the inlets and outlets of streams and creeks.

RECOMMENDATIONS TO PROTECT AND CULTIVATE GAME AND FISH.

Many years of experience have failed to discover more promising and inexpensive facilities to establish and maintain a pattern nursery for hatching and rearing aquatic birds and sporting fishes, than are presented in the environs of Banff. They were examined critically, and considered from every practical and economical point of view. I am firmly convinced of the entire practicability and the simplicity of beneficial operations, and also of the extreme desirability of improving these natural advantages to the fullest possible extent. Besides adopting prohibitory regulations, referred to generally in the preceding report, and further specified hereafter in form of recapitulation, I would suggest as follows:—

1. Extending westwards from inside the junction of Forty-Mile Creek with Bow River, for about four miles on the north side of the railway track, and along the base of the foot-hills is a succession of small lakes and ponds, with connecting channels, that anciently formed part of the Bow River basin. The meadows in which these ancient lakes and "leads" occur, are filled with coarse and tall grasses, peaty tufts, bunches of marsh willows, with insulated clumps of swamp alders and dwarf evergreens and fringes of reeds and rushes. These low covers are peculiarly fitted for the nesting and rearing of water fowl, as the young broods could always find safe shelter amongst the weeds and thick grass from their worst enemies, the kit foxes and prairie wolves. Here and there a woody spit partially divides the pools and water-courses from each other, and separates both from the river's edge. The sub-soil consists of black muck, inlaid with patches of sulphurous sediment, from which bubble springs of different temperatures. This soil is adapted to the growth of wild rice. A short dam, about 4 feet high, with perforated grating along the crest, should be built across the narrow creek which empties these waters into the Forty-Mile Creek, and the whole flat should be sown with wild rice seed. The grain would grow luxuriantly and supplant much of the rank weeds and wiry grasses now covering unflooded portions. Besides being a healthy vegetation, self-seeding and strengthening as it spreads, the rice plant offers food and concealment to wild geese and ducks, and at the same time will make a cleaner and more extensive area in which to cultivate superior kinds of fish, with which its waters should be freely stocked. It is a very hardy plant, and the seeds would be carried by aquatic birds to other and distant places for 20 miles around, and would vegetate as regularly as if sowed by hand. If a wire screen was also run across the bed of Forty-Mile Creek, where it passes underneath the railroad, the whole extent of that transparent and deliciously cool water, away up to its sources on the western side of Cascades Mountain, would be an admirable resort and capital angling place for the best kinds of trout.

2. Corresponding conditions exist on the southerly side of Bow River, and extend from below the Cave Spring upwards, about six miles, to the mouth of Sun Dance River. Just above the mouth of this stream at a sharp elbow, there is a small rocky island that would form natural abutments for a miniature wing dam to deflect a part of the stream and spread it into these old marshes in which there is abundant and proper soil for growing wild rice. Here also would be a suitable and very extensive area in which to raise and attract aquatic wild fowl, and to harbour and nourish different kinds of fish. The overflow can be easily regulated by a rough dam with double gate and wired slide at the mouth of Cold Water Creek, about equi-distant between the two extremities.

3. Both of these enclosures, supplemental to the surface space of Bow River, would be invaluable as a fire-break against any conflagration from the west. They would converge, as it were, towards the curve of the valley where the mountains on either side close down into a narrow gap, through which occasional winds from that quarter blow strongly. Without some such effective break any fire under headway

from the westward must inevitably consume the fallen and standing timber, and all the tangled undergrowth, west of Banff, and also imperil the railway. It would creep up the timbered gullies and overspread the mountain slopes. Indeed, the entire settlement down to Tunnel Hill would be endangered. A windy fire might altogether defy subduing, and would certainly disfigure and probably destroy the finest and most useful portions of natural scenery in the very heart of the National Park. The trifling expenditure therefore necessary to carry out this three-fold suggestion would seem to be especially judicious. It might save the cost of watching and avert risks to valuable properties. Provision against such contingencies is apt to be deferred. Let this case be an exception. Danger is imminent and precaution urgent.

4. The gradual recession of the river banks from the lower slopes of the mountains bordering the Bow River Valley has left successive tiers of fallen timber that is now imbedded in the loose soil or entangled in the scrub and second growth. This mass of debris is matted amongst the grasses, where the seasoned and resinous roots and branches form a supply of inflammable material for any fire that may be kindled accidentally or otherwise along the Bow River or upon the hillsides between Banff Falls and the great bend east of Castle Mountain. The fact that this and adjoining sections are covered by existing timber licenses renders it all the more dangerous should lumbering operations be carried on while it is in its present condition.

This submerging of the old meadows, besides incidentally guarding against fires, will drown out the predaceous animals which now infest them.

5. If, after thus reflooding, any cultivable hay fields are left, they should be placed entirely at the disposal of the Superintendent; and no permits to cut hay should be issued until the effect of damming has been tried, and even then they should be made revocable at will, as otherwise claims for damages may ensue. This plan would obviate the possibility of removing grass plots or timber that is more serviceable for other purposes connected with seeding rice and raising game and fish, and also to decrease the risk of fire. There are other large flats and clean hay meadows as yet undisfigured by fire or littered with fallen trees or driftwood, and dotted with living groves of pines, balsams and tamarack, on both sides of Bow River, below the Banff Falls.

6. There are two medium-sized streams and three small brooks running through the tract of partially wooded land situated between the south easterly bend of Forty-Mile Creek, on the tract of land on which the Banff railway station is built. A thick covert of alders borders three of these watercourses. All of them should be improved by alternate pools and rapids made by means of rude dams, and the whole well stocked with speckled trout. If carefully underbrushed and tastily improved in this manner, the entire flat would become both useful and ornamental. The Government highway passes through it from the railroad station to the town of Banff, and over the bridge across Bow River to the Hot Springs.

7. A short dam about five or six feet high should be built across Devil's Head Creek, at its junction with Cascades River, so as to set back the outflow from Devil's Head Lake into the old sloughs and boggy depressions that extend in a semi-circle in a south-westerly direction from the outlet of the lake round to the south side of the rocky canyon on Cascades River. This enclosure should also be seeded down with wild rice. Wild geese and ducks in great numbers congregate around the east end of the lake on their migrations southward. They would linger every autumn about these enlarged ponds if sufficient water and food existed. It will convert an extensive waste of beaver meadow into a pretty group of small lakes, well suited to the cultivation of fish and water-fowl. The deep and clear watered creek that flows around the north side of this flat is peculiarly fitted for rearing trout. Besides, the open water would be an admirable place for boating at times when the lake is rough. This creek may be filled with fish, and it would afford good angling. I caught in it, with a fly, this season, a fine rainbow trout weighing six and a quarter pounds. It was the handsomest fish I ever saw, and bore such a close resemblance in its exquisite

form to the smallish salmon of the Pacific coast that had it been taken west of the Selkirk range it could scarcely have been distinguished from its more aristocratic relative. The creek can be easily shut off from the lake so as to exclude the voracious trouts, and breed in it exclusively the mountain varieties, which could be liberated occasionally into Cascades River to replenish that beautiful stream.

I also captured with trolling tackle three specimens of trout in the main lake. One of the males weighing twelve pounds had swallowed a herring, two whitefish and a young trout. The ovaries of the female contained 3,860 ripe eggs. The male was in full melt. Protection during the spawning time and licensed fishing only for domestic use, with hook and line, would recuperate this exhausted fishery.

Devil's Head Lake is an extensive body of clear, cold and deep water, about nine miles long and two miles wide. Its shores are indented on both sides with coves and bays where fish find shelter and food. Small streams empty into some of these bays. Shoals and gravelly inlets are numerous, where it is evident that trout feed and breed. The common trout of the larger mountain lakes once abounded in this lake. There is still a fair breeding stock left. They should be protected and multiplied, as the lake will unquestionably form a powerful attraction to visitors, and will eventually become a very popular summer resort for families. In addition to an abundance of fish for home use and for sport, the pleasures of boating will be largely enjoyed. Steam yachts will surely be placed thereon, and hotels and boarding houses, and perhaps private cottages, will soon occupy the picturesque shores. Every inducement should be offered to sojourners and strangers, as the mountain scenery is magnificent, and the situation is romantic and salubrious. An excellent road line leading from the Springs to Devil's Head Lake passes through the Valley of Cascades River, ascending gently along the ridges to reach the elevated basin of this lake. The distance is about seven miles. Running eastwards from the upper end of the lake is a well defined and thickly timbered valley, skirted by steep mountains, in which several small lakes are separated from each other by dry ridges covered with white poplars and firs. The water in these lakes is beautifully clear, being supplied by springs and rivulets from the mountain clefts. I found no fish in them; but they could be readily stocked with young trout. This wide pass joins the two valleys of Devil's Head Lake and Ghost River, and is famous in Indian tradition as the winter haunt of large game.

9. Trout culture in all of these waters should be practised on a large scale. The true rainbow variety merits special attention. Its external appearance, and its sporting and eatable qualities, are very superior. It is also a hardy and prolific fish. It feeds greedily and grows rapidly—attaining the weight of four or five pounds in three years. It has been cultivated by artificial methods in immense numbers in the United States, and has thrived in nearly every water into which it has been transplanted. Adults and fry bear transportation better than any other salmonoids. The ova and fry were procured from California streams where the fish of the western is identical with that of the eastern slope of the Rocky Mountains. There are quite a number of places along the line of the Canadian Pacific Railroad where stock fish can be taken, and which are conveniently situated for shipping them alive. The improved water stretches at Banff, and also the lower bend of Cascades River, being right alongside of the railroad dump, the live fish can be handily unloaded into their new habitation. The same tanks might be used to convey other living fishes, such as the small growth salmon from Harrison River, and the red fleshed trout (*salmo Gairdneri*) of the tidal estuaries in British Columbia.

10. Should it be thought advisable to transplant pheasants and quails from Vancouver Island into the National Park, it could readily be done. Quails were introduced into the island a few years since from California, and are now abundant. Pheasants were also imported from England and have thriven well. There is no reason why both quails and pheasants should not prosper in the tempered climate and sheltered valley in which Banff is situated. Food is plenty, and if coyotes and foxes are extirpated there is nothing to prevent these birds from increasing.

11. On the 2nd of September, last, in an advance report, I had the honor to offer certain urgent suggestions which received prompt and gratifying approval. These were, in effect, to instruct Mr. Stewart provisionally, to prevent all shooting and trapping, hunting and fishing, within the projected limits, excepting for sport and immediate domestic use, and not for selling or bartering, and also to restrict angling to rod and line. It was further suggested that a brushwood and gravel dam should be thrown at once across the outlet from Vermillion Lakes, so as to retain the water then fast lowering; and to procure and sow with all possible despatch about twenty-five bushels of wild rice from Rice Lake, Ont., around the ponds and along the channels north of the railway on the west side of Forty-Mile Creek. This suggestion was quickly carried out by the Department so far as procuring and forwarding the rice seed was concerned; but owing to delays in transmission by rail, the grain did not reach the Superintendent at Banff in time for seeding before the ice formed. The miscarriage is regrettable, because the then prevailing drought put these places into a most suitable state for flooding and sowing. The experiment of sowing next spring is worthy of trial. I am, however, unaware if Mr. Stewart has prepared the meadows by building the dam as suggested. In any case I beg to recommend the timely purchase of at least 125 bushels more from last fall's crop to be ready for seeding next season. On this point I have already written and sent a separate letter.

12. Hunting, fishing, shooting and trapping should be forbidden, under penalty and confiscation of articles and implements, excepting under written authority granted by the Park Superintendent, and countersigned by the chief police officer or head guardian stationed in the reserve.

The Superintendent should be vested with discretionary power, in granting such permission, in order that he may judge of the *bona fides* of applicants; he might also be instructed to exact license fees. These licenses should be issued for given dates during the open seasons, and solely for reasonable sport, limiting the produce to immediate personal or domestic use, and inhibiting the sale or barter thereof. They should not be transferable. Such conditions being embodied in the licenses, any wilful breach or omission should forfeit the privilege and disqualify the holder.

Amongst the rules sanctioned by the U. S. Congress, for the governance of the Yellowstone National Park, no allowance whatsoever is made for sporting, beyond the mere permission to angle for amusement and actual consumption. I think it inadvisable to deny rational freedom in this particular within the boundaries of the Canadian reservation, because it is quite controllable and it will remove every appearance of exclusive preservation from the protective measures to be rigidly enforced. It should thereby ensure public sympathy as a moral and material support to those officers charged with the duties of supervision and guardianship. It should be, at the same time, clearly understood that the circumstances would justify complete denial of all such sporting privileges inside of the Park, because its configuration and moderate dimensions leave open to sport, during legal seasons, a large extent of country on every side of its outskirts, where game will multiply apace and become again plentiful.

Exceptions of no kind whatever should be made in favor of Indians. Those who now invade that territory are stragglers and deserters from their own reserves, where they are well cared for in food and clothing at the public expense. Any misplaced indulgence could only serve to entice them away from their settled homes and tempt them to frequent and traffic meat (venison, goat and wild mutton), furs, hides and horns at the inhabited places about the town of Banff, the mines, the springs and the railway station, with all the attendant demoralization so fatal to aborigines. I would, however, suggest that if it can be shown that the bands of Stonies, from Morley—which is the only Indian reserve in that region, and the members might be distinguished from outsiders and strangers—have depended in some measure on hunting, fishing or trapping over the reserved tract, to eke out their means of subsistence, the difference should be made up to them by equivalent rations or other allowances.

13. With efficient police at Banff to maintain order and enforce general laws and regulations and to uphold special measures, and with forest rangers and active assistants qualified by mountain experience and familiarity with animal habits and haunts, of which force picked Indians would form a part, there should be no difficulty in securing the Park against injury and intrusion, and in enforcing the strictest protection for fish and game still inhabiting it.

14. Unappropriated outskirts will in due time be more or less contributory to the main purpose of seclusion so far as the *feræ naturæ* are concerned. The tendency of animal existence will naturally be towards the sheltered and protected central conservatory, especially during periods of reproduction. But it may be safely affirmed, more particularly as regards all migratory species, that there will be no limit to the circumference within which the future abundance and perpetuity of every description of native wild beasts, birds and even fishes, must be effected most beneficially by the natural characteristics of this appropriation, and by the legislative measures and artificial methods applied to the cultivation and control of its fauna. With this prospect in mind I have felt the more confidence in recommending certain specialties that might otherwise appear to be somewhat fanciful or experimental for the especial benefit of a locality devoted in a chief measure to the pursuits of pleasure rather than to those substantial objects of proven usefulness for which the public funds are ordinarily expended. There are, nevertheless, recreative and attractive features about the prevalence of edible game in every new country that become in fact of the highest and most profitable utility, and which the progress of settlement and the growth of trade serve greatly to enhance. But it is unfortunately the case that no persons besides naturalists and sportsmen seem to appreciate the intrinsic worth of the feral stock until increasing waste outstrips reproductive capacity, and remedial aids fail for all time of effectual restoration. I would fain hope that an exceptional state of things may be inaugurated in this connection, and that by precautionary outlay on a liberal and enterprising scale the remnant of game and fish still existing may be speedily saved and abundantly increased. The Canadian National Park would then be regarded for this, among other praiseworthy reasons, as a model reserve, exemplifying the public spirit, the wise foresight and the progressive views of modern Canadians.

15. The whole of the foregoing suggestions are offered, and the recommendations are submitted in the earnest belief that what is worth doing at all is worth doing well, and that the National Park of Canada, at Banff Hot Springs, is deserving of every attention and justifies an unstinted outlay.

I have the honor to be, Sir,

Your obedient servant,

W. F. WHITCHER.

No. 7.

DEPARTMENT OF THE INTERIOR,
ORDNANCE AND ADMIRALTY LANDS BRANCH,
OTTAWA, 31st December, 1886.

SIR,—I have the honor to submit, for the information of the Minister of the Interior, a report of the transactions of this branch for the fiscal year ended 30th June, 1886.

Upon reference to the three schedules annexed, marked respectively A, B and C, it will be seen that the receipts for the year exceeded those of the year ended 30th June, 1885, and that upon the whole the transactions in connection with the Ordnance and Admiralty lands have been of a very satisfactory nature.

(A.) Summary of sales made during the year. In the City of Kingston 41 lots, comprising an area of 14 acres, were sold for \$14,299, of which sum \$3,487.80 was paid down at time of sale. The prices for which these lots were sold gives an average of \$1,021.35 per acre. In the Township of Tay a lot of 28 acres in area was sold for \$210 cash, being at the rate of \$7.50 per acre. A lot on Strachan Avenue, in the City of Toronto, having a frontage of 50 feet, was sold for \$1,250 cash (\$25 per lineal foot). "Isle Ronde," area 146 acres and 2 roods, and part of "Isle de Grace," 14 acres and 2 roods, situated in the River St. Lawrence, nearly opposite the Town of Sorel, were sold respectively for \$9,669 (\$66 per acre) and \$319 (\$22 per acre), one-fifth of the purchase money being paid down at the time of sale. Lot O, at the point on the west side of the River Richelieu opposite Sorel, containing 6 acres, was commuted on payment of the sum of \$352.73 (or \$58.79 per acre). In the City of Ottawa 4 lots and a half lot, comprising an area of 1 acre, 3 roods and 19 perches, were sold for \$1,805 (or at the rate of \$965.83 per acre). One-fifth of the purchase money was paid down at the time of sale. In the same city 16 lots, hitherto held under lease, were, by the payment of \$3,339.13, made by the respective lessees, converted into freehold, in accordance with the terms and conditions of the original leases granted by the principal officers of Her Majesty's Ordnance. In the Township of Nepean a small piece of land, 3 roods and 19½ perches in extent, was sold for \$109.18 cash; and at Grand Falls, Victoria County, New Brunswick, 23 lots, area 136 acres and 14 perches, were sold for \$827 (\$6.08 per acre), one-fourth (\$206.75) of the purchase money being paid down at the time of sale.

(B.) Statement showing the several localities on account of which moneys have been received.

(C.) Statement showing the amount received (monthly) during the fiscal year, aggregate \$26,349.86, as against \$24,540.61 received during the previous year, being an increase of \$1,809.25.

Certain discrepancies having been discovered in a plan of survey of a gore of unconceded land of about 107 arpents in extent, lying between the rear of the 2nd Concession, South Richelieu and Ruisseau Rhimbeault, in the Seigniorship of Sorel, prepared by R. S. L. Hayden, P. L. S., dated January, 1880, it was found necessary, in order that Letters Patent might be prepared in favor of the several purchasers to whom the subdivisions of the said gore had been sold, to have the same re-surveyed and accurately described. This service was entrusted to and carried out satisfactorily to completion in the month of July last, by Mr. Rauscher, of this Department, P. L. Surveyor, who was at the same time instructed to survey the gore of unconceded land lying between Concession Rhimbeault and Concession North, 1st River, Pot au Beurre, in the Parish of St. Victoire, comprising an area of about 357 arpents, and to sub-divide the same so as to allot to each of the proprietors in front the "continuation" of his holding. On the completion of this survey, the

several parties interested were advised that they would be permitted to acquire the strips of Ordnance land forming the "continuations" of their respective holdings, at the price of \$2 per arpent, in addition to the payment of a fair proportion of the cost of survey. Of the 31 portions into which the gore has been divided, 12, comprising an area of 99 arpents and 89 perches, have, since the close of the fiscal year, been paid for in full. Previous to apportioning the "continuations," the strictest investigation was made into the several claims to consideration advanced by the proprietors living immediately in front of, or in close proximity to, the said strips of land, and, so far as I have had an opportunity of judging, the means taken to arrive at a just and equitable decision in each case have been such as to justify approval.

In January last a re-valuation was made of the lots situated in the Town of Amherstburg, the sales of which were, in consequence of the non-payment of the heavy arrears due to this Department, cancelled some time since. It is proposed to offer these lots for sale at an early date, the up-set price in each case to be based upon the said valuation.

In the early part of the month of April the Ordnance property, known as the "Old Hugh House," a substantial stone building, situated on the bank of the River St. Lawrence, at Longueuil, held at the time by Mr. John Dillon, of Montreal, under a lease from this Department, was partially destroyed by the action of the ice forced against the building during the prevalence of the serious flood of that date, and rendered uninhabitable. To repair the damage done would, it has been roughly estimated, involve an outlay of from \$600 to \$800. I respectfully submit that it would be more profitable to sell the building and about three roods of land attached to it, than to incur the expense of repairing with a view to re-leasing it.

I am pleased to be in a position to state that the receipts on account of Ordnance lands for the five months ended 30th November, exceed those of the corresponding five months of last year by \$4,611.51. There are a large number of vacant lots situated in sundry localities, to wit, in the City of Ottawa, Kingston, Amherstburg, Fort Erie, Prescott, Sorel, Chambly and Quebec, the sales of which, at a convenient season, will be the means of very considerably increasing the revenue of this branch.

The two valuable mill-sites and water-powers situated at Coteau du Lac and the "Cascades," referred to in my report of last year, remain unleased. A part of the water-power at the place first mentioned has been rented temporarily.

During the year 720 letters were received, 853 letters written, and upwards of 300 notices and statements of accounts prepared and forwarded to tenants and purchasers in arrears. Sixty-two assignments were registered, 53 drafts of letters patent prepared, and 5 leases made out. About 1,100 accounts open with the respective purchasers and tenants of Ordnance lands situated in the Provinces of Ontario, Quebec, Nova Scotia and New Brunswick, have been carefully kept in this office.

In addition to the transactions to which I have already specially referred, there are many others, although of minor importance, equally deserving of notice, which might be mentioned as bearing witness to the application and attention of the clerks engaged in this branch, and it will, I think, be admitted that the work has been sufficiently heavy to tax to the utmost the capabilities of its limited staff, consisting of the officer in charge, a general clerk and a temporary clerk.

I have the honor to be, Sir,

Your obedient servant,

WILLIAM MILLS,

In Charge of Ordnance and Admiralty Lands.

A. M. BURGESS, Esq.,

Deputy of the Minister of the Interior,
Ottawa.

A.

STATEMENT of Sales made during the Fiscal Year ended 30th June, 1886.

Locality.	Number of Lots Sold or Redeemed.	Amount Sold for.	Amount received on Account.
		\$ cts.	\$ cts.
Grand Falls, N. B.	23	827 00	206 75
Kingston, City of	41	14,299 00	3,487 80
Ottawa do	16	3,339 13	3,339 13
do do	41	1,805 00	361 00
Nepean	3 r. 19 $\frac{1}{2}$ p.	109 18	109 18
Sorel	167 a.	10,340 73	2,336 43
Tay	28 a.	210 00	210 00
Toronto	1	1,250 00	1,250 00
	a. r. p. 195 3 19 $\frac{1}{2}$ and 85 $\frac{1}{2}$ lots.	32,180 04	11,300 29

WILLIAM MILLS,

In charge of Ordnance and Admiralty Lands.

DEPARTMENT OF THE INTERIOR,
ORDNANCE AND ADMIRALTY LANDS BRANCH,
OTTAWA, 31st December, 1886.

B.

STATEMENT showing the several Localities on account of which moneys have been received during the Fiscal Year ended 30th June, 1886.

Locality.	Amount.	Locality.	Amount.
	\$ cts.		\$ cts.
Amherstburg	4 00	Brought forward	20,880 46
Chambly	638 72	Pittsburg	10 00
Elmsley	19 40	Prescott	14 00
Fort Erie	37 50	Point Pelee	400 00
Kingston	10,866 81	Point Lévis	7 00
Longueuil	226 00	Sorel	3,364 43
Montreal	923 00	Sarnia	40 00
Nepean	109 18	Toronto	1,340 34
Nova Scotia	0 25	Tay	210 00
Niagara	293 86	Wolford	43 43
New Brunswick	377 02	Registration fees	40 20
Ottawa	7,384 72		
Carried forward	20,880 46		26,349 86

WILLIAM MILLS,

In charge of Ordnance and Admiralty Lands.

DEPARTMENT OF THE INTERIOR,
ORDNANCE AND ADMIRALTY LANDS BRANCH,
OTTAWA, 31st December, 1886.

[PART I]

C.

STATEMENT of Receipts on account of Ordnance and Admiralty Lands for the Fiscal Year ended 30th June, 1886.

Date.	Receipts.	Registration Fees.	R nt Interest.	Principal.	Total Amount.
1885.		\$ cts	\$ cts.	\$ cts.	\$ cts.
July	To receipts for month ....	.....	594 11	.....	594 11
August.....	do .....	.....	79 12	486 16	565 28
September.....	do .....	.....	301 81	1,434 00	1,735 81
October	do	19 00	805 17	2,186 90	3,011 07
November	do .....	.....	925 97	876 48	1,802 45
December	do	10 00	778 78	244 16	1,032 92
1886.					
January.....	do .....	.....	500 13	1,750 00	2,250 13
February	do .....	.....	1,133 56	1,065 42	2,198 98
March.....	.....	11 20	594 52	987 59	1,593 31
April	do .....	.....	485 20	483 77	968 97
May.....	do .....	.....	1,101 81	7,818 05	8,919 86
June	do .....	.....	944 65	732 32	1,676 97
		40 20	8,244 81	18,064 85	26,349 86

WILLIAM MILLS,

In charge of Ordnance and Admiralty Lands.

DEPARTMENT OF THE INTERIOR,
ORDNANCE AND ADMIRALTY LANDS BRANCH,
OTTAWA, 31st December, 1886.

No. 8.

DEPARTMENT OF THE INTERIOR,
ACCOUNTANT'S BRANCH,
OTTAWA, 26th January, 1887.

SIR,—I have the honor to submit the following report referring to the accounts of this Department for the year ending 31st October, 1886 :—

The ordinary business of this branch has steadily increased with the general work of the Department; 40,000 entries were made in our account books during the year; a corresponding increase has also taken place in the number of statements, reports, &c., furnished by this office.

It is unnecessary for me to mention the labor and time required to prepare scrip notes issued for Manitoba and North-West half-breeds, original white settlers, also the military bounty scrip authorized by Act of Parliament under Cap. 73, 48-49 Victoria. A complete record of scrip issued, redeemed and accepted in payment of dues to this Department, is kept in this office.

Scrip notes issued for land to be located by half-breeds	102
do for original white settlers and Manitoba and North-West half-breeds.....	2,537
do for military bounty.	4,394
Total do during the year....	7,033
Representing a sum exceeding	<u>\$735,000</u>

The receipts for sale and rent of Ordnance Lands have been, for the Departmental year, \$27,206.16.

Hereto annexed you will find a detailed statement of receipts on account of Dominion Lands, showing the monthly revenue from all sources for the twelve months ending 31st October, 1886.

Gross revenue in cash.....	\$262,032 86
Scrip redeemed and warrants located.....	343,843 46
Total	<u>\$605,876 32</u>

The above shows an increase of \$185,803.80 over the receipts of the year 1885.

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

J. A. PINARD,
Accountant.

A. M. BURGESS, Esq.,
Deputy Minister of the Interior,
Ottawa.

150 STATEMENT of Receipts on account of Dominion Lands, for the Year commencing 1st November, 1885, and ending 31st October, 1886.

Month.	Homestead Fees.	Pre-emptions.	Improvements.	General Sales of Lands.	Timber Dues.	Rents from Grazing Lands.	Rents from Coal Lands.	Royalty from Stone Quarries, Hay per- mits, Mining Fees, etc.	Map Sales, Office and Registration Fees.	Interchange of En- tries, Inspection Fees, &c.	Surveyors' Examina- tion Fees.	Miscellaneous.	Total.
1885.	\$	\$ cts.	\$ cts.	\$	\$ cts.	\$	\$ cts.	\$ cts.	\$	\$ cts.	\$ cts.	\$ cts.	\$ cts.
November	1,610 00	900 00	59 00	4,251 91	4,603 91	1,077 81	.....	72 16	69 00	240 00	85 70	.....	12,989 49
December	1,740 00	1,030 00	163 75	10,679 74	1,164 13	1,418 36	.....	34 45	60 00	410 00	.....	.....	16,700 43
1886.													
January	1,750 00	920 00	29 50	4,957 11	2,147 51	1,950 40	.....	78 05	35 42	300 00	.....	5 00	12,172 99
February	840 00	460 00	4 60	5,353 83	11,713 70	1,408 27	.....	159 00	82 61	220 00	.....	50 00	21,321 41
March	1,330 00	730 00	84 00	6,502 93	2,868 29	5,181 50	.....	29 95	46 00	220 00	.....	15 00	17,016 67
April	2,010 00	1,045 00	117 00	4,200 94	6,155 74	6,157 68	.....	92 40	633 70	530 00	.....	.....	19,912 46
May	2,790 00	1,690 00	85 00	5,330 93	10,851 84	2,155 75	40 00	89 00	189 36	610 00	.....	20,000 00	43,731 88
June	4,460 00	2,248 00	174 00	6,432 01	4,822 00	3,871 85	.....	216 27	110 50	1,050 00	270 00	.....	23,732 63
July	1,187 56	490 00	157 00	1,325 71	2,362 26	1,226 60	.....	143 10	11 50	902 91	.....	.....	7,806 67
August	1,480 15	1,010 00	84 80	3,609 48	10,832 96	1,108 08	.....	333 65	40 25	907 06	30 00	21,700 00	41,166 13
September	2,190 00	860 00	184 30	4,085 40	4,964 91	994 42	.....	72 05	64 00	710 00	.....	2,416 40	16,541 18
October	1,982 29	450 00	113 50	5,996 03	9,440 45	170 00	.....	121 15	43 50	630 00	.....	10,000 00	28,946 92
Scrip and Warrants	23,370 00	1,761 00	1,255 21	63,816 02	70,927 70	26,723 72	40 00	1,441 23	1,385 84	\$740 00	385 70	54,186 40	161,032 86
Totals .....	.....	.....	.....	32,150 17	.....	20,613 29	.....	80 00	.....	.....	.....	.....	343,843 46
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	605,876 32

J. A. PINARD,
Accountant.

DEPARTMENT OF THE INTERIOR,
OTTAWA, 17th December, 1886.

APPENDIX A.

STATEMENT of Entries affecting Dominion Lands which were made during the Year commencing 1st November, 1885, and ending 31st October, 1886, at the Head Office and the Agencies of the several undermentioned Colonization Companies.

Office.	Homesteads.		Pre-emptions		Hudson Bay Co.		Special Grants		O. P. Railway.		Total Entries.	
	No.	Area in Acres.	No.	Area in Acres.	No.	Area in Acres.	No.	Area in Acres.	No.	Area in Acres.	No.	Area in Acres.
Head Office at Ottawa.	7	1,120	2	320	26	106,693	66	10,141	187	122,504	279	239,338
Shell River Colonization Co.	4	640	2	320	.....	.....	.....	.....	.....	.....	9	1,440
Touchwood and Qu'Appelle Colonization Co.	19	3,420	4	640	.....	.....	.....	.....	.....	.....	6	960
Scottish, Ontario and Manitoba Land Co.	6	960	3	480	.....	.....	.....	.....	.....	.....	23	4,060
Montreal and Western Land Company	3	480	3	480	.....	.....	.....	.....	.....	.....	9	1,440
York Farmers' Colonization Co.	7	1,280	4	640	.....	.....	.....	.....	.....	.....	6	960
Temperance do	22	3,520	3	480	.....	.....	.....	.....	.....	.....	11	1,920
Dominion Land do	6	1,120	4	640	.....	.....	.....	.....	.....	.....	25	4,000
Qu'Appelle Land do	7	1,120	6	960	.....	.....	.....	.....	.....	.....	10	1,760
Primitive Methodist do	3	480	1	160	.....	.....	.....	.....	.....	.....	13	2,080
Edmonton and Saskatchewan Land Co	1	160	1	160	.....	.....	.....	.....	.....	.....	4	640
Fertile Belt Colonization Co .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	320
Total	85	14,300	33	5,280	26	106,693	66	10,141	187	122,504	397	259,918

WM. M. GOODEVE,
Chief Clerk, Patent Branch.

DEPARTMENT OF THE INTERIOR,
PATENT BRANCH, OTTAWA, 1886.

APPENDIX B.

ABSTRACT of Letters Patent issued from the Department of the Interior, covering Lands in Manitoba, the North-West Territories, and the Island of Vancouver, between the 1st November, 1885, and the 31st October, 1886.

No.	Nature of Grants.	1885-1886.		1884-1885.	
		Number of Patents.	Area in Acres.	Number of Patents.	Area in Acres.
1	Homesteads.....	2,913	466,876	1,713	272,636
2	Sales	886	146,988	884	166,765
3	Half-breed allotments	185	44,400	108	25,920
4	Grants under Manitoba Act.....	82	7,864	336	38,606
5	Grants in commutation of right of common, &c.	89	6,983	237	18,947
6	Special grants	66	10,141	21	3,149
7	Hudson Bay Company grants.....	26	106,693	18	140,823
8	Canadian Pacific Railway grants.....	187	122,504	213	231,058
9	North-West half-breed grants.....	50	11,664	3	560
10	Coal land sales	10	2,346	.....	.....
11	Free wood lots	3	60	.....	.....
12	Vancouver Island Railway grants.....	59	8,816	.....	.....
13	Manitoba North-Western Railway grants.....	12	6,558	.....	.....
14	Forest tree claims.....	1	160	.....	.....
15	School lands sale.....	1	1	.....	.....
Total.....		4,570	942,055	3,533	898,464

WM. M. GOODEVE,
Chief Clerk, Patent Branch.

APPENDIX C.

MEMORANDUM of Lists of Patents, prepared since the 1st day of January, 1886, and forwarded to the respective Registration Districts under the Provisions of the 78th Section of the Act 46 Vic., Cap. 17.

Name of Districts.	No.	No of Sheets.	Period Covered.
Manchester	1	11	1st July to 31st December, 1885.
Morris	1	5	do do
Carillon	1	6	do do
D'Iberville	1	7	do do
Lorette	1	8	do do
Selkirk	1	25	1st January to 31st December, 1885.
United Counties of Lisgar, Plessis and Gimli.	3	26	do do
Dufferin	1	23	do do
United Counties of Marquette and Fairford.....	2	27	do do
Portage la Prairie	1	13	do do
Rock Lake	1	35	do do
Norfolk	1	23	do do
Westburne	1	6	do do
Beautiful Plains	1	12	do do
Turtle Mountain	1	17	do do
Brandon	1	44	do do
Minnedosa and Riding Mountains	2	25	do do
Souris River	1	6	do do
Dennis	1	16	do do
Shoal Lake and Russell	2	28	do do
Souris, Regina and Touchwood.....	3	65	do do
Prince Albert	1	16	do do
Calgary	1	6	do do
Edmonton	1	12	do do
North-West Territories	1	9	do do
	32	471	
Special returns of lands passed from the Crown to Hudson Bay Company, under the operation of Dominion Lands Act .....	....	130	
	....	601	

WM. M. GOODEVE,
Chief Clerk, Patent Branch.

[PART I]

103

PART II.

DOMINION LANDS SURVEYS.

No. 1.

REPORT OF THE SURVEYOR GENERAL.

DEPARTMENT OF THE INTERIOR,

TECHNICAL BRANCH,

OTTAWA, 1st March, 1887.

SIR,—I have the honor to submit the following report on the business of this branch up to the 31st of October, 1886.

The correspondence for the year embraces:—

Letters received.....	1,345
Letters sent.....	<u>1,648</u>

Forty-three surveyors were employed; they were divided as follows:—

Two astronomers; one explorer; one topographer; one surveyor at Banff Hot Springs; three sub-dividers in British Columbia; two sub-dividers in the North-West Territories; one surveyor correcting an old survey at Carlton; nine surveyors of trails; twenty survey contractors; three examiners of surveys.

The astronomers were Messrs. O. J. Klotz and William Ogilvie; they were engaged on the determination of the latitudes and longitudes of various points along the line of the Canadian Pacific Railway in British Columbia and the North-West Territories. This work was commenced last year for the purpose of establishing the position of the Initial Meridians of the Dominion lands system of survey. The operations were carried as far east as Winnipeg, and it is proposed to complete them during the present year to the Atlantic seaboard, so as to have a continuous line across the continent.

The result shows the accuracy of our survey measurements, the error in longitude, after chaining from Winnipeg to Port Moody, a distance of 1,469 miles, was found to be only a few chains.

There will be a jog of about twenty chains in the surveys at the 6th Initial Meridian. This is due to the sinuosities of the international boundary, which is an astronomical line, while the base lines of the Dominion lands system of survey are true arcs of circle.

In addition to the above work, Mr. Klotz completed the survey of the railway line from Revelstoke to the summit of the Rocky Mountains, which is to serve as a basis for the extension of the Dominion lands system of survey in British Columbia.

Mr. F. W. Wilkins made a running survey of Lake Winnipeg. No accurate survey of the lake had ever been made before, and the work will prove very useful, not only as improving our maps, but also for the purpose of locating timber limits and mining or other claims.

Mr. J. J. McArthur was employed as topographer, and mapped the country on both sides of the railway from Canmore to Revelstoke. He proposed extending his operations to Shuswap Lake, but was prevented by the smoke of forest fires, which obliged him to abandon the work. This survey will be of much service, as showing the course of all rivers and creeks, the passes, valleys, &c., and the altitudes and approximate shape of the mountains. It involved considerable labor and occasionally some danger in climbing to the top of the highest peaks.

Mr. George A. Stewart made a topographical survey at the Banff Hot Springs, for the purpose of preparing a scheme for laying out the grounds into a park. The details of his work will be found in his report.

Messrs. James F. Garden and Thos. Fawcett sub-divided the lands in the Kamloops District. Their surveys are somewhat disconnected, as it was important to locate immediately the holdings of settlers on the lands applied for. I would par-

ticularly call attention to Mr. Garden's report. It contains very valuable information on the country. He suggests that the Government should assume control of the irrigation of the land, and says that it would greatly promote the settlement of the country. Irrigation in that district is a very important matter, and perhaps some scheme might be devised by which the money expended by the Government in building canals would bring fair returns in the shape of rental for the water, but private enterprise will do this in time.

In the New Westminster District, Mr. A. F. Cotton completed some of the old Provincial surveys and commenced some under the Dominion system. Running lines across timber ten or twelve feet in diameter is slow work; notwithstanding this, Mr. Cotton made good progress.

Mr. P. R. A. Bélanger established section boundaries between Canmore and the summit of the Rocky Mountains, in the valley followed by the railway. Generally, it may be said that the land is not well adapted for agricultural purposes, but being so close to the railway, it may become valuable for other purposes, and it was expedient to sub-divide it.

Mr. Edgar Bray completed some of the sub-division surveys in the vicinity of Lethbridge. Owing to the building of the railway from Dunmore to Lethbridge and the opening of the Galt Coal Mines, the adjoining country is being rapidly developed.

Col. Alex. Sproat corrected the sub-division made in 1882 and 1883 by F. Murphy, near Carlton, Sask., which was reported as being deficient in many respects. The work is not yet quite completed.

Nine surveyors were engaged in surveying trails in Manitoba and the North-West Territories. These surveys were made in accordance with the Acts 39 Victoria, chap. 20, and 43 Victoria, chap. 25, which provide that the Governor General in Council may order the survey of such trails on receiving a requisition to that effect from the Lieutenant-Governors of Manitoba or the North-West Territories. In many instances, it was found that settlers had closed the trails and refused to let them be opened again. In such cases, the difficulty was referred to the Lieutenant-Governor.

Twenty-one survey contracts were given out; they were all of small extent, but still were sufficient to cover all the lands required for settlement.

Messrs. J. S. Dennis and A. C. Webb examined the work performed by survey contractors before its acceptance, and they also made corrections to old surveys where errors had been found. Unfortunately Mr. Webb fell sick early in the spring and had to be replaced by Mr. Jos. Doupe. The work of the contractors is described as being in general fairly and honestly done. Mr. Dennis, in his report, gives some interesting details on the cattle industry in the North-West Territories.

An attempt was made to introduce photography on the surveys, a limited number of surveyors being provided with cameras. Photography has for a long time been used in the survey departments of most countries, and the processes have been so much improved of late that they now involve very little extra labor. Photography permits the obtaining of topographical information more easily and economically than any other method: it is particularly convenient in a mountainous country, and is now often employed for work of that description. It was proposed to illustrate surveyors' reports by reproducing their photographic views, thus adding interest to their descriptions. Unfortunately the results have not, so far, been very satisfactory. It is hoped that, with some modifications in the apparatus employed and the experience of the previous year, better work will be done next summer.

Meetings of the Board of Examiners for Dominion Land Surveyors were held at Ottawa in November, 1885, and in May and August, 1886.

The following gentlemen, having passed the requisite examinations, were granted commissions as Dominion Land Surveyors:—

F. H. Latimer, Winnipeg, Man.

J. E. Woods, Aylmer, Que.

J. E. Mailhot, Gentilly, Que.

B. Bourgeois, Bécancour, Que.

W. R. Burke, Ingersoll, Ont.
C. F. Aylsworth, Madoc, Ont.
K. Gamble, Winnipeg, Man.
W. J. Deans, Oshawa, Ont.
V. M. Roberts, Toronto, Ont.
J. M. M. Biggs, Orillia, Ont.
W. G. Furlong, Lachute, Que.
J. R. Vicars, Cannington, Ont.
F. X. Fafard, L'Islet, Que.
E. A. LeBoutillier, St. Thomas, Que.

Preliminary Certificates were granted to :—

J. S. J. Routhier, Vankleek Hill, Ont.
T. O. Wilkinson, Winnipeg, Man.
F. L. Fellowes, Belleville, Ont.
A. Fawcett, Gravenhurst, Ont.
E. W. Rathbun, Napanee, Ont.
J. Fleming, Toronto, Ont.
J. W. Moffat, Montreal, Que.
A. J. Tremblay, St. Roch des Aulnets, Que.

An examination was held by me at New Westminster, B.C., in accordance with sub-clause 5 of clause 88 of the Dominion Lands Act. The papers of the candidates have not yet been examined by the Board.

In the latter part of the summer, I visited the survey parties in British Columbia. In the plains of the North West Territories, surveying is comparatively easy, and all the circumstances in connection with an expedition can be foreseen and provided for; the instructions can be made plain and clear, and it is seldom necessary to depart from them. It is not so in British Columbia; the nature of the country is such that after a first inspection of the ground the surveyor will find difficulties which he did not anticipate. He must then adopt one of two courses: either write to Ottawa for instructions, which will perhaps require three or four letters and necessary delays before an understanding is arrived at, or act on his own judgment with the risk of doing work that will clash with the general plan of operations adopted by the Government. Under such conditions it is evident that a visit from the Surveyor General is imperative. I may cite the case of a surveyor who was making some of his surveys on a wrong system; had I not discovered the fact in conversation with him, part of his work for the season would have been lost.

I transmit herewith a schedule of the surveyors employed during the year and those of their reports received up to this date.

I also enclose the reports of the Chief Inspector of Surveys, the regulations of the Board of Examiners for Dominion Land Surveyors, the programme of the examinations, modified as required by the amendments of 1885 to the Dominion Lands Act, and the examination papers given to candidates at the last meeting of the Board.

I have the honor to be, Sir,

Your obedient servant,

E. DEVILLE,
Surveyor General.

A. M. BURGESS, Esq.,
Deputy Minister of the Interior,
Ottawa.

SCHEDULE showing Dominion Land Surveyors employed during the Year ending 31st October, 1886.

Surveyor.	Province.	Description of Survey.
Abrey, G. B.....	Toronto, Ont.	Sub-division of Townships 23, in Ranges 8 and 9; Township 24, in Range 10, and Township 27, in Range 12, west of the 2nd Initial Meridian.
Boivin, E.	Bagotville, Que.	Sub-division of Township 51, in Range 24; and Townships 53, in Ranges 26 and 27, west of the 3rd Initial Meridian.
Brabazon, A. J.....	Portage du Fort, Que.	Sub-division of Townships 29, 32 and 33, in Range 16; and Township 31, in Range 17, west of the 2nd Initial Meridian.
Brunelle, F. E	Somerset, Que.....	Sub-division of Township 3, in Range 27; and Townships 4 and 5, in Range 28, west of the 2nd Initial Meridian; and outlines of Township 5, in Range 4, west of the 3rd Initial Meridian.
Bourgeois, John	Three Rivers, Que....	Sub-division of Townships 4 and 5, in Range 26; Townships 4, 5 and 6, in Range 27, west of the 2nd Initial Meridian; and Township 4, in Range 3, west of the 3rd Initial Meridian.
Bray, Edgar.....	Oakville, Ont.....	Sub-division of Township 5, in Range 23; Townships 6, in Ranges 21, 22 and 23; and Township 7, in Range 20; and outlines of Township 4, in Range 23, all west of the 4th Initial Meridian; and traverses of Belly, Bow and St. Mary's Rivers.
Bélanger, P. R. A....	L'Islet, Que	Sub-division of Township 24, in Range 9; Townships 24 and 25, in Range 10; Townships 25 and 26, in Ranges 11, 12 and 13; and Townships 26 and 27, in Range 14, west of the 5th Initial Meridian.
Biggar, C. A.....	Ottawa, Ont.....	Survey of Trails from Red Deer River to Calgary and Macleod, and from Macleod to Blackfoot Crossing.
Cotton, A. F.....	Ottawa, Ont.....	Sub-division of Townships 3 and 4, in Ranges 28 and 29, west of the Coast Meridian; and Townships 12, 15, 24 and 27, New-Westminster District.
Dumais, P. T. C.....	Hull, Que.....	Sub-division of Townships 52 and 53, in Ranges 16 and 17, west of the 4th Initial Meridian.
Drewry, W. S.....	Belleville, Ont.....	Sub-division of Townships 50 and 51, in Range 23; Township 50, in Range 24; and Township 49, in Range 25, west of the 3rd Initial Meridian.
DeChesne, L. N.....	St. Roch des Aulnets, Que.....	Sub-division of Townships 21 and 22, in Ranges 27, 28 and 29, west of the 3rd Initial Meridian.
DuBerger, C. C.....	Murray Bay, Que.....	Sub-division of Townships 34, 35 and 36, in Range 1, west of the 5th Initial Meridian.
Dennis, J. S.....	Aylmer, Que.	Correction and Inspection of Surveys.
Doupe, Jos.....	Winnipeg, Man.....	Correction and Inspection of Surveys.
Dufresne, J. I.	Montmagny, Que. ...	Survey of Trails in the neighborhood of Portage la Prairie, Totogon and Poplar Point.
Freeman, N. R.....	Milton, N.S.....	Sub-division of Townships 50 and 51, in Ranges 27 and 28, west of the 4th Initial Meridian.
Fitzgerald, J. W.....	Peterboro, Ont.....	Sub-division of Townships 11, 12 and 13, in Ranges 9 and 10; and Townships 11 and 12, Range 11, east of the 1st Meridian.
Fawcett, Thos.....	Gravenhurst, Ont....	Sub-divisions of parts of Townships 17, in Ranges 12, 13 and 14; Townships 18 and 19, in Ranges 14 and 15; Townships 16, 17, 18 and 19, in Ranges 16, 17 and 18; Townships 19 and 20, in Range 19, and Townships 20, in Ranges 20, 21 and 24, west of the Coast Meridian.
Gosselin, L.....	Quebec, Que.....	Sub-division of Township 50, in Ranges 17 and 18, and Townships 51, in Ranges 16 and 17, west of the 4th Initial Meridian.
Garden, Jas. F.	Toronto, Ont.....	Sub-division of parts of Townships 20 and 21, in Range 13; Townships 19 and 20, in Range 14; Township 20, in Range 15; Townships 21, 22 and 23, in Range 17; Townships 20 and 21, in Range 18; Township 21, in Range 19; Townships 21, in Ranges 20, 21 and 23, west of the Coast Meridian.

SCHEDULE showing Dominion Land Surveyors employed.—*Concluded.*

Surveyor.	Province.	Description of Survey.
Green, T. D.....	Ottawa, Ont.....	Survey of Trail from Fort Ellice to Moosomin, and from Fort Ellice to N.E. corner of Township 20, in Range 22, west of the 2nd Initial Meridian. Also traverse of Jumping Creek.
Klotz, Otto, J.....	Preston, Ont.....	Survey of Canadian Pacific Railway from Summit of Rocky Mountain Range to Revelstoke, on the Columbia River, and astronomical work in British Columbia and North West Territories.
Laurie, R. C.....	Battleford, Sask.....	Survey of Trail from Battleford to Swift Current.
Michaud, J. L.....	Ste. Anne de Bellevue, Que.....	Sub-division of Township 35, in Range 28, and Townships 31, 32, 33 and 34, in Ranges 28 and 29, west of the 4th Initial Meridian.
MacMartin, G. E.....	St. Andrews, Que....	Sub-division of Townships 6 and 7, in Range 29; Townships 6 and 7, in Range 30, west of the 4th Initial Meridian.
McPhillips, Geo.....	Winnipeg, Man.....	Sub-division of Township 21, in Range 10, and Townships 22 and 23, in Range 11, west of the 1st Initial Meridian.
McAree, John.....	Toronto, Ont.....	Survey of Trails in the neighborhood of Kildonan and other points in Manitoba.
McLatchie, John.....	Ottawa, Ont.....	Survey of Northerly Trail from East Boundary of Township 15, in Range 13, west of the 1st Initial Meridian to Fort Ellice.
McPhillips, R. C.....	Winnipeg, Man.....	Survey of four Trails in the Province of Manitoba.
McArthur, J. J.....	Aylmer, Que.....	Topographical survey along the line of the Canadian Pacific Railway through the Rocky, Selkirk and Gold Ranges of Mountains.
Macdougall, A. H....	Port Arthur, Ont.....	Sub-division of Townships 24, in Ranges 11 and 12; Townships 25 and 26, in Range 11, and part of Township 24, Range 10, all west of Principal Meridian.
Ogilvie, Wm.....	Ottawa, Ont.....	Longitude determinations in British Columbia.
Rainboth, G. O.....	Aylmer, Que.....	Sub-division of Townships 51 and 52, in Range 1, and Township 51, in Range 2, west of the 5th Initial Meridian.
Reid, J. L.....	Port Hope, Ont.....	Survey of Trail from Troy to Prince Albert.
Robertson, H. H.....	Montmagny, Que.....	Sub-division of Townships 23 and 24, in Ranges 27, 28 and 29, west of the 3rd Initial Meridian.
Roy, Geo. P.....	Quebec, Que.....	Survey of Trail from Calgary to Edmonton.
Starkey, S. M.....	Starkey, N.B.....	Sub-division of Townships 50, in Ranges 1 and 2 west of the 5th Initial Meridian.
Sproat, A.....	Prince Albert, Sask..	Correction survey in Townships 45, 46 and 47, in Range 4; and Township 46, in Range 5 west of the 3rd Initial Meridian.
Stewart, G. A.....	Winnipeg, Man.....	Survey of Hot Springs Reservation at Banff; traverses of Bow and Spray Rivers, and laying out of Town Plot, Roads, etc.
Webb, A. C.....	Brighton, Ont.....	Correction and Inspection of surveys.
Wilkins, F.W.....	Norwood, Ont.....	Exploratory survey of Lake Winnipeg.
Wolf, C.E.....	Ottawa, Ont.....	Sub-division of Townships 7, 8 and 9 in Range 1, and Townships 6 and 7 in Range 2 west of the 5th Initial Meridian.

No. 2.

REPORT OF W. F. KING, CHIEF INSPECTOR OF SURVEYS.

DEPARTMENT OF THE INTERIOR,
TECHNICAL BRANCH,
OTTAWA, 1st March, 1887.

SIR,—In reporting upon that part of the work of this branch which has fallen more immediately under my supervision, I will begin with the traverse of the Canadian Pacific Railway between the Pacific coast and the summit of the Rocky Mountains, the computations of which were made in this office, and an account of which may be of interest.

The object of this traverse may be thus briefly stated: A belt of land twenty miles in width on each side of the railway line required survey. This tract is much broken by mountain ranges which, of course, are valueless for all purposes of agriculture, but include among them many fertile valleys. In the survey of these discontinuous and sometimes widely separated tracts of agricultural land, there was a choice of two methods, either to lay out isolated townships here and there, wherever necessary, under no regular system, or to follow a regular system of rectangular townships.

The advantages of the regular system in its ready designation of parcels of land, and the ease of extending or re-establishing the original surveys, caused its adoption. It was determined to continue the North-West system of Dominion lands surveys throughout the railway belt. It being manifestly impossible to follow the usual method of projecting base lines and township outlines in a mountainous country, resort was had to a survey along the line of the Canadian Pacific Railway, which by its embankments and cuttings afforded an easy route for a survey, and by its central position with regard to the lands to be surveyed formed a most excellent base of operations for surveys throughout the belt.

The base lines of the Dominion lands system of survey are each surveyed as a succession of chords, 486 chains in length, of a circle of latitude. The outlines of townships and the meridian boundaries between sections are surveyed north and south from the base line for a depth of two townships, encountering at the "correction" lines the corresponding systems of lines drawn from the next adjacent bases. If the system of survey were carried over a tract of country with perfect accuracy, each section and quarter-section corner would fall in a certain latitude and longitude, which can be calculated beforehand.

Accordingly, if the latitude and longitude of any point be found by a traverse such as that of the Canadian Pacific Railway, or in any other manner, the position of that point in the survey system can be found by comparison of its latitude and longitude with that of the nearest section corner. So that the stations of the traverse form a series of known points from which the positions of required section corners can be established on the ground by means of a short measurement.

As the necessary calculations were of course too extensive to be completed by the surveyors, who had also other duties to attend to, and as time was an object, the traverse notes, as soon as the field work was completed, were sent by the surveyor to this office to be completed here.

The notes furnished consisted of the distances as measured with a sixty-six feet steel band, and the vernier readings of the instrument at each station on the back and foresights, together with astronomical observations for azimuth at several points of the traverse.

The first step in the computation was to obtain the bearing of each course by the formula

$$\begin{aligned} \text{Bearing} = & \text{Bearing of previous course} \\ & + 180^\circ + \text{mean of vernier readings on foresight,} \\ & - \text{mean of readings on back-sight.} \end{aligned}$$

The bearing thus obtained is the bearing referred to the meridian of the first course (this first bearing having been observed astronomically). It must be corrected for the convergence of meridians so that each course shall have its true bearing referred to the meridian of its middle point. The convergence is found by plotting the traverse with these bearings and the distances, and measuring from the plan the east or west difference of longitude of each point from the meridian of the first. These differences multiplied by the sine of the latitude give the convergence corrections to be applied to the various bearings. Should a bearing so corrected not agree at any point with the astronomical azimuth observed at that point, the small residual is attributed to errors in reading the angles, some of which errors have a tendency to accumulate. This error is then distributed equally among all the angles of deflection, and the bearings so corrected are finally in a condition to be used in the following steps of the calculation.

With these bearings and the chained distances are calculated the "latitudes and departures" in the usual way, being the distance multiplied by the cosine and sine of the bearing respectively.

These are differences of latitude and longitude in chains. They must now be converted into seconds of arc of latitude and longitude by means of multipliers which are functions of the latitudes of the points, these multipliers being taken from a table constructed for the purpose from the second table given in the Manual of Surveys, and giving these functions for each minute of latitude.

The successive addition of these latitude and longitude differences gives the latitude and longitude of each instrumental station of the traverse.

The next operation is the construction from the Manual of Survey of a table of the latitude of each east and west section line of a theoretically perfect survey of the Dominion lands system, tabulating the latitudes of as many section lines as will include the extreme latitudes of the railway line, and another table giving the longitude of each of the meridian section lines.

The subtraction of the latitude of each station from that of the section line next north of it, and the subtraction from the longitude of each station of that of the section line next east of it, give the distance in seconds of arc of latitude and longitude of each point from the north-east corner of the section in which it lies, and the numbers of the two section lines employed in this subtraction give the number of that section, together with the township and the range.

The distances in seconds must now be converted into distances in chains. This is done by means of a second table of multipliers reciprocals, to the former.

The instrumental stations were usually situated on the railway track, and were hence not permanently marked on the ground, but many of them have been perpetuated by witness or reference posts.

A table has been made of these stations, giving for each the numbers of the section, township and range in which it lies, and distance north and east from it to the north east-corner of the section, together with the bearing and distance from it to its reference post, and the marking by which that post may be identified.

This table will be furnished to all surveyors making surveys in the railway belt, in British Columbia, and will enable them, finding one of these witness posts, to establish on the ground the nearest section corner with as much accuracy as if they had projected the base and other lines of the Dominion lands system all the way from the Initial Meridian.

There are 854 of these witness posts, being one for every third or fourth instrumental station.

The amount of work involved in reducing the traverse may be judged by the fact

that in the distance of 507 miles from the summit to Port Moody, there were 2,918 instrumental stations, the average length of a course being therefore less than 14 chains, many of the courses not exceeding 5 or 6 chains. Despite the shortness of the courses, from which large azimuth discrepancies might be expected to arise, the care taken in the reading of three verniers each time, and the reversal of the instrument at each station, has resulted in a high degree of accuracy.

The field work was performed from Port Moody to Revelstoke in 1885 by Wm. Ogilvie, D.L.S., and from the summit to Revelstoke in 1886 by Otto J. Klotz, D.T.S.

The latitudes and longitudes of the latter part of the traverse were based on the known latitude and longitude of the intersection of the seventh base line, and the fifth Initial Meridian near Calgary. The former traverse was based on astronomical determinations of latitude and longitude at Port Moody and Kamloops respectively.

There is a closing error of nearly 20 chains in latitude between the two parts of the traverse. This appears to be principally due to an abnormal deviation of the plumb line at Port Moody, probably caused by the attraction of the Coast Range. This is an error which it was impossible to avoid. It has been left as a jog on the 6th Initial Meridian, near Revelstoke, in such a way as not to interfere with the regularity of the system. The discrepancy in longitude is very small.

I may here make some remarks upon the astronomical positions upon which our surveys are based.

The Principal Meridian, in Manitoba, was in the first place surveyed as the initial line of the surveys. It lay in no specified longitude, but the starting point of one of the base lines was fixed by latitude observations. From this meridian the surveys were projected east and west.

The International Boundary Commission in 1872 determined the longitude of a point at West Lynne by telegraph from Chicago Observatory. The special survey in 1874-75, from this point, by measurement, determined the longitude of the Principal Meridian ($97^{\circ} 27' 5''$), and then by a triangulation connected the Principal Meridian with Winnipeg, and established the 2nd Initial Meridian, in the 102nd degree of west longitude. The 3rd, 4th, 5th and 6th Initial Meridians have been established by chain measurements from this 2nd Meridian at exactly four degrees of longitude apart, subject of course to whatever errors exist from the necessary imperfection of chain surveys. An independent determination of these latitudes by telegraphic exchange of time would be very interesting, but until recently it has been impossible, from the incompleteness of telegraphic communication, to effect this.

In 1885 Messrs. Klotz and Drummond determined by telegraph the longitudes of Victoria, Port Moody and Kamloops, in British Columbia. These longitudes depend upon that of Seattle, in Washington Territory, determined by the United States Coast Survey.

Last year Messrs. Klotz and Ogilvie continued this work, connecting Kamloops with Revelstoke and Field, B.C., Calgary, N.W.T., and Winnipeg. Connection was made at Calgary with the 5th Initial Meridian, but unfortunately the lateness of the season prevented the connection of the astronomical station at Winnipeg with the triangulation points of the special survey. This tie would have afforded a check on the surveys from Winnipeg to Port Moody.

As stated above, the surveys all the way to Revelstoke depend upon the Principal Meridian as determined by the special survey from West Lynne and Chicago, and it is satisfactory to see that the longitude of the terminal point as determined from Seattle, and thereby connected with Chicago, also agrees within one or two chains. This indicates a high degree of precision in our surveys, but this result cannot be depended upon with certainty until the above mentioned connection at Winnipeg has been made.

Since the initial meridians were first surveyed, the intervals between them have been covered with a network of base and township lines. Each base line affords an independent determination of the distances between the meridians, and the closings of the township outlines at the correction lines give checks upon the chainage as well as the azimuths of the base lines.

All the closings have been tabulated in this office in a graphic form, with a view not only to the detection of errors in the surveys, but also to give an idea of the accuracy of chain surveys. For the attainment of the latter object, it would be desirable to have determinations of longitude by telegraph at the various initial meridians, viz., the second, third and fourth. The first and fifth, situated near Winnipeg and Calgary respectively, were determined as above mentioned last year. Winnipeg should also be connected by telegraph with the United States Coast Survey, either direct to Chicago, or, through Montreal, with Cambridge or some other point.

Something has been done of late years in the way of determination of the magnetic lines in the North-West Territory and British Columbia. An extensive magnetic survey, covering the greater part of Canada, was made by Sir Henry Lefroy more than forty years ago. Redetermination of the magnetic elements should give valuable information as to their secular variations, &c. In our work the declinations have been observed with an ordinary transit theodolite furnished with a compass box, the inclination by means of a dip circle of the Kew pattern, and the intensity by the method of deflection by a magnet. Observations of this kind have been made at many points along the Canadian Pacific Railway line, the North Saskatchewan from Edmonton to Lake Winnipeg, the Athabasca and Peace Rivers, the Nelson River, and the English and Albany Rivers. Some observations were taken at Cat Lake, some distance north of Lake St. Joseph, near which point, according to Sir Henry Lefroy's calculation, there should exist a maximum pole of intensity. The observations there, however, indicate that the surveyor had not reached that pole, but that it lay further to the north.

I am now engaged in compiling, for publication, a complete list of all the magnetic observations taken by surveyors acting under instructions from this Department.

Another important matter is the investigation, and correction, when necessary, of errors in old surveys. Our survey system fortunately prevents the accumulation of errors which unavoidably happen in chain surveys, such errors usually being confined to the township in which they occur. Minor errors of survey frequently occur, such as the planting of a post off the line, or on the line at a wrong distance, erroneous marking of a corner or witness post, or omission of posts. These errors are easily corrected. If the error is in the township outline the correction, however, frequently entails the alteration of a considerable portion of the interior sub-division. The field work of these corrections has been carried on during the past season by Messrs. J. S. Dennis, A. C. Webb and Jos. Doupe, Dominion Land Surveyors, who have also acted as examiners of the surveys under contract. They report the work of these contracts generally well and faithfully performed.

As the correction surveys may sometimes clash with surveys being executed under contract, thus causing delay and expense to the sub-divider, I would respectfully recommend that the surveyor having charge of the correction surveys be given power, in dealing with such cases, to give instructions to the subdivider, without referring the matter to this office, and thereby unnecessarily increasing the loss of time.

In the grazing country it has been found that the mounds and posts erected by surveyors are very frequently destroyed by cattle, which tear down the mounds with their horns, and trample the earth into the pits. The posts being knocked down, no mark is left, the luxuriant grass soon covering up all traces of disturbed earth. To avoid this, it has been decided, in these districts, to dispense altogether with the mound. An iron post, larger than those ordinarily used, will be driven solidly into the earth, and the four pits dug as usual, but the earth from these, instead of being made into a mound, will be scattered about so as not to attract the attention of the cattle.

The exploratory surveys made in the last three years of the Peace and Athabasca Rivers, the Lower Saskatchewan and Nelson Rivers, the English and Albany Rivers, and Lake Winnipeg, have resulted in the procuring of much valuable information, both topographical and descriptive. It is desirable that further surveys of

this kind should be made of the important river systems of the North-West, especially in the northern part of the Territories. Hitherto, in these surveys, the surveyors have not obtained much information as to the levels of the country through which they pass. I beg to suggest that in future surveys of this kind, the surveyors be instructed, by observing the rate of current of the rivers on which they travel at a number of points, to obtain an approximation to the average fall of the river, which, with the distance travelled, will give the total descent. Rapids or falls should be directly measured by means of an aneroid barometer, or otherwise.

I have the honor to be, Sir,

Your obedient servant,

W. F. KING,

Chief Inspector of Surveys.

The Surveyor General,
Department of the Interior,
Ottawa.

No. 3.

REPORT OF J. S. DENNIS, D. T. S.

EXAMINATION OF SURVEYS.

OTTAWA, 29th December, 1886.

SIR,—I have the honor to submit the following report upon the work of corrections to existing surveys, and inspection of sub-division survey contracts, in the North-West Territories under my charge during the past season.

In compliance with your instructions I left Ottawa on the evening of the 12th of April, and reached Winnipeg on the 15th. After a delay of two days, spent in purchasing supplies, carts, &c., I arrived at Moose Jaw on the morning of the 20th. The supplies, &c., shipped from Winnipeg did not reach me until the 24th, and on Monday morning, the 26th, I left Moose Jaw for Long Lake, some 50 miles distant. At Long Lake I completed the necessary traverse of the north and south shores of the lake in Townships 21, Ranges 22 and 23 west of 2nd Initial Meridian, to establish their correct position; and returned to Moose Jaw on the 15th of May. I was delayed until the 18th waiting the arrival of Mr. Webb. After arranging with him a division of the necessary corrections to existing surveys, and the examination of contract surveys, I left Moose Jaw on the morning of the 20th and proceeded south by the Wood Mountain trail to the intersection of the 3rd Base and the 3rd Initial Meridian, where some corrections were necessary. I then proceeded across country to Swift Current, and from there travelled along the railway line to Medicine Hat, making some necessary correction surveys on the way. From this point I proceeded north, following the east bank of the South Saskatchewan River as far as Township 20, Range 2, west of 4th Initial Meridian, making re-surveys in a number of townships adjoining the river. I then returned, and following the Fort McLeod trail proceeded west to Township 12, Range 10, west of 4th Initial Meridian, effecting corrections at several points. Returning I crossed the river at Medicine Hat and went west across country to Township 12, Range 13, west of 4th Initial Meridian, and after completing a re-survey in that township I followed the west bank of the South Saskatchewan River to its intersection with the Red Deer River, making necessary re-surveys at different points. After completing the examination survey in contracts numbers 9 and 10 I followed the south bank of the Red Deer River westerly to Range 12, west of 4th Initial Meridian, making necessary correction surveys *en route*, and then struck across country to the railway line at Cassil's Station. Following the railway line I reached Calgary on the 18th of August. Leaving on the 19th, I proceeded north by the Edmonton trail to the Red Deer River, and after completing the examination surveys in contracts numbers 18 and 19, I returned to Calgary and proceeded south to Fort McLeod, reaching that point on the 7th of September. I then visited contracts numbers 5 and 6, at Pincher Creek, and after effecting the examination surveys, in these contracts, and completing some necessary corrections to existing surveys in the vicinity, returned to Fort McLeod, and proceeded east to Medicine Hat, *via* Lethbridge and Dunmore.

It having been found that an additional inspection survey was necessary in contract No. 9, I left Medicine Hat on the 30th September, and proceeded across country to Township 22, Range 29 west of 3rd Initial Meridian, and effected the required examination. I then returned to Medicine Hat and shipped my outfit to Moose Jaw by rail, reaching that point on the 13th of October.

Moving south to Wood Mountain, I inspected contracts Nos. 7 and 8, and returned to Moose Jaw on the 21st of October.

The season being now well advanced, I paid off my party, stored my outfit, and returned to Ottawa, reaching this point on the 29th of October, since which time I have been engaged in completing the necessary returns of work.

During the season forty-two townships were visited in which corrections to existing surveys were needed; in effecting these a great many miles of line were re-surveyed, and a large number of mounds and posts placed.

Eight sub-division survey contracts were inspected, necessitating a re-survey of ninety-eight miles of line and eleven miles of traverse. I might say that the work in the eight contracts inspected was, with one exception, found to have been fairly and honestly performed.

In completing the above work, a total distance of something over 1,600 miles was travelled by trail.

The work at times was very much retarded owing to the great difficulty experienced in procuring water. The season was an exceptionally dry one, and there was no water anywhere except in the large rivers; at one time we were without water for two days, although at the time we were travelling from twenty-five to thirty miles each day.

A number of photographs were taken in the different districts visited, most of which, I regret to say, were destroyed in passage through the mail.

In accordance with the suggestions contained in your circular accompanying my instructions, I would submit the following remarks regarding the country travelled over, the crops, rainfall, necessity for irrigation, cattle industry, &c., which may prove of interest.

That portion of the southern part of the Territories travelled over has been so thoroughly described by the many surveyors and others who have visited it, that a detailed description of the soil, &c., is unnecessary.

The soil throughout the southern portion of the Territories is a light loam, well adapted for the growth of cereals, but requiring a greater amount of moisture than the heavy black loam of the Province of Manitoba, and when it is noted that the total rainfall at Medicine Hat, which is about a central point, for that part of the year up to the end of July, was only four inches, the reason for the failure of this season's crops will be readily seen.

Consideration of this subject leads to the conclusion that something must be done, where practicable, to ensure good crops by the aid of irrigation.

Most of the country, owing to its height above the rivers and the scarcity of other water supply, cannot be benefited in this way, but there are large tracts of bottom lands along the rivers, and also adjoining some of the larger creeks and lakes, which might be easily and cheaply irrigated. A system of pumping by windmill, with small main ditches, could be easily carried out.

It is unnecessary to say anything in reference to the benefits of irrigation. The question has been thoroughly investigated, and the beneficial results proved in many of the Western States and Territories, where millions of dollars have been expended by the Federal and State authorities, and by private companies, in bringing water long distances, and in this way converting large tracts of otherwise useless country into rich and prosperous districts. There is no doubt that in many portions of our Territories irrigation will be developed on a large scale in the future, either from canals constructed by the Government or by private enterprise.

This fact was proved conclusively to me, this summer, by seeing a small garden in the valley of the Saskatchewan River, near Medicine Hat, in which a splendid crop of vegetables was raised, owing to the partial irrigation secured by the construction of a small ditch from a spring on the adjoining hillside to the garden, whereas all the other gardens in the vicinity, dependent on the natural rainfall, raised absolutely nothing.

The statement may I think be safely made, that the experience of the farmers in the southern portions of the Territories goes to show that there is no certainty of a crop while dependent on the natural rainfall.

The cattle ranching industry is making wonderfully rapid strides in our Territories, as instanced by the fact that districts which a short time ago were considered unsuited for ranching purposes are now stocked by herds of cattle doing well.

I happened to be at Maple Creek in the spring, during the "round up," and was astonished to note the excellent condition of the cattle which had been wintered in that vicinity, without shelter or hay. Other bands of cattle were visited at the mouth of the Red Deer River, at Medicine Hat, and at Wood Mountain, all of which were found in flourishing condition.

The generally accepted theory has been that the grazing area was restricted to the south-western portion of the Territories, but the present indications are that a very much larger area is well adapted for grazing. I am of opinion that all the country in the vicinity of, and south of the Canadian Pacific Railway line to the international boundary, west of Moose Jaw, is more or less adapted for cattle ranching.

I saw many thousand head of cattle during the season, and in no instance did I notice any that did not look well and in good condition.

The raising of sheep is now being extensively conducted in many districts of the Territories, noticeably in the vicinity of Calgary, there now being about 25,000 head of sheep north of the Bow River in that vicinity. There is, of course, a more immediate return from sheep than cattle, the increase being greater, the yearly crop of wool being available for market, and a return from the increase is looked for at the end of the first year, whereas in cattle raising there is no return for three years after beginning; but sheep are more liable to destruction by wolves than the cattle. From present indications some action will have to be taken shortly to rid the country of these pests.

The development of the coal mining industry in the Territories has been mentioned by many who have lately visited the country, and the question of a bountiful and cheap supply of fuel may now be looked upon as assured. In this particular our Territories have a great advantage over the country immediately south of the International Boundary, where the supply of coal is limited and of poor quality.

I have the honor to be, Sir,

Your obedient servant,

J. S. DENNIS, D.T.S.

The Surveyor General,
Department of the Interior,
Ottawa.

No. 4.

REPORT OF JOSEPH DOUPE, D.L.S.

EXAMINATION OF SURVEYS.

WINNIPEG, 30th December, 1886.

SIR,—I have the honor to submit the following brief general report in connection with my operations of the past season.

The character of my duties, viz: inspection of new surveys and making corrections in previous ones in places widely scattered, involved a great amount of travel, and brought under my observation a number of new settlements and a vast extent of country, covering, from the starting point at Moose Jaw to the termination at Calgary, over eleven hundred miles of travel with carts.

The localities visited extend from the Carrot River Settlement westward, along and in the vicinity of the North Saskatchewan River, to over thirty miles west of Edmonton, or from the 105th to the 114th degree of west longitude.

The technical details of my work are reserved for separate reports to accompany the returns.

The past season has been an unusually dry one throughout the North-West, but apparently more so to the east of the 4th Initial Meridian or 110th degree of longitude than west of it. The fall of 1885 was very dry, followed by a light snowfall during the winter, and this again being succeeded by an unusually dry spring, left the ground in such a condition that the effects of an ordinary shower of rain seemed invisible. Swamps and muskegs flooded during several previous years were now quite dry.

Prairie fires in the fall of 1885 swept over vast tracts of country, destroying the young timber over large areas, thereby doing an immense amount of damage, and in low places burning the prairie sod to such an extent that numerous and sometimes large vacant spaces occur in the vegetation of the past season. The fires spread comparatively little last fall, simply because the grass was too short.

Of wild fruit, cherries, currants, gooseberries, strawberries and raspberries were in fair quantity, but "saskatoon" berries were in greatest profusion during the whole of July, the bushes throughout the wooded and brushy regions being literally loaded with them, and even on the driest sand hills.

In accordance with your telegram of the 26th June, I started from Winnipeg the following morning and reached Moose Jaw on the 18th. Major Webb, who through failing health was obliged to relinquish work, arrived on 21st, having left most of his party and outfit at St. Laurent, over two hundred miles to the north. A transfer of outfit and supplies having been arranged and a couple of days' rest allowed the horses, I set out on the 24th and arrived at the camp in St. Laurent on the 29th.

Carrot River settlement, in Townships 45, Ranges 21 and 22, west of 2nd Meridian, (with a few outlying claims in adjoining townships) is situated in a beautiful tract of most fertile country, which extends many miles eastward along and south of the Carrot River, and is well adapted for farming and stock-raising. This settlement was started eight or nine years ago by a number of men chiefly from Ontario, who expected that the Canadian Pacific Railway would pass through or near the place. At first a great deal of vigor was displayed, but being disappointed by the change in the route of the railway, and seeing no immediate prospect of a market for their products, a number have temporarily left the settlement, and others are now giving

more attention to raising cattle than cultivation of the soil. Doubtless, on the nearer approach of the Manitoba and North-Western, or some other railway, this settlement will rapidly thrive and prosper. It would be difficult to find such an extent of country possessing so many natural attractions as this, and it is claimed by the settlers that even better is to be found eastward than here.

The dry season has considerably retarded the growth of the crops, but some are in a fair condition.

Carrot River is very low this summer. Two years ago it was 8 or 10 feet deep all summer. A large part of Water Hen Lake, through which Carrot River flows, is now a splendid meadow, where, at the time of survey of these townships, there was deep water. The fact of its being a meadow now shows that it is flooded only periodically. Our visit here was from 3rd to 7th July. Returning to the South Saskatchewan we were occupied until the 10th in Township 47, Range 25 A. Across the river in Township 46, Range 25, extending several miles up and down the left bank is a half-breed settlement, which appeared prosperous; no communication was had with residents, but there were many large fields of grain and several herds of cattle to be seen from our side.

Crossing the river at the ferry before mentioned, we travelled six or seven miles north through sandy hills and poplar bluffs, then the country becomes more level and the soil improves, and changes to clayey loam, and the houses of settlers begin to dot the plain. These continue all the way to Prince Albert, eighteen or twenty miles, where we arrived on 13th July.

Prince Albert, the capital of the District of Saskatchewan, is destined to become an important centre, but having been many times described by more able pens, I will dismiss it with but slight notice. Several railways are now pointing in this direction, and soon the slight depression under which it now suffers in conjunction with the surrounding settlement, will disappear. There is a bank, a good public school and a Church of England college, and a large saw and planing mill, with lath and shingle machines to supply the place with building material. There were two grist mills, but both have been burned. The Dominion Government is this year erecting a brick court house and gaol. A large amount of business is done by the merchants here. Settlements as far as forty miles or more east and west draw their supplies from here. A considerably less area than usual is under crop this year, owing to the reasons before given, but the depression is only temporary; most of the settlers are in comfortable circumstances, judging by the amount of improvements and number of stock on the various farms. The land here is very rich and fertile.

Between this settlement and Carlton we pass through a strip of rolling wooded land with some sandy hills; this strip is seven or eight miles wide and extends through Range 2 and part of 3, west of 3rd Meridian, after which the country again becomes undulating, is chiefly prairie, and the soil a rich clay loam, with a slight admixture of sand, rendering it capital for farming purposes.

Carlton, where we arrived on 5th August, is situated in a fine agricultural district, but as yet only a few half-breeds are located in the vicinity. The fort, destroyed in 1885, has not been rebuilt; the Hudson Bay Company during summer occupy a temporary place opposite, on the north side of the river, where goods are received from the steamers and dispatched by carts to Green Lake, whence they are forwarded by canoes and boats to the different posts about the head of Churchill River. Formerly all the goods for Lake Athabasca and Mackenzie River posts went by this route, but now go *via* Edmonton.

On 12th August we crossed the North Saskatchewan by the Hudson Bay Company's ferry here and took the trail running north of Redberry Lake towards Battleford, eighty miles distant. Along this trail there is a large proportion of most excellent farming land, and at intervals large meadows of fine grass. The parts less adapted for agriculture are excellent for stock raising. Indeed, all the country on both sides of the North Saskatchewan, from Prince Albert to Edmonton, with a few exceptional places of very limited extent, is of the finest character for farming purposes and stock-raising. It produces grass most abundantly, and in many places long

grass even to the hill tops. But from Victoria eastward the snowfall being deeper and the climate colder than about Calgary and Fort McLeod, stock would necessarily have to be provided with hay and shelter during the winter, although native horses remain out all winter and thrive. In fact, at Fort Pitt, in 1882, some native horses that I used on survey during summer and until end of January, 1883, were then turned loose, and in April were found them in excellent condition.

Battleford, which we first sighted on 16th August, has wonderfully improved this season. A great many new buildings have been put up, and the population has considerably increased. Two mills supply the place with lumber, lath and shingles. Most of the lumber comes from above Edmonton, some being obtained from places along the river lower down. The price of lumber being high most of the buildings in Battleford are of hewn logs. There is also a steam grist mill here, and the Government has established an industrial school for Indian children. A comparatively large force of mounted police are stationed here and new buildings for their accommodation are to be built this season.

About twenty miles north-west of Battleford we come to the "Taylor" settlement, which extends about ten miles further. It is situate in Townships 46, Ranges 19 and 20, west of 3rd Meridian, in a beautiful tract of rich farming country on the south side of the Saskatchewan. This settlement suffered much during the trouble in spring of 1885, and this excessively dry season has prevented those here putting in much crop. From here to Fort Pitt over sixty miles of excellent farming and stock-raising country intervenes. Being occupied at several places along the way and on both sides of the river we did not reach Fort Pitt until 20th October. Of the old buildings formerly within the stockade here only two remain—one used as a store, the other as a dwelling by the Hudson Bay Company's officer in charge. A fine large new dwelling is in progress, and material is being got ready for other buildings. At a short distance, on the bank of the river, is a small frame house intended as a telegraph station. A new telegraph line from Battleford to this place is nearly completed; the poles for thirty miles or more are of iron imported from England. They are intended as an experiment. On the prairie wooden poles are very liable to destruction by prairie fires and by lightning. A small detachment of mounted police have been, during the summer, stationed on the Indian reserve at Onion Lake, twelve miles north-west of Fort Pitt.

Leaving Fort Pitt on 25th October, we proceeded to Beaver Lake, part of the route being along the old telegraph line from Ranges 2 to 11, west of 4th Meridian. For about forty miles, to the Blackfoot Hills, most of the country is very suitable for farming. In the hills, although the soil is good, the country is too rolling for farming, but is most admirable for stock. Lakelets and ponds of good water are numerous. West of Fort Pitt, on and near the Vermillion River (especially Townships 52 and 53, Ranges 2 and 3, west of 4th Meridian) there is a beautiful tract of farming land, consisting of long gentle slopes, with small lakes of very good water in the hollows, with hard shores, while good timber is to be had at convenient distances.

From Birch Lake, in Ranges 11 and 12, west 4th Meridian, westward, the country becomes more level and exceedingly fertile, and the grass longer and more abundant. It would be indeed difficult to find richer soil or better farming or stock-raising country than that from Range 14 westward to and about Beaver Lake, comprising about five ranges, and I am informed that it extends from the North Saskatchewan, in varying width, south to Battle River.

Some of the settlers about Beaver Lake who left in the spring of 1885 have not yet returned. I have no doubt that in the near future, as soon as railway facilities are brought within a reasonable distance, giving the prospect of a market, this tract of country will be rapidly occupied by settlers; a beautiful region, with the richest kind of soil, fine meadows, abundance of good water, fencing and fuel convenient, while the Beaver Hills westward will yield a vast amount of lumber and building material.

Leaving here on 6th November, and crossing at Fort Saskatchewan, we reached Edmonton on the 9th. From Edmonton our duties took us north-west up the

Sturgeon River about twenty-four miles, and south-westerly up the Saskatchewan to Range 2, west of 5th Meridian. On the way from Edmonton to Calgary we stopped two days at Blind Man's River, and arrived at Calgary on the evening of the 24th December. I there delivered the outfit to Mr. John Lineham, according to instructions, and there discharged most of the party. Left Calgary on the evening of 25th and arrived at Winnipeg on the 27th.

In the settlements about Edmonton, St. Albert and Fort Saskatchewan, although the past season was considerably drier than usual, the yield of all kinds of crops was much better than for many years past, both in respect of quality and quantity, that of potatoes, turnips and other roots being enormous. In potatoes there were many specimens of over three pounds in weight, a few of four, and one of over five pounds, all, too, in single solid smooth potatoes, not an aggregation of two or more accidentally grown together. In one instance where the ground was said to have been carefully measured, wheat yielded forty-one bushels to the acre; barley, sixty-eight; and oats, one hundred and fourteen. Some other yields of wheat were reported, showing a greater increase, but as no actual weights were taken I took no note of them. At Stony Plain, about seventeen miles west of Edmonton, I bought a few bags of potatoes from a farmer, and I never saw better in my life, either in appearance or quality. They were so large that I asked him to give me his smallest ones, and my cook cut some of those in pieces when putting them on the fire to boil.

The settlements are extending in all directions. Settlers' houses are dotting the road all the way to Calgary, about two hundred miles, the greatest distance now without a house being only twenty miles. In addition to the settlements rapidly extending along the Red Deer and Battle Rivers, a number have, this past season, settled on the Blind Man's River (or Blind River, as some of the people call it, from the Indian name Pas-kah-pe-we-si-pi), in Township 39, Range 27, west of 4th Meridian. In Edmonton a large number of new frame dwellings, and one of brick, have been put up, and the town has the appearance of considerable prosperity. At St. Albert several very large and splendid frame buildings have lately been erected at the mission, and a number of smaller ones in the village.

I collected no details of any business or industry. A great many are represented, and there is room and need for a great many more.

A new telegraph line has been completed to Victoria, on the Saskatchewan, between fifty and sixty miles below Fort Saskatchewan, and an office opened there. It is intended next year to continue the telegraph line on the north side of the river down to Fort Pitt.

I have the honor to be, Sir,

Your obedient servant,

JOSEPH DOUPE,
Dominion Land Surveyor.

The Surveyor General,
Department of the Interior,
Ottawa.

No. 5.

REPORT OF OTTO J. KLOTZ, D. T. S.

SURVEY OF CANADIAN PACIFIC RAILWAY LINE IN BRITISH COLUMBIA, AND DETERMINATIONS OF LATITUDES AND LONGITUDES.

PRESTON, 7th January, 1887.

SIR,—I have the honor to submit my report of survey of the Canadian Pacific Railway from the summit of the Rocky Mountain Range to Revelstoke, on the Columbia River, and of the astronomical work carried on in British Columbia and the North-West.

In compliance with instructions under date of 3rd April, 1886, I proceeded to the initial point of the survey at the summit of the Rocky Mountain Range, arriving there on the 6th of May, and found winter still holding sway at that altitude—5,300 feet above the sea.

Passing over the vast stretch of prairie west of Winnipeg, about 900 miles in length, the weather was mild and the snow all gone. At Medicine Hat it was learned that potatoes had been generally planted as early as the 7th of April. It may be noted that in this vicinity spring opens earlier than anywhere else in the same latitude (50°).

Passing through Calgary, it may not be out of place to say a few words regarding it. Four years previously I had visited the site, then a mere trading post. It is most picturesquely situated in the valley of the Bow River, at the confluence of the Elbow River with the former. There are some fine brick and sandstone buildings erected in the town, the stone being quarried on the river bank. There are numerous stores, two saw-mills, besides banks, schools and churches; and from Calgary a great deal of freighting is done for Edmonton and other northern points. The valley is fertile agricultural land, and the adjoining bench lands are covered with nutritious grasses, well adapted for roots and vegetables and stock-raising. This latter circumstance makes Calgary the principal shipping point for cattle. A British Columbia rancher speaking to me about the merits of this vicinity for cattle, with special reference to the winter, said: "I tell you if you find a place where it isn't common to have sleighs, I think that a pretty good sign for cattle." He has now transferred a part of his herd of cattle from British Columbia to the east slope of the mountains, where, moreover, water is more abundant and better. Altogether Calgary is a very thriving town, and it is questionable whether any other place in the Territory has a brighter future before it.

We ascend the picturesque valley of the Bow, which gradually narrows, until we are surrounded by mountains. In them we find Canmore prettily situated in a level expanse of about three-quarters of a mile. The most interesting feature here are the three conglomerate columns (one is a symmetrical cone) standing together on the side of a hill, about 50 feet above the plain, and themselves about 30 feet high. The mass is a coarse gravel, with boulders, and, although cemented, is somewhat friable. A cursory examination showed no shells therein. The hill is covered with grass, and appears to be gravelly also. That these peaks have been left after the action of flowing water seems most probable.

Before reaching the summit, Banff is passed, near which are the Hot Springs, which are already becoming noted for their curative powers. There is the wild, rugged scenery surrounding them, the beautiful Bow meandering through the mountains, and whose waters afford recreation for boating and canoeing, the cave and basin and a multitude of favorable circumstances to attract both invalid and tourist.

As before stated the summit was reached on the 6th of May, and here the survey began, which was to be the connecting link of 140 miles between the surveys carried from the east and that carried from the Pacific coast, to form one continuous connected system of 1,600 miles. The special survey of the Canadian Pacific Railway through the mountains by the Government was necessitated in order to continue the system of land surveys of the North-West, as it is impracticable to carry that system over the mountains by projecting base lines and meridians. Thus the Canadian Pacific Railway was made to serve as a base line for any survey along the same that may be required in future. And as the relative position of townships and ranges depends upon their geographical co-ordinates, the latter were supplied by the astronomical work of which I had charge, by observing at various places along the line.

The instruments used for making the traverse survey of the Canadian Pacific Railway, or more correctly speaking the deflection survey (as by traverse survey is generally understood a rapid and expeditious survey of a stream or shore line, using a compass and Rochon micrometer, or for better work a repeating instrument) were a 6 inch decimally graduated reiterative transit with three verniers, of Troughton and Simms; a 66-foot steel band chain; a standard 100-foot steel band used only for comparison; a chirometer; a thermometer for ascertaining the temperature of the chain and reducing the length thereof to the normal of 60° F.; and a Lugeol micrometer with its target rod for checking the chaining for bulk errors. The above transit read to $^{\circ}004$, and by inspection to $^{\circ}002$. It is provided with a small vertical circle reading to $^{\circ}02$, chiefly used for setting off the altitude when making stellar observations. Besides the diagonal eye-piece it has several other eye-pieces, all inverting. In general the power of 20 was found most serviceable. The superiority of the inverting over the erecting eye-piece is too well known to require further elucidation here. The same may be said of the repeating and reiterative instrument. Of the two instruments of equal workmanship, the latter would even be preferable from a mechanical point of view, being composed of fewer parts. The telescope has an aperture of $1\frac{9}{16}$ inches, whereby Polaris can be observed during day time, although rarely at mid-day. The decimal graduation of the instrument is a stride towards simplification in computation, and will in time undoubtedly supplant the graduation into minutes and seconds. The trussed tripod with its broad head for the three levelling screws is to be commended too for its greater stability. The Lugeol micrometer used differs from the Rochon in having its object glass cut in halves, which are moved in opposite directions by a micrometer screw. The targets are fixed upon a rod, and the visual angle subtended by them is measured by displacing the halves of the object glass by the micrometer screw until the image of the upper target, as seen by the one-half of the object glass, coincides with the image of the lower one as seen by the other half; the number of revolutions of the screw are read off on a scale, and part of a revolution on a graduated head.

THE WORK.

Before beginning the survey proper it is necessary to ascertain the latitude of the initial point, say within a minute, as the latitude enters into the computation of the azimuth. It may be readily obtained from the altitude of the sun, Polaris or other star at transit; or when having a sidereal pocket chronometer, by transit of a star across the prime vertical (the same star observed both east and west when near the zenith is preferable); or by observing Polaris at any hour angle, when table IV on the last page of the American Ephemeris may be applied (which gives the distance above or below the pole for every five minutes of hour angle) and the desired latitude found. These four methods were used on the work to suit the circumstances at the time.

In azimuth work the absolute longitude of the place does not form so important a factor as the latitude. Its importance is principally confined to determining the declination of the sun, when observing on that body. Good azimuth work can only be done by stellar observation, for which Polaris is almost exclusively used, and not by observing on the sun. From my experience I place little reliance upon the rate

of a pocket chronometer, subjected, as it unavoidably is, to many vicissitudes, and hence always observed for time, when possible, immediately before or after the one for azimuth. The time observation was made by observing Polaris and then another star in the same vertical plane. The Nautical Almanac or American Ephemeris furnishes a sufficient number of stars for this purpose. Having thus the sidereal time well determined, with a well adjusted instrument good azimuth work can be done whatever the hour angle of Polaris. A source of error in azimuth work, when precision is aimed at, results from torsion, and care should be exercised in turning the instrument from one reference object to the other never to turn it "past" and then back, and furthermore always to take at least two readings in full of each of the three verniers, one turning the instrument to right and one to left. There is torsion in every instrument, in some to a greater, in some to a less degree. In the particular instrument under discussion the maximum torsion was reached by three complete continuous revolutions, when it amounted to 0.014 ; thereafter it was inappreciable. Each vernier should be read under the same condition of light, that is shaded, and with microscope well adjusted.

At each station twelve vernier readings were taken, six for foresight and six for backsight; the mean of the latter subtracted from the mean of the former gives the deflection, which is reckoned to the right and up to 360° . Besides the discrepancies that may arise from centering over station, pointing, inaccurate vernier readings or torsion, there is another one—that caused by the disparity of distance between the fore and backsight, whereby it is necessary to change the focus of the telescope. If the tube does not move parallel the line of collimation will be changed, and thus affect the true deflection. Unless the difference of distance was large I preferred not changing the focus.

Some sights were very short, less than three chains. The tunnels are mostly all on curves, and in many artificial illumination had to be resorted to for seeing picket and cross-hairs. A day's good work would be to occupy 25 stations.

I have found by experience that, starting with an observation on Polaris for azimuth, and thereafter occupying, say, 75 to 100 stations, the azimuth of the last course deducted from the deflections, allowing for convergence of meridians, will be more nearly the true value than one obtained by direct observation of the sun for that course. Nevertheless, solar observations were frequently taken, simply as checks on the work, especially when the weather was unfavorable for observing Polaris, but never for determining the absolute azimuth of a line.

Micrometer readings were taken at each station as a check upon the chaining. The bases on the micrometer target rod were 10 and 15 links. The opal glass targets were found to serve their purpose well, being visible when judiciously turned for any position of the sun. In using the micrometer it was found convenient to rest it upon the top of the transit. In this, as with the other instrument, uniformity of use was adhered to, viz., forward motion to contact read, then past and back to the other contact, thus destroying the effect of lost motion, if any, between the two readings. The difference between the two readings gives twice the number of revolutions for the visual angle from which the distance is deduced. For long sights the operation was repeated.

At the beginning of the survey a base line of 30 chains (the longest available there) was carefully measured twice and divided into 5 chain spaces, at the end of each of which numerous micrometer readings were taken, which served the purpose of constructing a table from which the value of any subsequent reading could be taken by inspection. At the close of the survey a redetermination was made, to ascertain whether any change in the value of the micrometer screw had taken place by use. In this redetermination readings were taken including and excluding lost motion (if any). I subjoin the three tables Nos. 1, 2 and 3, also a list of readings taken at random out of the field books and their corresponding chained distances. During the survey three errors in chaining were detected by the micrometer, one of a chain plus, one of a chain minus, and the other having been read from the wrong end of the chain, 45 instead of 65 links:—

OBJECT GLASS OVER STATION.

Table 1.

Table 2.

Table 3.

Distance.	Revolutions.		Distance.	Revolutions.		Distance.	Revolutions.	
	15 lks. Base.	10 lks. Base		15 lks. Base.	10 lks. Base.		15 lks. Base.	10 lks. Base.
Chs.			Chs.			Chs.		
1	33.5400	25.7025	1	38.3650	25.6450	1	38.3225	25.6425
2	19.2700	12.8512	2	19.1825	12.8225	2	19.1612	12.8212
3	12.8467	8.5675	3	12.7883	8.5183	3	12.7742	8.5175
4	9.6350	6.4256	4	9.5912	6.4112	4	9.5806	6.4106
5	7.7030	5.1405	5	7.6730	5.1290	5	7.6645	5.1285
6	6.4225	4.2873	6	6.3962	4.2758	6	6.3910	4.2752
7	5.5050	3.6748	7	5.4825	3.6680	7	5.4780	3.6645
8	4.8169	3.2155	8	4.7972	3.2069	8	4.7933	3.2064
9	4.2817	2.8582	9	4.2642	2.8506	9	4.2607	2.8501
10	3.8530	2.5745	10	3.8390	2.5665	10	3.8370	2.5660
11	3.5070	2.3419	11	3.4891	2.3370	11	3.4875	2.3278
12	3.2148	2.1468	12	3.1983	2.1331	12	3.1969	2.1339
13	2.9675	1.9813	13	2.9523	1.9390	13	2.9510	1.9697
14	2.7555	1.8401	14	2.7414	1.8284	14	2.7403	1.8290
15	2.5750	1.7185	15	2.5580	1.7020	15	2.5570	1.7035
16	2.4123	1.6140	16	2.4006	1.6009	16	2.3986	1.6007
17	2.2704	1.5199	17	2.2594	1.5063	17	2.2575	1.5065
18	2.1443	1.4347	18	2.1339	1.4231	18	2.1321	1.4228
19	2.0314	1.3591	19	2.0216	1.3482	19	2.0199	1.3480
20	1.9285	1.2935	20	1.9225	1.2850	20	1.9200	1.2835
21	1.8386	1.2314	21	1.8321	1.2729	21	1.8265	1.2228
22	1.7550	1.1755	22	1.7489	1.1673	22	1.7435	1.1672
23	1.6787	1.1243	23	1.6728	1.1166	23	1.6677	1.1165
24	1.6088	1.0775	24	1.6031	1.0701	24	1.5982	1.0699
25	1.5460	1.0340	25	1.5400	1.0265	25	1.5335	1.0275
26	1.4897	.9941	26	1.4788	.9362	26	1.4755	.9852
27	1.4335	.9573	27	1.4241	.9497	27	1.4209	.9487
28	1.3823	.9231	28	1.3732	.9158	28	1.3701	.9149
29	1.3347	.8913	29	1.3259	.8842	29	1.3229	.8833
30	1.2920	.8615	30	1.2800	.8540	30	1.2805	.8515
			31	1.2375	.8265	31	1.2408	.8247
			32	1.1988	.8006	32	1.2021	.7989
			33	1.1625	.7764	33	1.1656	.7747
			34	1.1283	.7535	34	1.1314	.7519
			35	1.0950	.7320	35	1.1005	.7310
			36	1.0684	.7158	36	1.0744	.7137
			37	1.0395	.6935	37	1.0454	.6944
			38	1.0122	.6732	38	1.0179	.6761
			39	.9862	.6608	39	.9918	.6588
			40	.9650	.6480	40	.9710	.6450

In these tables no second interpolations were made, which in a rigorous computation would be applied. Table I was deduced at commencement of survey, when the instrument was new, and tables II and III at close of survey. With Table II there is right and left motion of screw to contact "not past;" with Table III there is right and left motion of screw to contact the reading taken, then turned "past" and reversed, to eliminate lost motion, if any, in head of screw. A careful redetermination of the target rod at the end of the survey showed the wood to have shrunk longitudinally, on the 15-link base, one-thirtieth of an inch, and on the 10-link base, one-fiftieth of an inch. To compare Tables II and III with Table I the small correction resulting therefrom should be applied.

TABLE IV.

Stations.	Chained Distance.	Micrometric Distance.	Stations.	Chained Distance.	Micrometric Distance.
	Chains.	Chains.		Chains.	Chains.
39-40.....	10·375	10·388	376-377.....	3·625	3·613
98-99.....	9·948	9·959	672-673.....	4·669	4·673
113-114.....	3·750	3·754	701-702.....	15·665	15·676
178-179.....	14·623	14·650	714-715.....	22·217	22·188
182-183.....	25·043	25·024	735-736.....	13·508	13·481
211-212.....	19·026	19·000	798-799.....	35·503	35·494
254-255.....	4·835	4·814	1020-1021.....	7·822	7·824
262-263.....	4·146	4·145	1030-1031.....	3·485	3·491
347-348.....	11·315	11·341	1045-1046.....	10·468	10·402
355-356.....	16·620	16·598	1062-1063.....	27·939	27·966

Table IV gives a number of distances as measured by the steel band, and the ones as deduced from the micrometer readings. They have been taken at random out of a number of field books. There were very few long sights on the whole survey, and there were a few instances when the heat was so great that the micrometric readings could not be depended upon on account of the apparent unsteadiness of the targets. The table represents, I think, what may be expected of this form of micrometer under ordinary favorable circumstances including care in reading. Reducing the measurements to the standard of 40 chains, then from the residuals we find the probable error of one measurement of 40 chains to be ± 0.058 chains, say 6 links per 40 chains.

The actual and micrometric distances in the above table agree better undoubtedly than if the measurements were made over hills and rough ground, where reduction to the horizontal would be necessary, and errors would arise from differential refraction. But over very rough ground I would place more reliance upon the micrometer than upon ordinary chaining. It must be remembered, however, that on the survey the micrometer was only used as a check for bulk errors, and when used on exploratory surveys (as used by me to Hudson's Bay, in 1884) for determining the absolute distance and no chaining is done, more readings and additional care are taken, and its merits more fully realized.

The temperature of the chain was generally taken four times a day, and the corrections made for the standard of 60° F.

The largest correction for grade on the railway was one-tenth link per chain; this was only on a short distance on the heavy grade (4½ per cent.) on the west slope of the Rocky Mountain Range, near Mount Stephen. A table for grade corrections was prepared so that the necessary quantities could be taken out by inspection. The topography was noted by the assistant who had charge of the chaining.

Azimuth readings were taken on prominent mountain peaks, also their elevation, and in both positions of the instrument, circle right and circle left. In determining the height of a mountain from various points there are two sources from which differences in the results are likely to arise. The most apparent of the two is the difference of level between the points of observation, the other one to which especial reference is desired to be made, is the fact that the apparent highest peak as seen from one station is not the apparent highest peak as seen from another station, and thereby causing a disparity in the results which may readily amount to 100 feet. The majority of mountains have not one single isolated peak towering above all others, but there will be a number of peaks, and the closer one is to the mountain the greater the probability that the really highest peak is hidden from you, as shown by many instances on the survey.

The same remark applies to their triangulation. Azimuth readings from two known points should be sufficient to locate a peak, but on account of the uncertainty of sighting the same point on the mountain from each of the two stations, it is best to take readings from other points, and then accept for the most probable position the centre of gravity of the intersections of the various lines when plotting the work.

The following are the heights, above the railway, of the principal peaks along the line of survey, as determined by me; but the heights above the sea of the various triangulation points on the railway, were furnished me through the kindness of the Canadian Pacific Railway engineers:—

Name.	Above C.P.R.	Above the Sea.
	Feet.	Feet.
Mount Stephen.....	6,474	10,523
Cathedral Mountain.....	5,960	10,284
Mount Dennis.....	3,922	7,971
Mount Field.....	4,505	8,554
Mount Russell.....	5,272	9,321
Mount Carnarvon.....	4,827	8,876
Mount Macdonald.....	5,558	9,440
Mount Tupper.....	4,983	9,063
Mount Sir Donald.....	6,980	10,645
Ross' Peak.....	3,951	7,616
Mount Regbie.....	7,339	9,005
Mount Cartier.....	6,909	8,576
Mount Macpherson.....	6,390	8,057
Mount Mackenzie.....	5,896	7,563
Mount Tilly.....	6,109	7,776

As these mountains, prior to the last few years, were totally unknown, names had to be assigned to the most prominent ones at least. The Canadian Pacific Railway engineers gave a number of names, and all of them, as told me, I retained and embodied in my field notes; still there were a number yet undesignated which I triangulated, and as I am the first one to locate them accurately, I took the liberty of giving them names.

GENERAL NOTES.

A marsh or lake is generally found at the summit of a mountain range, and frequently discharging its water down both slopes, in opposite directions. At Stephen, the summit of the Rocky Mountain Range, a marshy expanse was found which has no natural outlet, but, since construction of the railway, drains to the west. When at the summit (5,200 feet above the sea), storms were noticed to come up from each side, but principally from the west. One afternoon (10th May) while at my instrument, I saw two snow storms simultaneously approaching me, and while it was snowing heavily 100 feet from me on each side, no snow was falling where I stood; the next moment the two currents met, fought for the ground, and the western one carried the day; but shortly afterwards the eastern one, apparently reinforced, shoved the other one back again. Thus here is a battle ground upon which contending forces of one of the elements are waging war.

From 9th to 12th May, inclusive, thirty-six inches of snow fell, and shortly thereafter warm weather set in causing numerous avalanches and small snow slides, so that for some days there was a constant rumbling and thundering, with its attendant reverberations among the mountains caused by the falling snow, oftentimes carrying huge masses of rock in its mad career down the mountain side. A tremendous crash would be sent forth when the falling mass would strike timber (the beginning of the avalanches would nearly always be far above the timber line.) Trees would be cut down like straws, but fortunately here no danger to the railway is to be anticipated from this source. The avalanches are influenced in their course

by the deposit of snow, configuration of the mountain, and by the prevailing wind which starts them; yet the most descend in old places, and little damage is done to timber.

In consequence of the melting snow many waterfalls and cascades were formed which disappeared in mid-summer. Of the former, falls were seen over 3,000 feet high on Mount Stephen; with many of them the water never reached the bottom, but disappeared in mist, as we found to our regret one day when the picketman was despatched for our tea, we saw the water falling from a great height, but when he got under it there was no water to be seen. On this same mountain an apparently small ledge of ice with vertical face may be seen from the railway, but on measurement it was found to be 200 feet thick.

Cathedral Mountain which adjoins Mount Stephen to the east is very picturesque, and owes its name to its outline as projected against the sky.

The railway descends the west slope of the Rocky Mountain Range to the Columbia River along the Wapta River, crossing and recrossing it nine times.

The whole of the country under consideration now (140 miles of survey) is very mountainous and densely wooded. It includes the west slope of the Rocky Mountain Range and the whole of the Selkirks. In the former the timber is not so large as in the latter; a more detailed description thereof will be given further on. Wishing to see the country from an elevation an ascent was made opposite to Field. The dry bed of a creek afforded the easiest means of gaining the top. The woods on each side of the creek for the first 1,000 feet of ascent were chiefly spruce, balsam, with some pine, birch and cottonwood; some of the first named trees measuring upwards of 25 and even 30 inches. The soil was clay formed from decomposition of the shale. Near the timber line some of the trees had large trunks, probably 18 inches in diameter, while they were not more than three feet high, and seemed to have been flattened down, pointed on the heel and shoved down hill by snow and rock sliding over them. At a high altitude, approaching the timber line, a peculiar bright yellow moss was found covering the dry limbs of trees, giving a very pretty effect. About two hours climbing brought us to the summit of the ridge, 3,200 feet above the valley, which altitude—7,200 feet above the sea—is just above the timber line. From the height reached a splendid view was presented. All around were snowy peaks, various ranges could be discerned, lakes seen, valleys and streams could be traced, far distant peaks recognized and numerous glaciers counted. Looking to the north across the valley and on to the opposite slope two or three large glaciers were seen. They feed a lake, probably 40 by 60 chains in extent, which lay in the valley but still high above the level of the river at Field. This lake was drained by the North Wapta River, which flowed south-west and entered the south branch near the mouth of Boulder Creek. Another and seemingly larger stream lay to the north-west of this one and entered the Wapta River a few hundred yards to the west of the junction of the two branches. This stream was separated from the north branch by a low wooded ridge which rose higher as it ran north; beyond lay another ridge and stream, and beyond all lay the Van Horne Range to the south-west, the two chief peaks in which are Mount Russell and Mount Carnarvon. Looking to the south there is a range of high mountains, the peaks of which appear to carry more snow than any of the others in sight. They are the Ottertail Mountains, the principal one of which is Mount Goodsir. Turning still further towards the east we see Mount Dennis with its cleft peak, and beside it Mount Stephen towering above all others. We look into the east slope of the mountains (being here 10 miles down the west slope) and see Castle Mount and other peaks east of Laggan, as well as the nearer Wapta Lake and course of the river. Before descending a number of photographic views were taken.

On Mount Stephen, in a thick bed of shale, an endless quantity of well-preserved fossils were found, principally trilobites and agnostus. The bulk of the mountain mass is limestone overlying quartzite. Galena is found in large quantities in this mountain, and a small beginning in mining it has been made.

The grandest single mountain mass along the whole transcontinental line is Mount Stephen, at the foot of which lies the station Field. Here the railway com-

pany has lately erected a neat hotel especially for tourists. About three miles above Field, and near the tunnel, the river valley widens into a broad gravel flat, through which the water runs in numerous small streams (except in very high water), separated by gravel bars. A most suggestive idea is here forced upon one. As this place offers some of the wildest, grandest and most awe-inspiring scenes in the whole mountains, the hand of art could, at a comparatively small cost, add additional beauty by changing this unsightly gravel flat into a lake, creating a scene beautiful amidst the sublime. The draining of the river at the gorge would necessitate raising the track a short distance, but as the grade there rises in both directions, the change would be rather beneficial than otherwise. At present, other riparian rights there are none. The scheme is so feasible and of such moment that its consummation can only be a question of time.

We saw a fall of rock from Cathedral Mountain. It came from a great height—several thousand feet—and hundreds of tons fell in a mass from the fall of the cliff, from which it had been loosened probably by frost. As it dropped forward it broke into fragments with a loud report, and for a time seemed suspended in mid-air, then rolling down the steep slope started other fragments of rock and stones and snow on its way, finally landing in a swamp and sending up a large dense white cloud resembling discharged steam.

After passing the flats at Field, the railway leaves the river and ascends a gently-sloping ridge. After descending it crosses Ottertail Creek, a rushing mountain stream. In this vicinity some rich finds of silver ore have been struck, and an effort is being made at mining the same; but here, as elsewhere in British Columbia, there appears to be a lack of capital to successfully carry on mining operations, and thus frequently a development justified by natural resources is not obtained. In the adjoining valleys there is some good merchantable timber, and a saw-mill has been erected for cutting the same.

Ottertail Creek flows into the valley of the Wapta, and runs alongside of that river for about two miles ere it joins it. This peculiarity of streams has frequently been noticed. The track crosses the streams near their junction, and continues along the north side of the valley, which is marshy and probably half a mile wide. At its west end can be seen the only other glacier noticed from the railway in the Rocky Mountain Range west slope, besides that on Mount Stephen. As yet not a great deal of continuous rock-work has been encountered. Before reaching the next siding, Leancoil, Pine Creek is crossed, along which spruce of 20 inches in diameter was noticed. For a short distance the railway passes through a shale ledge, on the broken slabs of which considerable difficulty was experienced in setting up the instrument, especially in centering the same, not being provided with an adjusting tripod head.

Shortly after leaving Leancoil, the railway leaves the river and makes an abrupt turn to the right or west, whereas the valley continues due south. Closer examination shows that the distant part of the valley is that of the Beaverfoot River, which empties in the Wapta; after several miles we regain the river but find the track high above it. On the part of the river thus avoided are the Wapta Falls, said to be 40 feet high. After again striking the river we noticed that the hills rise from it in benches of varying heights, and that it has high clay cut banks.

These benches are covered with timber of fair size, up to 30 inches in diameter, but a great deal of it on both sides of the river is fire-killed. At Palliser Station the river bottom widens to about 15 chains, and the track is near the river level. It runs close to the foot of a bench about 80 feet high, which runs back about 50 chains. This bench is level, the timber thereon large but dead, and the soil is good. The timber here is chiefly hemlock, and is reported as making especially good fuel.

After leaving Palliser the track enters the canyon, and at survey station 298 we noticed a high ridge of shale which undoubtedly crossed the pass at one time, as the formation is the same on both sides of the river. The cliffs are about 300 feet high, and have the appearance (detrition by water) of having once formed the dam which caused the benches to be deposited higher up the stream. The bench formation does

not end here however, but appears at intervals further down the river, which becomes narrow and soon enters the lower Wapta canyon, where the gorge is contracted, the river rapid, and the walls very steep bring even perpendicular in places. Where they are sloping and carry soil, the banks are covered with evergreens, which, though not of value as timber, add very much to the beauty of the scenery. The heat experienced in the canyon where the rays of the sun are reflected by the bare rock walls was most intense, and we were almost overcome thereby.

The "tote" road which was built through the mountains for construction purposes and preceded the railway, is almost as interesting a piece of engineering as the railway itself. Here it is seen in the bottom of the valley, there it climbs the mountain to dizzy heights, crossing chasms or rushing streams over rude bridges, again it passes along vertical cliffs through niches blasted out of the same, and finally regains the level of the track. Having served its usefulness it is fast being wrecked by the agencies of nature.

Neither the river nor its valley expands in its downward course as anticipated, but quite the reverse is the case, until at the gateway—Golden Gate—of the Wapta, lined with high vertical walls of rock, the beautiful vista of the Columbia Valley, with the Selkirks in the background, bursts upon our view.

Golden City is situated near the confluence of the Wapta and the Columbia. There is nothing visible here to suggest the name of the place. Good silver leads are said to be in the neighborhood. There is little winter here, the prevailing Chinook winds melting the snow rapidly. A marked contrast exists between this place and Donald, sixteen miles down the Columbia (north); there the winter is quite severe, and while at the latter four feet of snow were lying last April, there was none at the former. Cereals, fruits and vegetables thrive in this vicinity, and some fine farming land is said to exist on the benches north of the railway, and well worth subdividing.

A small steamer is now plying between Golden City and the Upper Columbia lakes, to the great convenience of settlers.

Of Indians, not many were seen, except wandering Kootenays or Shushwaps, principally the former.

A very marked difference in the vegetation is noticed when the Columbia Valley is reached, being more varied and more luxuriant than along the Wapta, which is attributable to the warm humid atmosphere which is prevalent throughout the whole of the Selkirks. Roses, vetches, orchids, lilies, as well as many other flowering plants, and especially ferns, grow in profusion. The wood is mostly fir, some balsam, birch, ash and poplar. The valley proper of the Columbia is about a mile wide, but including the foothills about ten miles. The river meanders through many channels, forming many islands, and is in consequence shallow until Donald is reached, where it is only about a hundred yards wide, and confined within high banks. Salmon ascend the Columbia from the ocean to the Upper Columbia lakes, the head waters, a distance of about 1,500 miles, where the Indians spear them.

In the valley of the Columbia we found quite a number of squatters, who are anxious for the land surveys to be made, to enable them to make entries for the land. As we pass along the valley we are struck by the contrast between the Rockies and the Selkirks; the former are wild, rugged and scattered, seldom showing a range, and when they do so, there are various ranges running in different directions, and the peaks are dull bare rock; the latter appear in long ranges and have an even regular serrated outline as projected against the sky, and besides are more heavily wooded, the dark green foliage of the evergreens making them especially picturesque.

The railway follows the east bank of the Columbia, from Golden City to Donald. Six miles from the former place is Moberly House, where some very nice vegetables were seen, and, although the spring this year was three weeks later than last year, potatoes were planted on the last day of March. The river was clear of ice on the 21st of March. A few miles farther, Blaeberry Creek, a good sized stream, is crossed, in the valley of which there is some valuable timber. Marketable timber grows to an altitude of nearly 6,000 feet, while the timber line extends fully a thousand feet higher.

Donald is well situated on a high bench above the Columbia, 2,539 feet above the sea; it is essentially a railroad town, being a divisional point and having the car and workshops. Here we cross the river, which now grows narrow, with steep, rocky banks for seven or eight miles, when the valley widens again and low timbered benches appear, alternating from one side of the river to the other, with the bends in the stream. About two miles before reaching Beaver Creek, the valley widens still more and the flats are covered with large cedars, thirty to sixty inches in diameter.

On striking Beaver Creek the track turns sharply up along it, and plunges into the Selkirks. The creek is about 100 feet wide, and at the "gateway" only 20 feet, where it flows between two upright slabs or blocks of rock of considerable height. A fall just above it gives it a very picturesque appearance. Every turn of the railway and creek disclosed new scenes and fresh beauties.

At Six Mile Creek, a rapid mountain stream, we leave the level of Beaver Creek although continuing in its valley, and begin ascending along the mountain side, crossing numerous ravines with high bridges. The gorges are thick with ferns and flowers, through which merrily speeds the silvery thread. The bridge across Stony Creek is said to be the highest wooden one in the world, being about 500 feet long and 294 feet above the bed of the ravine. From the bridge tender, who spent the past winter there, I learned that the winter was mild, the most snow falling in January and February, coming down in large fleecy flakes, and when deepest lying 6 feet on the ground. There was not much rain in the spring, the snow going off gradually, and in consequence comparatively few snow slides occurred, although some days up in the mountains there was a continuous rolling and thundering theretom. It was scarcely ever necessary to wear gloves or mittens. The storms invariably came from the south, that is from the head of the valley. Having risen along the mountain side on a grade of 2.2 per 100 feet, we noticed that the woods are perceptibly of smaller sized timber than we saw lower down, but still of good size, say up to 24 inches in diameter.

Upon entering Rogers' Pass, which leads us across the summit of the Selkirks, we leave the valley of Beaver Creek, above which we are now many hundred feet, and ascend a small stream, Bear Creek, which is fed from a glacier. The pass is narrow, only affording room for the creek and railway, and on each side rise stupendous mountain masses, that on the south side being Mount Macdonald, towering over a mile with almost perpendicular wall above the track, while on the north side rises Mount Tupper to nearly the same height.

The climax of grandeur in the Selkirks is at the summit. Mountain, rock, peaks, ice, snow, glaciers, cascades, streams, and the richly clothed valley, present a panoramic scene that can never be effaced from the memory. This summit of the Selkirks is just 1,000 feet lower than the corresponding point in the Rockies, being 4,300 feet above the sea.

Close observations made during the past winter (before the road was open for traffic) by the Canadian Pacific Railway engineers, showed that in the west slope ten snow slides occurred, the first being on the 29th of January, and the last on the 4th of April. The greatest amount of snow on the track from them was 18 feet in depth, and the greatest quantity about 5,000 cubic yards. The weight of the snow-ice, after its descent, varied from 24 to 46 pounds per cubic foot. It was estimated that the maximum velocity attained was from 80 to 100 miles per hour.

The very summit itself is a marshy flat, similar to the one on the Rockies, and considerable misty, rainy weather prevails. With the descent down the west slope we immediately begin following the Illecillewaet, which here is a mere creek fed by glaciers north of the track. About two miles west of the summit is "The Glacier," excelling in magnitude all others. Its extent, and thickness, and motion, and many other data of scientific interest must be left for future determination. This remark applies equally well to many other questions concerning the mountains, where so large an extent of a hitherto *terra incognita* has been opened so suddenly. Near the foot of this glacier the Canadian Pacific Railway Company has erected a handsome tourists' hotel.

It was noticed that the water of all the creeks where they emerged from glaciers was of a milky color. There was neither clay nor any other material visible whereby this discoloration became apparent.

An interesting piece of engineering is The Loop. Here, in order to descend into the valley, the track runs up the ravine of a small creek, crosses the creek on a small bridge and runs down the other bank of the ravine. It then recrosses the ravine over a high and long curved trestle bridge, striking the ravine where the loop began over a hundred feet below the other track and only 150 feet from it, having come one and a half miles and made no headway west. Thus it winds about in order to obtain the proper grade, which averages 2.1 per 100 feet. Standing at this bridge four tracks are seen one above the other, and it is not at first sight apparent that they are one and the same railway line. From the end of the loop to the summit is three miles by the "tote" road, but by the railway, seven miles.

As we descend the valley we begin to meet large timber, pine has disappeared, and spruce, hemlock and cedar are the principal woods, especially the last, and when Albert Canyon is reached cedars over ten feet in diameter are seen, but these taper rapidly, and the very large ones are always hollow; still, the average tree is large and sound. Soon after passing Illecillewaet Station, 18 miles from the summit, the valley narrows into a gorge with rounded hills on the south side, and to the north the mountains rise in benches which are timbered with cedars from three to six feet in diameter. This ends at Albert Canyon where the river rushes through a very narrow rocky channel several hundred feet deep. Shortly before reaching the canyon the track crosses the river, and close by is a strong soda spring, and hot springs, similar to those at Banff, are reported to the south of Albert Canyon Station upon the mountain side.

Mention must be made of a shrub which grows plentifully in the Selkirks, and is also met in the Rockies—the Devil's Club. It has a stem about two inches in diameter, grows six feet high, and has an umbrella shaped crown of leaves. Both the stem and the under side of the leaves are thorny. The thorns are easily detached, and if left in the hand or body will fester, and even when extracted cause considerable pain. In places these shrubs were found so thickly growing that, during construction, roads had to be cut through them before man or beast dare venture through. There is much more water coming down the mountains in the Selkirks than in the Rockies, and more along the Illecillewaet than along Beaver Creek.

On the west slope the track passes through one earth or mud tunnel and several of rock, but none of great length; and from Albert Canyon Station to Twin Butte Station it runs along the steep hill side and gradually rises above the river. After passing this latter station the valley soon begins to widen, and the railway runs down to the level of the river. The valley is, in some places, half a mile wide, part of the bottom being marshy, and part low spruce and cedar swamp.

The game in the mountains is nearly all large—the grizzly, the black, and the silverlip bear, the mountain goat and sheep, whose habitat is near the timber line, and the caribou; the last were especially numerous near the Second Crossing of the Columbia. Song birds enliven morn and eve with their melody; but the streams are too rapid to make them a resort for aquatic birds, except on the Columbia. No venomous reptiles were noticed.

Twin Butte (Mounts Mackenzie and Tilley) stands in the angle of the two streams, south of the Illecillewaet and east of the Columbia. For the purpose of observation and taking photographic views, an ascent was made on to the west mountain. Leaving camp at about six o'clock in the morning, we walked up the track to where we could cross the Illecillewaet on a timber jam in the canyon, and as soon as the river was crossed we began to climb the mountain through a brûlé which was overgrown with young evergreens, poplar and alder, so thickly that it was difficult to force a passage. After a time we entered a strip of open green woods, which lay on the opposite side of a mountain stream from the brûlé. The change was very acceptable, for the thick brush was loaded with water from a recent rain-storm, and we were drenched by it at almost every step. In the open bush we found more of

the shrub—Devil's Club—already described, than before. After a stiff climb we reached the top of the shoulder of the mountain, and after crossing a brûlé at the height of 4,000 feet above the track, a pretty little glade was found, with streams running through it, little marshy meadows with small ponds in them, and stretches of rank green grass dotted with flowers. The dark green foliage of the spruce, which were about twelve inches in diameter, gave the place a particularly pleasing aspect. The water in the streams was clear and cold, and flowed between banks lined with bright green grass and moss; it came from the melting snow on the peak above. Numerous tracks and trails of the mountain goat and caribou were seen. Pushing on we soon left the last of the timber behind us, being stunted, small and sparse, and 1,000 feet from the top of the peak. The west cone, above the timber line, is broken shale and clay, with here and there an outcrop of rock. It is covered with short grass to its highest point, and trailing juniper grows in patches. Having gained the summit of Mount Mackenzie, at an altitude of 5,896 feet above the track, the view was grand, although the air was not so clear, on account of smoke, as desired. But a short distance away the east peak, Mount Tilley, rose above us several hundred feet. Between the peaks yawned a ravine, with a glacier, which fed a stream and lake far below. Large masses of snow lay on the east peak, in cube shaped chunks, and helped to feed the lake below. To the south lay the Arrow Lakes; far away in the valley of the Columbia, and looking south-east, over a wide but not very even valley, Mount Cartier was seen to rise high above the surrounding country. West of the Columbia, in the Gold Range, arose Mount Bagby, with its triple peak and many glaciers, and to the north of it stood Mount Macpherson, while the town of Revelstoke lay in the valley between us and Mount Macpherson. The junction of the Illecillewaet with the Columbia was plainly seen, and also the course of the railway, which could be traced, like a huge snake, for some distance into the Gold Range. The thermometer registered 45° Fahrenheit, in the shade (noon of 13th August), and a cold wind was blowing from the south; a few flakes of snow were falling on the peak. The vegetation on these peaks is, where not lately burned, very rank and luxuriant, and the timber far up the slopes is of a size, quality and quantity fit for market. After a stay of three hours on the summit, during which time the desired observations and photographs were taken, we began to retrace our steps as rapidly as could be done with safety. At times the rate of descent would be involuntarily great, and the friendly assistance of tree or shrub to stop the sliding feet or body was gladly taken to prevent going over a cliff or precipice. At eight o'clock in the evening camp was again reached, having walked, altogether, thirteen miles, and climbed 12,000 feet.

Before reaching the valley of the Columbia a second time the Illecillewaet contracts and rushes through a narrow gorge, which in places is only 20 feet wide. Shortly after crossing the latter stream for the last and thirteenth time, the track bends to the north while the river flows southward and empties into the Columbia. Skirting along and winding around the hill and mountain side for a few miles on the way, passing through a small meadow, fragrant from the yellow-flowering musk plant, brings us to the Second Crossing of the Columbia, at Revelstoke, formerly known as Farwell, 1,616 feet above sea level. Here the desired connection is made with the survey from the Pacific coast.

Before closing this part of the report one subject deserves especial attention. It is that of forest fires. Great fires were raging during July, and the air was dense with smoke, at times to suffocation, obliging me to stop work, and a vast amount of timber was destroyed. The principal revenue of the country under consideration will be from its timber, and hence its preservation is of great moment, without considering the beauty it adds to the scenery. The origin of fires may be manifold: lightning, fire-arms, camp-fires, clearing, and locomotives. It has been found from close and personal observation during the past season, that by far the greatest number of fires originated through locomotives, favored by the uncleared right of way, where sparks find material particularly well adapted for the propagation of fire.

MAGNETIC WORK.

Besides the survey proper, magnetic observations were taken for declination, inclination and total force, but the results have not yet, from want of time, been computed.

ASTRONOMIC WORK.

After completion of the above survey, the astronomic work of the preceding year, of which I have charge, was continued.

The determinations of 1885 gave the following results :—

	Longitude.			Latitude.	
	H.	M.	S.		
Victoria	8	13	26.20	123° 21' 33''-00	48° 25' 31''-38
Port Moody.....	8	11	26.47	122° 51' 37''-05	49° 16' 29''-55
Kamloops.....	8	01	21.12	120° 20' 16''-80	50° 40' 39''-66

As the work of the past year has not yet been wholly computed, nor the connection made with some eastern established point as intended, an extended and full review of the determinations and matters associated therewith cannot now be well made, and it is therefore reserved for a future time.

The observatory at Kamloops was found inconveniently far from the telegraph office, and was in consequence removed. Its new position being—

Longitude: 8 h. 01 m 18.36s. or 120° 19' 35".44

Latitude: 50° 40' 39".02

The method of work for the determination of latitude and longitude was the same as pursued and described in the report for the year 1885, and hence will not be again set forth and explained.

Four astronomic stations were established, viz., Revelstoke, Field, Calgary and Winnipeg. The first two are in British Columbia.

At Calgary a triangulation was made to the 5th Initial Meridian, thereby affording a check on its geographical position as determined by the land surveys.

At Winnipeg the lateness of the season prevented making a connection with the triangulation of Mr. Lindsay Russell from the 1st Principal Meridian, and thereby comparing the longitude as fixed by the International Boundary survey at Pembina, Dakota.

Mr. W. Ogilvie, who had been stationed at Kamloops, and I observed for personal equation at Winnipeg on the last days of November. During the last observations the temperature was decidedly low, the thermometer registering 23° below zero.

As before stated, a full discussion of the astronomic work is reserved for a future date.

A copy of the views taken on the survey is herewith transmitted. It may be added that they were all taken at such times as not to interfere with the progress of the survey.

Before closing I wish to acknowledge the courtesies extended by the Canadian Pacific Railway Company for the use of the telegraph line in connection with the determination of longitude.

All of which is respectfully submitted.

I have the honor to be, Sir,

Your obedient servant,

OTTO J. KLOTZ, D.T.S.

E. DEVILLE, Esq.,
Surveyor General,
Ottawa.

No. 6.

REPORT OF WILLIAM OGILVIE, D. L. S.

DETERMINATION OF LATITUDES AND LONGITUDES.

OTTAWA, 28th January, 1887.

SIR,—I have the honor to submit the following report of my operations as a Dominion Land Surveyor for your Department during the past year.

In accordance with instructions issued by the Surveyor General, I left Ottawa on the 16th of July last for Kamloops, British Columbia, where in conjunction with Mr. Klotz, D.T.S., I was to take observations for longitude to establish by the electro-telegraph method the longitudes of various points through the Province of British Columbia and the North-West Territories. I arrived in Kamloops on the 24th July, and immediately set about moving the observatory from where it stood in 1885 to a place more convenient to the Canadian Pacific Railway telegraph offices, than it was when Mr. Drummond was observing in 1885. In setting it up again I located it with reference to the survey of East Kamloops, or that part of Kamloops surveyed during the spring of 1886. With reference to this survey it stands on the intersection of the middle line of Victoria Avenue and Fifth street.

I also connected the observatory with some of the points on my traverse survey of 1885, the data of which I have already communicated to the Surveyor General. In planting the post for the transit to stand on, there being no tripod for it, I dug a hole about five feet deep and about six feet in diameter. In the middle of this the post was set vertically, and carefully packed around with stones the full depth and width of the hole. The observatory was then built around the post. On the top of the post I screwed a heavy sheet iron plate, on which were fixed by heavy screws the three stands for the foot screws of the transit. In this way it was impossible for any cracking of the post to affect the azimuth of the transit by moving only one of the foot screws, as, if any movement took place at all, it would have to be from the movement of the post as a whole.

The azimuth of the transit, therefore, remained steady compared with its variation with Mr. Drummond the year before, when the post was imbedded in the earth and the top had not the binding plate. He says in his report for 1885 that his azimuth was, on the 26th July, 0.46 sec., on 11th August it was 7.25 sec. and on 12th August it was 11.30 sec.; while my azimuths ran as follows: 15th August $a = -0.100$ sec., 16th August $a = -0.236$ sec., 17th August $a = -0.257$ sec., mean of two sets, 18th August $a = +1.032$ sec., mean of two sets, 7th September $a = +0.039$ sec., 10th September $a = -0.519$ sec., mean of two sets, 11th September $a = -0.097$ sec., mean of two sets, 12th September $a = +0.327$ sec.

After this date I changed the azimuth of the transit twice; this was owing to the breaking of the transit wires in the telescope in some unaccountable manner, before we began the Kamloops-Calgary determination. I found it very difficult to secure suitable wires, and the set I put in did not please me as to regularity either of interval or of size; so after the Kamloops-Calgary work was finished, I put in another set for the Kamloops-Winnipeg work which are yet in the transit and though a shade thick are very regular in interval and size. When I obtained the instrument there were only the five vertical and one horizontal wires in it. I put in the five vertical wires, two horizontal wires and one on the micrometer frame, so that the instrument now has all the wires it ever was intended to have.

When I began to observe, I found considerable trouble from wind, not a strong one, but a gentle breeze which would start the telescope vibrating, first a slow undulating motion which would increase in rapidity until any point in the field revolved in an ellipse of which the major axis was vertical and the minor horizontal,

[PART II]

33.

and the latter of such length that I have often seen two distinct passages of an equatorial star over the same wire. But the trouble was much more aggravating in the case of a slow moving star which I have seen pass one wire in an instant and perhaps hang on the next wire for three or four seconds.

I found by experiment that a good deal of this was owing to the telescope not being properly equipoised on its axis, although well enough so to remain steadily in any position in which it was placed, and even during the vibratory motion described it did not change its altitude in the least. By balancing it as nearly as one could, by placing the axis on planes instead of in the V's, I found the wind had very much less effect on it.

The level I had to use was not sensitive enough to show any ellipticity of pivots; but to eliminate as far as possible this source of error, I took the level readings as often as the star intervals would admit, and whenever possible with the telescope at the altitude of the star being observed; and when the altitude was too great to admit the level on the axis, I read it at the greatest possible altitude with the level on the axis.

Unfortunately the chronometer I had was running meantime, which caused a good deal of extra work in the reduction of the observations. The rate of this chronometer during the summer months was very constant, as will be seen by the following table; but when the cold weather commenced in the fall it began to loose on its previous rate.

Rate of Chronometer slow per day on Sidereal time.

	Minutes.	Seconds.
August 4 to 15, slow - - - - -	3	55.99
" 15 to 18 " - - - - -	3	55.30
" 18 to September 7, slow - - - - -	3	55.96
September 7 to 12, " - - - - -	3	55.44
" 12 to October 2, " - - - - -	3	55.86
October 2 to November 10, " - - - - -	3	57.84

It appears from the above that its rate decreased while it was in use, that is, while I was observing and carrying it from the observatory to the station and back again, as is shown in the interval from 15th to 18th August, and again from 7th to 12th September.

The Kamloops-Calgary work was scattered over fourteen or fifteen nights, and the Kamloops-Winnipeg work over twenty or twenty-five, so that we cannot have a test from them, as the nights on which it was used were far apart and the temperature very variable.

While in Winnipeg during the last days of November, with the thermometer every night below zero, once as low as 26° Fah., its rate was approximately 4' 01.8" slow on sidereal time.

During the progress of the work there were many interruptions owing to the telegraph line being down. Nearly all of my register exchanges of time with Mr. Klotz were made while the telegraph office was in the temporary house erected as a freight shed in the summer of 1885, and as everything was in a very rough and crude state, I found it very difficult to make my signals as nicely as I wished.

The following are specimens of transit observation record and reduction of the same, and it will be noticed that the wires are always recorded in the same order, that is, the first wire clamp east is always No. 1, whether the clamp is east or west, and is always entered in column No. 1. Half seconds or beats of the chronometer were counted, and the records made in the same.

TRANSIT OBSERVATION—RECORD. STATION KAMLOOPS, date 7th September.

Star No.	Threads.					Hour and Minute.	Level.		Clamp.	Remarks.
	1.	2.	3.	4.	5.		E.	W.		
302	69.8	94.6	119.0 ?	23.2	47.5	9 49	{ 25.0 23.0 }	{ 23.3 24.5 }	E	
304	118.2	17.0	35.6	54.0	72.4	9 57	.....	.....	E	
512	74.6	95.8	116.0	16.4	36.4	10 04	.....	.....	E	
308	50.0	106.0	42.4	97.5	32.6	10 14	.....	.....	E	
514	9.4	35.0	59.8	84.2	108.8	10 20	{ 23.0 37.6 }	{ 31.0 27.0 }	E	
309	121.0	101.0	81.0	61.8	43.0	10 26	{ 23.0 27.0 }	{ 31.4 28.0 }	W	
517	18.0	109.2	80.2	51.2	23.0	10 30	.....	.....	W	
518	34.0	13.4 ?	112.6 ?	92.2	71.0 ?	10 35	.....	.....	W	
311	34.6	15.6	115.6	95.8	77.0	10 47	.....	.....	W	Cloudy.
521	83.0	21.0	79.6	19.2	79.8	10 54	{ 24.5 27.3 }	{ 30.5 27.7 }	W	

[PART II]

35

TRANSIT OBSERVA

Olamp.	Star.	T		b B	$(\alpha - T_0)_{r_h}$ +9.789	t		α
		h. m. s.	Sec.			h. m. s.	h. m. s.	
E	302	9 49 59.42	—02	—21.36	9 49 38.04	21 01 50.33		
E	304	9 58 17.72	+01	—19.85	9 57 57.88	21 10 10.31		
E	512	10 04 57.92	+06	—18.75	10 04 39.23	21 16 51.72		
E	308	10 15 20.85	+28	—17.07	10 15 04.06	21 27 16.21		
E	514	10 20 29.72	+18	—16.14	10 20 13.76	21 32 26.02		
W	309	10 26 40.75	+15	—15.22	10 26 25.68	21 38 38.14		
W	517	10 30 40.16	+26	—14.56	10 30 25.86	21 42 38.49		
W	518	10 35 56.42	+16	—13.70	10 35 42.88	21 47 55.58		
W	311	10 47 57.80	+08	—11.74	10 47 46.14	21 59 58.63		
W	521	10 55 40.20	+37	—10.49	10 55 30.14	22 07 42.82		

Assumed chron. corr. for chron. time :—12h. 00m. 00s. = 12h. 12m. 12s.

hence the normal equations

$$10ST + 1.61a + 0.24c = 4.58$$

$$1.61ST + 4.56a - 0.58c = +0.86$$

$$0.24ST - 0.58a + 29.71c = +2.75$$

Whence $ST = +0.449$ sec.

$A = +0.039$ sec.

$C = +0.089$ sec.

$\Delta T = +$

h.	m.	sec.
11	12	12.449

Chron. time = 12 00 00.000

True time 23 12 12.449

TIONS—COMPUTATION.

τ	d	A	d A	A ²	O	d O	O ²	A O
h. m. s.								
11 12 12.29	+·29	+·27	+·08	·07	-1·28	-·37	1·64	-·34
11 12 12.43	+·43	+·72	+·31	·52	-1·01	-·43	1·02	-·73
11 12 12.49	+·49	+·55	+·27	·30	-1·06	-·52	1·12	-·58
11 12 12.15	+·15	-1·01	+·15	1·02	-2·92	-·44	8 52	+·295
11 12 12.26	+·26	+·24	+·06	·06	-1·31	-·34	1·71	-·31
11 12 12.46	+·46	+·67	+·31	·45	+1·02	+·47	1·04	+·68
11 12 12.63	+·63	+·05	+·03	·00	+1·51	+·95	2·88	+·07
11 12 12.70	+·70	+·47	+·33	·22	+1·10	+·77	1·21	+·52
11 12 12.49	+·49	+·79	+·39	·62	+1·00	+·49	1·00	+·79
11 12 12.68	+·68	-1·14	+·77	1·30	+3·19	+2·17	10·17	-3·63
	+4·58	+1·61	+·86	+4·56	+0·24	+2·75	+29·71	-0·56
	v	v v						
	-·06	·0036						
	+·04	·0016						
	+·11	·0121						
	-·00	·0000						
	-·08	·0064						
	-·05	·0025						
	+·05	·0025						
	-·14	·0149						
	-·08	·0064						
	-·02	·0004						
		·0504						

$E = \pm 0.056 \text{ sec.}$
 $E_o = \pm 0.018 \text{ sec.}$

As my work was confined altogether to the observatory I did not have much opportunity to see the country around Kamloops, but I made many inquiries about it. For agricultural purposes only a small portion of the surrounding country can be used, as the rain fall is not sufficient for the necessary vegetation; consequently, it is only where water can be found to irrigate that farming can be done, and when water can be put on in sufficient quantities an abundant crop may be looked for with confidence. The long, mild summer is favorable to fruit growing, and no doubt that will be a leading product in the near future, now that the fatigue, danger and weariness of days, I might say weeks, in reaching the locality has been converted by the Canadian Pacific Railway into a pleasure trip of a few hours. During my stay in Kamloops I saw many very large apples, the produce of the surrounding orchards, numbers of which weighed upwards of a pound each. I cannot say that the flavor or pulp was good or even fair, but I have no doubt that a little enterprise and competition infused into the country by the railroad will induce fruit growing on a larger and much improved scale. Heretofore the people have not had a very favorable opportunity to better the condition of their orchards by importation. Now, however, that their isolation is removed by the railroad, the fruit growers who import the latest and best varieties of fruits and adopt the most improved method of growing them will, I have no doubt, realize handsomely on their venture.

The plains of the North-West Territories, where little or no fruit is yet grown, will always furnish a large market for the surplus.

The principal industry of the country around Kamloops will always be cattle and horse raising, for which the bunch grass which grows on the hill sides and in the valleys, where little else grows, furnishes good food. During my stay in Kamloops, in the months of August, September and October, about 3,000 head of cattle were exported, most of them to stock the cattle ranges east of the Rocky Mountains. I saw most of those cattle while being shipped on the C. P. R., and found them in good condition, notwithstanding that the past two seasons have been unusually dry, especially the last, and the grass correspondingly thin and poor. Many head were shipped from other points along the railroad. I also saw many herds of horses, all in very good condition. Most of them were a very fair size, 15 hands high and upwards, and ought to make very fair general purpose beasts. Many of them showed by their build and speed that they came of no scrub stock.

In the timbered districts around Lake Shuswap, the flats and slopes can be used as farms without irrigation, but for many years to come the timber on it will form the raw material for the principal industry of that part of the country, *i.e.*, lumber, for which a ready market will be found east of the Rocky Mountains. In the Eagle River Valley and around Shuswap Lake last summer a good deal of valuable timber was burned—forest fires being very numerous. Strong measures should at once be taken to prevent a repetition of those fires, or what is now the only economical product of a great part of the country will soon be swept away, and it will take generations to replace much of the magnificently large timber that is now standing. But, doubtless, the Crown Timber Agents will keep you much better informed on the dangers to and requirements of this industry than I can.

Already several railroads tapping the Canadian Pacific Railway are projected and being surveyed, notably one starting from Sicamous, and running through the Spallamacheen and O'Kanogan districts; this line is now being surveyed. It is said by all who know the country that this line will tap the largest area of good agricultural land in the Province, and which will be rich also in timber and minerals.

The North Thompson River country will, when fully developed, make many fine farms, and produce some fair timber, with probably some minerals. This stream can be ascended by steamboats about sixty miles, and the locomotive may yet make its valleys echo.

The Canadian Pacific Railway, west of Calgary, affords facilities to the tourist of beholding along nearly 500 miles of its line sights that a Canadian may be proud to boast of, as equalling the grandest and most inspiring scenery in the world. Coming from the east the tourist will find Calgary prettily situated at the entrance to the

Rockies, and here he may gather some ideal impressions of the majestic scenery beyond, in the gradual change from the level prairie behind to hills and valleys, and in the clear, cool running streams, fed by the mountain snows, rippling over gravelly beds and wending their way through fruitful valleys in which nature has strewn with a lavish hand subsistence for thousands of cattle. At Morleyville this merges into a chain of bold and rugged peaks which rear their snow-capped tops above the clouds, and through the Rocky Mountains into scenery which becomes grander and wilder, with huge towering rocks, gloomy canyons and falls of crystal water tumbling down the mountain sides. This is repeated on perhaps a grander scale as the traveller crosses the Selkirk Range to the Columbia, where skill of the highest order is displayed to carry the road from crag to crag.

Through the Eagle Pass and around Shuswap Lake the traveller will see the hills clad with giant timber and dense jungles, and at their base beautiful lakes which mirror the great hills around them, and from the lake down the Thompson River Valley, an open park-like country with farms in every watered valley.

Down the Fraser River from Lytton to Hope are rent rocks, hanging cliffs, tunnel-pierced hills and gloomy passes where the road had to be cut out or suspended over yawning chasms amidst innumerable difficulties, while from Hope to the Pacific Ocean the flats and slopes have some of the largest trees on the Continent, and are backed by mountains whose tops are buried in the clouds.

I have the honor to be, Sir,

Your obedient servant,

WILLIAM OGILVIE, *D.L.S.*

E. DEVILLE, Esq.,
Surveyor General,
Ottawa.

[PART II]

No. 7.

REPORT OF J. J. McARTHUR, D.L.S.

TOPOGRAPHICAL SURVEY IN THE ROCKY MOUNTAINS.

AYLMER, 3rd January, 1887.

E. DEVILLE, Esq.,
Surveyor General.

SIR,—I have the honor to submit the report of my topographical survey along the line of the Canadian Pacific Railway, through the Rocky, Selkirk and Gold Ranges of Mountains.

As instructed by you before leaving Ottawa, I called on Dr. Dawson of the Geological Survey, who pointed out to me on his geological map many places along the railway line which were in blank, and which, as understood between you and him, I would be required to fill in.

I left Ottawa on the 3rd of May and began work at Canmore on the 13th. I used Mr. Fawcett's work as a base for my operations as far as the summit of the Rockies. The first ascents were attended with considerable labor and discomfort, not to speak of danger, as there was still a great quantity of snow in the mountains, and snow slides were of frequent occurrence. The continual low temperature, strong winds and flurries of snow rendered sketching and reading an instrument rather difficult work at times.

The view on entering the mountains is very fine, but becomes more extended and grand as one ascends the slopes towards the summits. The first ascent was up the mountain on the north side of the valley and directly behind Canmore Station. The Bow River flows at the base of this mountain in a valley from one to two miles wide, and on the opposite side appear the Rundle Mountains, which are snow-capped and very perpendicular. To the south there are three strongly defined peaks called the Three Sisters, and up the valley, about a dozen of miles or so, stands the Cascade Mountain. On this mountain I located one of my stations, and from here is to be had one of the finest and most extensive views in the Rocky Mountains, embracing the Bow River and the Cascade, Spray and Simpson Passes.

Looking towards the east, glimpses of the prairie may be seen, and in the foreground lies Devil's Head Lake. This lake is surrounded by mountains from 3,000 to 4,000 feet high and is fed by numerous small streams which flow down the mountain sides; its water is cool, and so clear that the swarms of fish with which it abounds may be seen many feet below the surface. The lake is included in the National Park reservation, and will, no doubt, form one of its principal attractions.

Between Castle Mountain Station and the Slate Mountains I was not required to do any work and therefore moved to Laggan where I was instructed to fill in the topography of the country to the north of the railway. Owing to the character of the mountains on the south side of the valley and the great quantity of snow still resting on the rocky slopes, I was compelled to establish my stations on the Slate Mountains to the north. South from these stations there are numbers of large mountains having glaciers, and to the north-west Mount Hector stands out prominently alongside the pass to the North Saskatchewan.

Our next move was to Hector Station across the summit of the Rockies which separates the waters of the streams flowing eastward from those which flow westward. West of this summit I used the astronomical traverse of Mr. Klotz as a base for my operations. We made the ascent of the mountain to the north across Wapta Lake, and passed a place where a heavy strip of timber about 20 chains wide and fully a mile in length had been broken down by a snow slide some years ago. The view

[PART II]

from this mountain presents five small lakes, one of which at the time of our exploration was still covered with ice, and all, more or less, were surrounded by dense forests. The inlet to Wapta Lake is a beautiful creek which comes from the south and dashes along with many breaks, while the outlet is the turbulent Wapta River. Within a mile or so of Field, this river expands to nearly a quarter of a mile in width, and a mile and a-half farther down enters a canyon where there are abundant facilities for converting the valley into a lake.

I located one of my stations on the mountain immediately opposite Field, and from this point a magnificent and extensive view may be had. To the north-west is the Howse Pass, to the south-west, in close proximity, are Mounts Russell and Carmanan, the two prominent peaks of the Van Horne Range, while to the south-east are the lofty outlines of the Cathedral Mountain and Mount Stephen. The Canadian Pacific Railway trains run through a tunnel at the base of the last named mountain, and immediately above is a rich galena lead which is yet undeveloped. A few miles to the north is a beautiful lake surrounded by the mountains and fed from the melting glaciers and snows. Mountain goats are numerous in this neighborhood.

At Ottertail, eight miles from Field, the Ottertail Mining and Lumbering Company are carrying on operations; they have erected a sawmill and are expending considerable sums in prospecting.

Our next station was Palliser. Here we found large numbers of goats. Proceeding along the Wapta, a few miles before reaching the valley of the Columbia, the canyon and river scenery offers an inexhaustible field for the photographer. From Golden City the valley of the Columbia contains some fair agricultural land and several squatters have already taken up and improved claims.

From Moberly Peak a fine view is to be had of the valley of the Columbia River and the Howse Pass; this mountain is the most conspicuous in the vicinity. Between Blueberry Creek and Donald, the mountain slopes on both sides of the valley are heavily timbered. Donald is the terminus of the railway division, is well situated, and may become a thriving place.

From Donald to the mouth of the Beaver, the mountains on the south side are some miles from the river, and the foot-hills are densely wooded, but were greatly over run by fires last summer. On the north side a high wooded ridge extends between Bluewater Creek and the Columbia River which below this point is very rapid and dangerous. The valley of the Beaver River, as far as the Forks, has been denuded of its large trees for the purposes of railway construction and snow sheds. Mountain Creek is fed by the snows of the Selkirks and enters the Beaver about nine miles from its mouth.

We made the ascent of Tupper Mountain, and on this occasion passed over a glacier which was about one square mile in extent. This field of ice, which lies to the north, may be seen from Roger's Pass. Immediately to the south is Mount Macdonald, which rises almost perpendicularly from the valley below.

Roger's Pass or Summit. Here we established a station on the mountain on the west side of the Pass. There is no scenery along the line of the Canadian Pacific Railway across British Columbia to compare with this section of the Selkirks, and it is impossible to describe the magnificent panorama which unfolded itself to our view as we made the ascent, and as mountain after mountain came in sight. It is practicable, and it would be advantageous if tourist trails were made to the summits of a number of the mountains in this neighborhood.

Three miles from Roger's Pass the Canadian Pacific Railway Company have erected the Glacier Hotel, from which a fine view may be had of two immense glaciers and of Mount Donald, the summit of which towers above the rest of the chain, and is from time to time obscured by passing clouds.

It is a matter of regret that fires incidental to railway construction have devastated much of the country in the vicinity of the railway and have spoiled much of the wonderful beauty of the environs of these mountains. The greater part of the valley of the Illecillewaet has been burnt over, and in most instances these fires have occurred through wanton carelessness. Apart from climatic and other considerations,

the large quantities of timber in the tributary passes which have so far escaped destruction, should impress upon the Government the necessity of using every means in its power to suppress this species of vandalism.

The Kerr Mine is situated on the north side of the valley, about three miles distant, east, from Illecillewaet Station. According to the assays, this is an exceptionally rich galena lead. About six miles from Illecillewaet is the Albert Canyon, from which the next station takes its name; and one-third of a mile beyond this station is a remarkable spring impregnated with soda, magnesia and iron. Caribou and goats abound in the mountains here.

We made the ascent of Mount McKenzie, one of the twin peaks which stand at the mouth of the Illecillewaet Pass. The slope of the mountain is densely wooded until about one thousand feet from the summit, where there is a sort of bench covered with a spruce forest having small prairie openings or glades every hundred yards or so, which are intersected by small clear streams. There is no under-brush whatever, and the ground is covered with grasses and moss, yet we are five thousand feet above the valley. All the mountains which we ascended on the east side of the Columbia possessed the same characteristics and these beautiful forest glades. Almost beyond the reach of man are the summer haunts of the caribou and bear.

From the summit of Mount McKenzie there is a very extended view up and down the valley—twenty miles in either direction. Directly across the valley is Mount Begbie, the most prominent peak in the neighborhood. Down the river is the snow-streaked outline of Mount Cartier, and beyond it Arrow Lake, and alongside of us, on the east, is our station's twin sister, Mount Tilley.

I ascended the Columbia about twenty miles and found, on the east side, all the mountain slopes to be well wooded. The Provincial Government have opened out a pack trail as far as the Big Bend. I located a station about ten miles north from Revelstoke, but smoke interfered with my work greatly. The river is rapid and there are but few islands. I also established a station on a mountain on the east side of the valley, about fifteen miles down stream from Revelstoke, but here also smoke prevented me from doing much work. The river is rapid and is divided by islands and sandbars into many channels. There is very little, if any, arable land in this part of the valley.

From Revelstoke to Sicamouse Narrows, where I turned back on account of the smoke, my progress was slow and unsatisfactory; however, I established two stations on the mountain near Griffin Lake, and succeeded in obtaining the topography of this immediate neighborhood. Three Valley Lake is situated at the mouth of the South Pass, and is connected by a creek with Griffin Lake. The timber line reaches almost to the summit of the mountains, and at this altitude vegetation is still profuse; the ridges are covered with grass and here and there are lakelets and groves. The mountains along here are much frequented by caribou and the lakes abound with fish.

From Griffin Lake I moved to Craigellachie and from thence to Sicamouse Narrows, but at neither point was it possible to do any work on account of the smoke, and, after remaining nearly two weeks at the latter place, I received instructions from you to proceed to Banff to assist in the survey of the National Park.

I have the honor to be, Sir,

Your obedient servant,

J. J. McARTHUR, D.L.S.

No. 8.

REPORT OF FRED. W. WILKINS, D.T.S.

EXPLORATORY SURVEY OF LAKE WINNIPEG.

SIR,—In accordance with instructions received and dated 14th May, 1886, in the above connection, I proceeded at once to Winnipeg, stopping on my way at Rat Portage, to send forward the canoes and outfit used by Mr. Fawcett last season and now assigned to me. Having organized my party and purchased supplies, on the 3rd of June I went by rail to Selkirk to which place I had expressed the canoes, but these, to my disappointment did not arrive until two days later, owing, as I was informed, to a delay in procuring a long enough car on which to transport them.

Upon their arrival I found that they required quite extensive repairs, and that too by a skilled hand, whom I at once procured and set to work, a week being the shortest time in which he would undertake to complete the job. This he did so satisfactorily that no further repairs were required during the entire season.

During the delay I was advised by experienced parties to ship the great bulk of my supplies to convenient places around the lake and to keep my canoes light if I had much landing to do. This I did and it turned out a fortunate thing for us, as almost every time we needed to go ashore the extreme shallowness rendered wading necessary for long distances before we were able to effect a landing, and our whole course was one continual fight with wind and rough water. The canoe covers sent, although rather small and troublesome to fit on, were indispensable, as without them our low-sided canoes could not have been taken on the lake at all. On the 14th my canoes were delivered to me in good working order, and on the 16th the actual work of the survey commenced.

The following general description marks our course, which was along the east and back by the west side of the lake to the starting point.

Starting from Selkirk, for about ten miles down the Red River, a most excellent country was passed, all thickly inhabited by the half breeds of St. Peter's Parish. The remainder of the course to the lake, about twelve miles, is bounded by marsh, but the immediate bank of the river being much higher than the marsh furnishes a good camping ground almost anywhere along. From the easterly one of the mouths of the Red River we turned along the south shore of the lake to the east, and for about nine miles we skirted along the marsh just spoken of before reaching high land.

We now turned almost due north, and from this point until near the mouth of the Winnipeg River in Traverse Bay, the lake shore has an altitude of from ten to thirty feet or more, and apparently rises higher at the back. As far as Point des Grand Marais the soil appears to be good, and the trees consist of poplar, birch and spruce, of fair size. A number of settlers, mostly half-breeds, are located along here. Farther on, in places, there is tamarac swamp, and the soil all along is evidently a very light sandy one; the timber, in some places, being composed of Banksian pine and spruce, and at others of small poplar and birch. A few miles before the mouth of the Winnipeg was reached the country suddenly falls, becomes, in general, very swampy, and so remains to the west limit of the Indian Reserve at the mouth of the river. The shore now attains the height of about eight feet which increases as we cross the mouth of the river to about twenty feet. The soil along here is a most excellent clay loam and the timber growing on it is very fine poplar with some white ash and grey elm.

The Winnipeg is a very fine stream and is the second river, in the volume of its contribution, entering the lake. The Indians on the reserve (Ka-ke-pe-nais) here

appear to be very comfortable, to have good houses and to cultivate considerable land. I was told that all kinds of crops do quite as well here as in any part of the Province. About a mile up the river is situated the Hudson Bay Company's post, Fort Alexander, and the Roman Catholic Mission, and farther up, the Episcopal Mission. At the mouth of the river on the north side the first rock was seen in the occurrence of beds of gneiss at water level, and from this on, until we reached the head of the Nelson River, the outlet of the lake, similar rock of the Laurentian age constantly appeared.

Shortly after leaving the Winnipeg the shore again falls and becomes swampy, with small timber as far as Point Metassé. Shortly after passing this point, which is composed of a small island-like ridge of clay holding boulders resting in a very level gneiss, the rock, which until now has only just been at water level, rises to a maximum of about twelve feet, and in consequence, a rougher and bolder shore is now met with. Quite a thick covering of good soil was however seen frequently on this rock as we proceeded, and from the appearance of the timber, which was often of a nice size, I would judge that some excellent land might be found here.

At Black River, a small insignificant stream, the country again drops, the rock again just appears at intervals at water level, and the shore is bounded by about one-half to three-fourths of a mile of muskeg, which in its turn is bordered by spruce and tamarac swamp. Occasionally small patches of poplar are seen, but to no great extent. This holds to the vicinity of Sand River, where, from the fact that more soil remains on the top of the rock, which is still at water level, there is a higher shore and some tracts of undoubtedly good land. The timber along here is much better than along the former stages of our course, some of the poplar being of fine size. As we proceeded northerly the country still improves, the shore becomes higher and there is less swamp.

Passing Bad Throat River, another small stream, the better tract of country still continues, with a rising shore—the height in places attaining twenty to thirty feet—until the Hole River was reached. The Hole River is a small stream, and is so called because it enters the lake through a small opening in the rough rocks which here form the shore.

At this river, as well as at Black River some distance back, a small band of Indians is located, but I could not learn that they had attempted to grow anything. At the Bad Throat River, however, some white people located there had been very successful with garden stuff, among other things growing and ripening tomatoes, so that I am perfectly satisfied that all kinds of grain will do as well here as farther to the south. At the Hole River it appeared to us that we had come to a dividing line in the country, and nowhere, farther down the east shore, does the country again present as good an appearance.

For some miles beyond the Hole River the shore is very rugged and uneven, with a maximum height of about twenty-five feet; there is a little soil and less good timber, what there is being Banksian pine and spruce, both scrubby.

We now passed, near the mouth of the Wild Rice River, an unimportant stream, thousands and thousands of islands, in size from a square yard to an acre or two, huddled together with very shallow water between them, and bounded by a very marshy main shore. Here we had great difficulty in keeping to the main shore, and often we were obliged to have stations on the islands, it being impossible to get to the real shore, so shallow was the water. These islands, or more properly speaking, islets, were composed entirely of low gneissoid rock, with no soil worth mentioning, and having only bushes and small trees growing on them. The marshy tract along the shore seemed to reach in about a mile, when the land, apparently, rose a trifle. Considerable poplar timber could be seen some distance back, so that it is possible that even here some good land exists.

Emerging from the islands, which have extended for about ten miles, we still found a rocky shore, the rock being only just out of the water, and bordered by half a mile or more of muskeg; in places poplar was seen, which seemed to indicate better land. Here and there along the shore small clumps of poplar and spruce were

seen. This kind of country continues along to Loon Creek, after which are rough rugged rocks, with little or no soil on them, on which grow only scrub Banksian pine and spruce. It again rises, in places perhaps 15 feet in height, but in general not half so much.

At the inner ends of a few coves a little soil and some fair-sized poplar timber was noticed.

When about opposite the Bull's Head we again came to islands, with much the same characteristics as the others passed, only somewhat higher. These islands continued until we turned round the corner at the Old Dog's Head towards the Vein River. The shore again becomes marshy, with its usual border of muskeg with swamp at back, and so continues until the vicinity of the Pigeon River is reached, with little change. The Vein River, just passed, seemed to be a nice little stream, but the bay is so full of rocks and shoals that large boats will never be able to get in here. The Indians located here lived up the stream some little distance, so that I did not see anything of them. I believe, however, that they grow potatoes, so that there must be some land, but they do not grow anything else. At the Pigeon River as well as at Beren's River the rocks rise higher again, which seems to be the rule at all river mouths, and some soil again appears, with considerable poplar timber. I should judge that quite a bit of land exists at the mouths, and perhaps up the streams as well, of these two rivers. Both these streams are nice ones, though I am told that rapids are numerous a short distance up. At Beren's River is another Indian reserve and also a Hudson Bay Company post and two mission stations, the Roman Catholic and the Methodist. A large band of Indians are located here, who possess an unlimited number of dogs. These latter in the daytime make things lively for themselves by continual fighting, and when daylight is gone render the night hideous by their dreadful howling.

Here, although the soil is a strong grey clay and not nearly so good as farther to the south, all garden stuff, oats and barley do remarkably well. I was told that wheat had been tried as an experiment merely and had done well.

North of Beren's River to the vicinity of Poplar River, the old story of swamp and muskeg is repeated. In the bay around Flat Head Point, not far from Beren's River, a bed of peat was noticed, and in this locality it was almost impossible to get ashore, so soft and boggy was it. In the vicinity of Poplar River the rock again rises a little, with some soil, and to all appearances some land exists here. At the Hudson Bay Company post here good vegetables, oats and barley are grown, but wheat has never been tried. The river seemed to be quite a nice stream, but I was informed was full of rapids a short way up. There is a good deal of nice poplar timber in the vicinity, which circumstance, I would suppose, gave rise to the name of the river.

Shortly after leaving the river we entered among small, low and barren islands, with a very marshy main shore, which, as before, we had great difficulty in reaching. These islands continue, more or less, all the way to Black River, where they become less numerous; the rocky shore becomes higher, some soil again appears, and there are groves of fine poplar mixed with spruce timber. The Black River is a nice small stream and, as is the case with all these small streams, contains water of a dark color.

On leaving the Black River we soon came to the usual muskeg, from half a mile to a mile in breadth, with the usual backing of spruce swamp. With little change this condition of things remained until we passed the Little Black River, a small, slow stream about four miles on, when the shore becomes higher and the muskeg disappears.

At Montreal Point the bank along the shore appears to be about 15 feet in height, and to be composed of grey clay holding boulders. The rock however does not change, and is still a gneiss of a hard description, and only just slightly elevated above water level. On the top of the bank there is spruce and tamarac swamp all along, with occasional clumps of nice poplar and birch on the extreme edge of the bank. This swamp on top has been a good deal burnt in places, and the timber,

where green, is small and of no account. Except that the bank falls to about 6 feet in elevation, there is no change along to the Nelson River opposite Warren's Landing.

This river, which is a magnificent stream of great depth and strong current, is divided, just at its head, into two channels by an island, the westerly channel, used by the steamboats, being about three-fourths of a mile in width, while the easterly is about half that distance. It is the outlet of Lake Winnipeg, draining perhaps 400,000 square miles of territory, is one of the grandest streams I have ever seen, and is entirely in keeping with the immense country from which its supply is drawn. Warren's Landing is upon the west side of the river, and just here the shore is low and sandy.

At a short distance below the Landing we noticed, for the last time in our journey, Laurentian rock, a characteristic showing up of gneiss, at about water level, occurring here. Farther to the west the shore begins to rise, and at Mossy Point attains an elevation of about 60 feet, about 50 feet of which is yellowish clay holding boulders and covered by about 10 feet of peat. The cliff thus formed is as steep as the material of which it is composed will admit. On the top of this bank is a mossy tamarac swamp with small timber and, in places, a good deal burnt over.

This steep bank of clay occurs almost all the way across the north end of the lake, when, just before we reached the inner end of Limestone Bay, it had dwindled down to nothing, and had merged into the almost universal muskeg. At places along the high bank just referred to, where old fires had cleared the peat off, I noticed that poplar and other high land timber had commenced to spring up, and from this circumstance I would suppose, that if the peat were cleared off the surface of the clay, a good soil might perhaps be obtained. At Norway House, a few miles farther north, garden stuff, oats and barley do well, and if soil, which is exceedingly scarce at Norway, could be obtained, why not here as well?

The long point, shown on the maps and called Limestone Point, is certainly misnamed, being composed wholly of sand and being nothing less than a long and very narrow sand-bar, from six to twenty chains in width, upon which, in the course of time, has grown a belt of spruce timber. This spruce is in general of good size, and a considerable quantity of the stuff could be obtained here.

Continuing our course, the remainder of the north end of the lake is at first low spruce and tamarac swamp, then muskeg backed by the same; and this description is equally applicable to the west side of the lake, along to the mouth of the Saskatchewan River, with this variation that, going southwards, the muskeg along the shore is replaced by low wet tamarac and spruce swamp, the timber of which is small and of little use.

In general, the shore along this portion of the lake is very muddy and soft, the only exception to this being in the vicinity of the William River, where a few points of limestone rock occasionally occur just above water level. Farther to the south, however, there are island-like cliffs of limestone rock, apparently of the Trenton age, rising to the height in one case of about sixty feet, and invariably backed by the usual swamp. Distant to the west some miles from the lake shore a higher range of country can be seen, no doubt connected with the high country down which the Saskatchewan pitches to form the Grand Rapids; and there can be little doubt but that these high limestone cliffs just spoken of are outlines of the same.

In all the last stretch of country neither any good land nor valuable timber was seen, though both might occur a few miles inland. A little good land, though at a low elevation, is again seen at the mouth of the Saskatchewan River, which is here less than 25 chains wide, though apparently very deep and having a strong current. Southerly from this for a short distance the land is again low and swampy, and then for some miles it rises, showing in places along the shore a yellowish colored clay bank from 6 to 12 feet in height. The shore along here is covered with huge boulder stones, evidently washed out of the clay bank just mentioned. The timber seen is, in general, small, though a few small clumps of poplar and spruce of fair size were noticed. From appearances I should say that some good land exists in this locality.

From this, and following out the whole length of Long Point, little else but low swampy land was seen. The timber, except in a few small clumps in which grow some nice poplar and spruce, was in general very small and of no value. Along the south side of Long Point, a yellowish clay bank of from 10 to 20 feet in height occurs, having from 2 to 3 feet of peat on the top, and occupied wholly by mossy tamarac and spruce swamp, the timber in which, as is always the case in mossy swamps, is very small.

South from Long Point the land drops to almost the lake level, and again there is half a mile of muskeg backed by tamarac and spruce swamp, and seemingly this swamp reaches a considerable distance inland. The timber near the lake is of small size and of no value.

At one place there was noticed, about two miles inland, a cliff about 70 feet in height, and evidently of limestone rock, the swamp bordering the shore evidently reaching to the foot of the rock.

With little change the same kind of country occurs as far as Warpath River. A good deal of poplar was noticed, apparently becoming more plentiful farther inland. As we proceeded southerly the country rises a little, the limestone rock, in places, forming cliffs up to 15 feet in height, is more frequently seen, and although the surface is still swampy enough, very little muskeg was noticed, and this appearance continues the same to the Little Saskatchewan River in Sturgeon Bay. All along the section just referred to a good deal of fine poplar and spruce was noticed, and, although very little of it was of a size suitable for saw-logs, a good many spruce ties might be obtained.

For a few miles before reaching the Little Saskatchewan, along the west side of Sturgeon Bay, some good land is seen, though at a low elevation, and growing on it the finest timber—poplar, spruce and birch—we have yet seen. The Little Saskatchewan River is about five chains in width at its mouth, is apparently very deep, and at the time I was there the current was very slow.

Almost immediately after leaving the Little Saskatchewan the shore becomes very low, and once more we met with muskeg, the usual half mile or more backed by spruce and tamarac swamp, and this continues until we are well around the bay, when the country gradually rising, some patches of good land with nice spruce and poplar timber appear along the shore. Farther inland, however, the poplar timber seems to become more general, so that the probability is that some nice tracts of good land exist about here. As we leave Sturgeon Bay the underlying rock, which is Trenton limestone, comes up more prominently, and after we passed Lynx Bay, rises into cliffs, reaching an altitude of some 15 to 80 feet. Apparently no great depth of soil occurs along here, although there is a good deal of nice poplar and spruce timber all along. Turning Cat Point into Kinnow Bay, the country again falls, although for some miles it still holds a good elevation, and although there is rather fine timber, burnt a good deal in places, the soil appears to be but a thin coating upon the overlying rock.

Again we passed low swampy land for some miles with small timber, backed, however, by higher land, a good deal of poplar being visible a mile or so from the shore, and again before reaching the inner end of the bay there is a considerable stretch of good land with a general elevation of about 8 feet above the lake and having growing on it some very nice poplar and spruce. As we turned to come out of the bay the shore is again low and swampy and so continues for a considerable distance. Back about three-fourths of a mile from the shore, however, fine poplar and birch with some spruce timber occurs, thus indicating good land. Farther on, the high land comes down to the shore in places and again patches of muskeg show up. Behind the muskeg poplar and birch are generally to be seen.

As we turned out of the bay a swampy and marshy shore is general, evidently backed by higher land, poplar and birch being seen all along until we approached the Jackfish River. There is now some excellent land with a reasonable elevation, the surface in this locality being, I should judge, about equally divided between swamp and high land. There is some fine poplar and spruce along here, but for some distance farther south has been badly killed by fire.

As we proceeded southerly a very similar country to the last described occurs without much change well down into Fisher Bay. The country now changes somewhat for the better and far less swamp was encountered, there being considerable stretches of good land having an elevation above the lake of about 8 feet, the soil of which is an excellent clay loam and the timber, poplar, spruce and birch, being of fair size, and of a thrifty appearance.

About five miles from the inner end of the bay there is a small saw-mill, and judging from appearances, it seems to cut considerable lumber. The size of the logs on the skidways seemed to be about 14 inches in diameter on an average. The whole of the inner end of Fisher Bay is marsh a mile or more in depth, and through this marsh flows the Fisher River, a small stream, having very little current. Large tracts of this marsh produce hay of very good quality, and the Indians of Fisher River get their winter's supply of hay here. I was told that excellent vegetables, oats and barley were grown here, and have no doubt but that wheat would do well also if tried. The east side of the bay is, in general, of a low character, having island-like ridges and points, showing a clay bank in places 12 feet in height. A little flat limestone rock was also noticed at some of the points. The poplar, birch and spruce were not very large and nothing to compare with those on the west side of the bay. In the swamps the river was, as usual, small.

Five miles from the Dog's Head, at Ebb and Flow Lake, there is another saw-mill, which is quite an extensive one, and is the property of the North-West Trading Company. The logs cut here are obtained up the Ebb and Flow Lake, and are of a similar size to those described at the last mill.

Shortly before reaching the Dog's Head, the limestone rock comes up more prominently, and at the head forms a cliff about 25 feet high. There is a thin covering of soil in places, and the timber, spruce, poplar, birch and balsam, is small. From this to the Bull's Head, there is, as a rule, the highest shore around the lake. At all points and along the more prominent shore there is a high cliff, as much as 70 feet in places, but here and there badly broken down, as the lower beds of rock being soft, have been easily torn away by the action of the waves, causing the upper and harder rock to fall. In many places these fallen rocks have broken off in large pieces, and have evidently come down gradually, as they stand at an angle to the cliff from which they fell. At the backs of the bays the elevation is always much less, and in some places descends to wet tamarac and spruce swamp. In all the bays more or less good land occurs, and in places some fine tracts, on which there is mixed spruce and poplar of good size. Along the very high shore the timber is mostly spruce, and judging from the size of the logs cut and piled along the bank, there must have formerly been a very good average of timber, though not much of any value is now left. A considerable quantity of land suitable for farming purposes exists in this locality, the soil of which is generally an excellent clay loam.

At the Bull's Head I saw samples of potatoes and other garden stuff grown there, and without doubt they were as fine as any I have seen grown in the country. I am also perfectly satisfied that grain, as well as other things, will do as well here as on any portion of the prairie country to the west.

A few miles beyond the Bull's Head the country again drops to a general level of about 8 feet above the lake, with the limestone rock showing out all along in a low cliff. There is generally a fair coating of soil, and the spruce, poplar and birch is of a fair size. The appearance of the shore would indicate good land to the rear, but on going back a short distance, as it appeared to be growing swampy, I am in doubt as to this. Some miles before reaching the inner end of Humbug Bay the rock dips, and again we have a shore of low altitude. There is a good deal of swampy land intersected by some very good high land, and from the appearance of the timber the surface rises considerably inland. The timber, though of fair size in the high land, is a good deal burnt about here, while that in the swamp is usually of small size. For about 17 miles around the inner end of this bay there is a marshy tract about a mile in width, and to the rear of it appeared to be tamarac swamp, with some poplar in places. The Washow River, a small insignificant stream, here enters

the bay. We were obliged to wade every yard of this marsh and the shallow water bordering it, which caused us more aches and pains than the rest of the survey put together. After passing it, however, we came to a low shore with flat limestone rock frequently showing up, bordered by swamp and muskeg, which, in its turn, seemed to be bordered by higher land to the back. Here and there along the shore some higher spots of small extent were seen, having good soil and a little fine poplar and spruce timber growing on them. When about half way out of the bay the rock again rises, and a cliff ranging from 10 to 20 feet in height is a frequent occurrence. There is also some swampy land at the inner ends of some of the bays, but, in general, the land is high and dry, with poplar, spruce and birch timber of a small average size.

At the Grindstone Point the cliff attains a height of about 70 feet, and appears to consist of about 12 feet of limestone rock resting unconformably on soft sandstone, with bands of ironstone at the bottom, and just at the water's edge is a greenish colored compact sandstone rock, the grindstone, from which the name of the point is derived.

Going south from Grindstone Point the cliff gradually decreases in altitude, until, at a short distance south of the Little Grindstone Point, the rock finally disappears altogether. In many places along, in fact most of the way for that matter, the debris caused by the breaking down of the cliff almost hides the rock from sight, and from the general character of this debris I am satisfied that good land exists at the top of this high bank. The timber, poplar and birch, which is growing along here is rather small, but I am satisfied that it will be found to improve a little way back. Farther south the general altitude of the shore is about 8 feet above the lake, and there is most excellent land, with swamps in places. The timber, poplar, birch and some spruce, is not of a large size, but improves farther back.

About twelve miles south of the Little Grindstone Point we again came to marsh, which extends to the sandy bar, a distance of about twelve miles south, and appears to be about a mile in depth. There is at the back of the marsh a good deal of poplar mixed with spruce timber.

At the mouth of the Icelanders River, a small, though to all appearances a deep stream, which joins the lake about one-third way down the marsh, there is a large tract of hay marsh, producing excellent hay, from which the Icelanders cut large quantities for winter's use. This marsh almost connects Big Island with the mainland, the disconnection consisting of two quite narrow passages called the Grassy Narrows, about one-half mile in length, the water in them being only sufficient to float York boats. From the sandy bar south to the marsh, at the upper end of the lake, the general height of the shore is from 8 to 10 feet, though in a few places it is somewhat higher. The country along is evidently an excellent one, with only a small proportion of swampy land and generally an exceedingly good soil and very good sized timber, principally poplar and birch, with some spruce.

We now again reached the marsh, through which the Red River finds its way to the lake, and skirting the same for a few miles we entered the easterly mouth of the Red River from which we started. Thus we have made a complete circuit of this large body of water, about 270 miles in length, by a width ranging from 2 to 60 miles, and this too without having one dangerous accident occur, despite its reputation for roughness and windiness, which to say the least is well deserved.

The canoes, too, came through the season's use but little the worse, thanks, in a great measure, to the thoroughness of the repairs done to them before starting out, and only that they were cut a little about the bows by the ice through which we were obliged to break our way for several miles going up the Red River, would have been returned almost as good as when we first put them in the water.

In conclusion, it may be said of Lake Winnipeg, that it is large, shallow, rough and stormy, and that in view of these facts must ever be a difficult and dangerous body of water to navigate. The east coast is especially bad almost all the way down, having, from one to five miles out, a succession of reefs, rocks and rocky shoals.

The west coast, though having deep water in some places, is also very shallow, and though, from the fact that rocky shoals are not met with on this side of the lake,

but sandy and muddy ones, it is not nearly so bad as the east side, it is still quite dangerous enough.

Of the surrounding country, extending back from the lake shore at least some miles, fully four-fifths of the east side and the north end, and fully one-half of the west side, can never by any possibility become a farming country. The rocky nature of the land on the east, and the exceedingly swampy character of the country on the north and northern portion of the west side, make this conclusion a certainty. Neither, to all appearances, will this section just mentioned ever be much of a lumbering district. The only valuable timber found is spruce, and that is always of a small size in swampy land, and is also apparently of a small size in the rocky portion.

With the exception of a slight disturbance noticed in the vicinity of Hole River, no indication of any valuable mineral was noticed either in this large tract, or, for that matter, anywhere around the lake, if we except a thin bed of ironstone which was seen at Grindstone Point, and, from report, the existence of a bed of hematite iron ore on Black Island.

Of the country remaining, more or less of it is an agricultural one, with generally an excellent clay loam soil. Included in this tract also we find the only lumbering interests of any value which came under my notice. We always of course confined our conclusions in this regard to the immediate vicinity of the lake, and as a matter of fact this section, composed of the south half of the west side and the south one-fifth of the east side, includes all the country seen around the lake that is in anyway adapted to settlement.

As a general thing both large and small game are exceedingly plentiful all around the lake, specially is this so on the north and west sides as far south as the Grindstone Point, caribou and moose being found in vast numbers. Fur, also, is still reasonably plentiful, notwithstanding the presence here of the Hudson's Bay Company for so many years. The waters of the lake are also filled with fish of many kinds which are exceptional in point of size and quality.

Whitefish seem to be the predominating variety in point of numbers and are sometimes taken of immense size, as much as 17 pounds in weight, and as for quality, they already have the reputation of being the finest in the world. The other varieties of fish found in the lake are sturgeon, maskinongé, jackfish, catfish, sunfish, toolabies (a variety of whitefish), pickerel, gold eyes, perch and suckers, and the lake literally swarms with them. Thus it will be seen that, if the district visited by us is barren in some respects, vast wealth exists in Lake Winnipeg in its fish, and if proper regulations are enforced its waters may be made to yield a large revenue for all time to come.

With respect to the past season, it may be said to have been a very dry one and the summer very hot. But little rain fell during the entire five months which I was on the lake and as one consequence a number of the smaller streams were completely dried up. Thus the Warpath River, a considerable stream on the maps, had a bank of sand 10 feet high thrown completely across its mouth and there was no river. The level of the lake likewise was reduced from 2 to 3 feet below the average.

The first damaging frosts which visited us occurred on the night of 12th September, so that it will be seen that in some respects the past season was a fine one. Despite the dryness of the weather, however, the growing crops looked well, and, from what I could hear, a fair amount was harvested.

No. 9.

REPORT OF JAMES F. GARDEN, D.L.S.

SUB-DIVISION SURVEY IN KAMLOOPS DISTRICT, B.C.

SIR,—I have the honor to submit the following report of my survey, during the past season, in the railway belt in British Columbia.

My instructions directed me to survey lands applied for, between Spence's Bridge and Shushwap Lake, on the north side of the Thompson River.

I arrived at Victoria on the 7th of May, 1886, and after organizing a party and purchasing supplies, proceeded by steamboat to Port Hammond, on the Fraser River. At this point the Canadian Pacific Railway, after having followed the river for 132 miles, leaves it, taking a north-westerly course to Port Moody, the head of Burrard Inlet, twelve miles distant. The Fraser here is a large and muddy river, over one-half a mile in width. Extensive alluvial flats at the mouth, show the immense amount of earth and detrital matter brought down by it every year. The effects of the tide are noticed sixty miles up the river, from its mouth, and it is navigable on this stretch for 115 miles, to Yale. From Port Hammond we took the Canadian Pacific Railway, passing through the majestic scenery of the Fraser and Thompson River canyons.

We arrived at Spence's Bridge, 166 miles east of Port Moody, on the 16th of May. This point on the Thompson River is about the western limit of the Interior Plateau, or "rolling bunch grass country" of British Columbia, which extends easterly, of an average width of 100 miles, being enclosed on the east by the Gold and Cariboo, and on the west by the Cascade or Coast Ranges of mountains. It stretches north-easterly from the 49th parallel, the southern boundary of British Columbia, over about 5 degrees of latitude, but with a continually narrowing width. This elevated plateau has an altitude of 1,500 to 3,000 feet above the sea, and presents a more or less mountainous appearance. Adjoining the Thompson River, which run in deep valleys, there is usually an open dry flat, or "cottonwood bottom" lands, from a few chains to a quarter of a mile in width. Though in some places abrupt bluffs intrude, or steep hills descend directly to the water's edge, back from these flats rise the benches or terraces, from a few feet to over three hundred feet in height, with, in some instances, an open growth of pine, giving the scene an attractive and park-like aspect. Forming a background to this beautiful view of land and water, are rocky ridges or more gently ascending slopes, reaching to a height of from 1,000 to 1,500 feet or more above the river, usually with a thick growth of pine and fir on the higher portions. The surface is very dry and arid, being deprived of a sufficient amount of rainfall by the Cascade Range, presenting a bold and broken barrier, 8,000 to 10,000 feet high, precipitating the rain-clouds which are borne easterly from the Pacific Ocean. The average amount of rain, in the southern portions, is probably much under ten inches. At Spence's Bridge the meteorological observations, in 1875, gives eight inches rain, three and three-quarter inches snow. There is, therefore, but little vegetation, the larger trees, principally yellow pine and fir, being confined to the higher altitudes, though in some places along the river the pines flourished in open groves, without any underbrush.

Notwithstanding the dryness of the soil, it supports, in many places, a good growth of bunch grass, which has made this portion of the country so famous for stock raising. It was at one time so plentiful that plains and hillsides looked like fields of grain.

It has now become scarce and thin in many places, from overstocking and a succession of exceptionally dry summers. It does not appear to stand continuous grazing,

there being no sward to protect the roots. When the bunch grass has disappeared, wormwood, a species of sage bush, has taken its place. It is much relished by the cattle after the first frosts, and affords good winter fodder. In some of the higher ranges, pea vine and blue joint grasses were observed, and on the river flats wild rye was seen growing to a height of 6 or 7 feet; it is not considered valuable as a cattle food. Stock-raising is the principal industry of the country, agriculture being subsidiary to it. The way in which it has been conducted in the past by men of small means has been to enter for a homestead of 160 acres, under the Provincial rules, at \$1 per acre, situated on the bank of a stream, so that it could be easily irrigated, and in the vicinity, if possible, of a natural hay meadow. A few head of cattle have been the start of most of the present well-to-do stock-men. Sufficient land would be cultivated to supply the necessities of life, and enough wild hay be put up to guard against a severe winter or heavy snow fall, when stock would be unable to graze. Cattle were branded and allowed to roam on the ranges, which are large areas of the public domain, with some natural boundary, such as a high range of wooded hills, or ravines, &c. In the fall they were rounded up by the owners and the calves branded. In this way, by the natural increase in their herds, most of the ranchers have become comparatively wealthy. After the first fall of snow in the hills, usually in November, cattle descend to the lower or winter ranges, and if necessary are fed. At times it has been difficult to procure fodder, and the want of this provision has been the cause, on some occasions in the past, of considerable loss. For several winters past the animals have been able to graze on account of the mildness of the weather. At some of the ranches stacks of hay, of three different seasons' cut, were seen side by side, not having been required.

The profits from this business in the past have been large. The construction of the Canadian Pacific Railway increased the price per head from \$10 and \$15 to \$30 and \$35. Four thousand head were shipped from Kamloops alone this season to the ranges east of the Rocky Mountains. Mr. S. Harper, one of the largest owners on the Thompson River, also sent to the same place between 400 and 500 horses, at \$60 per head.

The amount of cultivable land is small in comparison to the whole country; the greater part being found in the valleys of the larger rivers, and in the vicinity of streams running into them, which afford facilities for irrigation, without which it is useless for agriculture.

On the North Thompson from Kamloops, twenty miles north, to the limit of the railway belt, there are some good flats, varying in width from a few chains to, in one place, a mile. The average, however, is not more than a quarter of a mile. The shore in many places is skirted with cottonwood bottoms which are flooded during high water. The hills bordering these flats are thinly wooded with pine and fir on the tops, near Kamloops, but the trees become thicker and descend as you proceed northward. In this distance there are, on both sides of the river, fourteen settlers, who own in the aggregate about 2,000 head of cattle, the greater number belonging to M. Sullivan and J. T. Edwards, who have extensive ranches or farms on the left bank. The principal crops raised by them are timothy hay and oats for fodder. During the summer hay in Kamloops brings \$20 to \$25 per ton, though sometimes in winter it is double.

The amount of unoccupied land in this section that is supplied with water is small. An area of two or three townships of entirely open hilly or rolling land lies in the north-west angle of the junction of the North and South Thompsons. It is good grazing land, and has numerous ponds in the hollows, most of which are alkaline.

This land has not yet been applied for, although it is one of the most desirable cattle ranches in this part of the country. The large number of cattle grazing on it, together with the drought of the past two seasons, have had the effect of making the bunch grass scarce. Enclosing and preserving it for a year or two would make it as good as ever.

The most valuable stream for irrigation on the North Thompson is Jamison's Creek, which empties into it on the west side about fifteen miles north of Kamloops. From it water is drawn south a mile to land claimed and cultivated by John McAuley, and north half a mile to a leased farm worked by Chinese, who seem to be adepts at the art of irrigation. They raise large crops of potatoes, beans, peas, cabbage, &c., with which the lessee, Hong Lee, supplies the Kamloops market. From the same source Willis, the most northerly farmer on this side of the river, has a ditch of over two miles in length by which he irrigates about forty acres of land, and raises good crops of wheat, oats, potatoes, &c. He had this year peas fit for the table by the last of June. That pest of eastern farmers, the Colorado beetle, has not yet put in an appearance in this part of the world.

The ditches from this creek are very destructive to the fish, with which the stream is well supplied. There are three varieties—the largest, the mountain trout, which weighs from four to eight pounds; the silver trout, a small but gamy fish; and the speckled trout. These fish enter the ditches, at the mouth of which a weir is usually placed, and follow down with the current until finally they reach the field to be watered, where they are left in hundreds upon the ground.

Considerable engineering skill is shown by the settlers in the laying out and construction of their ditches. With a triangle, an A shaped frame of wood, a plumb line attached to the apex, one leg slightly longer than the other so as to give a fall of about an inch to a rod when the line coincides with a certain mark fixed on the cross-piece, they will follow the windings of the side hills, occasionally crossing a ravine with a flume, or passing around some rocky bluff, and rarely fail, when the trial is made, to deliver the water at the elevation calculated upon.

Irrigation has its disadvantages as well as its advantages. The more obvious of the latter is the regularity with which crops may be watered, and just at the right time, independently of chance showers, and the fact that it can be concentrated on one field that may require moisture, while the one adjoining may be left dry to ripen, whereas rain wets all alike. The disadvantages are the cost of construction and maintenance, and with land that has much fall to the surface, the soil is washed from the higher portions to the low lands, leaving the former part, in time, entirely bare of soil.

The north side of the South Thompson, twenty miles east of Kamloops, has but one settlement upon it, that of T. Harper, who has buildings on the shore of the river, nine miles from Kamloops and one mile beyond the Kamloops Indian reserve. This reserve is almost seven miles square, two of its sides being formed by the North and South Thompsons, and includes some of the best river land in the vicinity, as well as valuable mountain grazing ranges. In fact, as a general rule, the reserves for Indians contain some of the best agricultural land of the interior.

East of this Indian reserve the flats are narrow and bordered by steep clay cliffs rising to a height of from 150 to 300 feet. They are very picturesque, being worn and eroded into rude resemblances to tower fort or battlement, the stræ looking like courses of masonry. Above these there is a narrow open bench cut in all directions by chasms and gorges. Beyond and rising abruptly, are the rocky broken and wooded hills. There are but few water-courses entering from the north, and only one with permanent water—a small stream which runs through Harper's rancho. It rises near the valley of St. Paul's Creek, about four miles north. Bordering the stream Mr. Harper owns a cattle range, on which he has at present about 1,400 head.

St. Paul's Creek, which runs westerly nearly parallel with the river, is a good stream, and drains this section of country. It passes through the Indian reserve and enters the North Thompson. The soil all along this stretch of the river is principally boulders, clay with sand and gravel; but owing to the absence of available water is not cultivated, except a small patch near the mouth of the above mentioned stream.

In the valley at the head waters of St. Paul's Creek, about six miles north from the river, are some good natural meadow lands interspersed with willow clumps.

The north side of the valley has an easily ascending slope, bare of trees near the foot, but thickly wooded with "bull pine" and firs towards the top.

On the south, the side rises steeply, is rocky and thickly wooded. A small lake called "Pinnikintan" or "Moccasin Tongue," lies along the base of this ridge, and is at the height of land, St. Paul's Creek running westerly from it, while another small stream rises from its eastern end and runs southerly to the river. There is excellent grazing, the pea vine and other nutritious grass abounding. A settler has squatted here and has started a dairy farm. He has twenty-five milch cows, giving an average yield of three or four lbs. of butter each per week, which he sells at 35 or 40 cents per lb. along the railway, descending the mountain ravines with this produce packed on a pony's back. Roads and conveyance are still in a primitive state.

Crops cannot be successfully raised at this altitude on account of early frosts. Ice formed here on the 13th of August. The valley is about 1,500 feet above the river, and the latter at a point due south, according to the railway surveys, is about 1,200 feet above the sea. Much depends upon the local surroundings as to the height at which cultivation of the soil can be safely carried on. In wide open valleys the frost is not so destructive as in narrow areas confined to high hills.

The most easterly point reached in the survey was at T. Graham's ranche, thirty miles east of Kamloops, and about eight miles west of Shushwap Lake. Most of the land suitable for farming on the river flats has been taken up in this neighborhood, but on the open benches back from the river, and about 150 feet above it, there is some good, open, even land, which could be irrigated by water from the "Neskaulithm" or "Neskaulin" Lake, which lies about two and a half miles from, and 700 feet above the river.

This lake forms part of the west boundary of a large Indian reserve, reaching to Shushwap Lake. Mr. Graham's land is well cultivated and produces large crops of wheat, oats, timothy and roots. During railway construction he received from 3 to 4 cents per pound for potatoes, but now sells them at 2 cents. Butter, of which he manufactures about 120 pounds per week, sells for 40 cents per pound.

In Copper Creek Valley, on the north side of Kamloops Lake, about eight miles from Savona's Ferry, there is a small area of cultivable land, part of which has been taken up by two settlers. It is watered by the creek, which is a small stream. The valley is narrow, and surrounded by high wooded hills. In some of the hollows are found hay meadows.

The sides of the ravine near the mouth attracts attention from the vivid red and green colors of the earth, probably caused by decomposed copper glance. About one-half a mile farther east may be seen a peculiar cluster of denuded hills covered with the same bright hues.

There is very little land fit for settlement along the north shore of the lake, the rocky bluffs and steep hills coming down in most places to the water's edge. At the mouth of the Tranquille River are two good farms and cattle ranges, owned by Wm. Fortune and Chas. Corney, both of whom have orchards which yield largely. They also raise fine melons and tomatoes. Between Cache Creek and the Thompson and Bonaparte Rivers is an area of about 9,000 acres of hilly, open, grazing land, valuable for a winter range, as the snow is said to lie very lightly or not at all upon the hills. Now they have the burnt up look of the rest of the country, caused by the drought of the past season. In the Bonaparte Valley, three miles north of Ashcroft, His Honor Governor Cornwall's residence is on an extensive flat, which would make a very productive farm if water were brought to it.

Governor Cornwall has extensive grain, meadow and grazing lands, the former being irrigated by water from Ashcroft Creek, a mountain stream that rises from a small lake about 500 feet above the flats and five miles inland. The supply from this source at present is limited, but it is supposed by erecting a dam sixty or seventy feet long at the outlet of the lake its capacity would be increased from seven to eight feet in depth over an area of 300 or 400 acres. This would retain the snow waters of the spring and greatly augment the available supply during the summer months,

a result much to be desired in the interests of a band of about forty Indians who have a "rancherie" or village near the waggon road, on Ashcroft Creek. At present they have no water and are unable to raise any crops.

Mr. Henry Cornwall showed me some fine specimens of apples raised in his orchard, which bore an immense crop this year. All that I have seen confirms what has been frequently stated—that this portion of British Columbia is eminently adapted to the growth of fruit.

The Bonaparte Valley north of Cache Creek contains some good farms watered from that river, but the area is not great, and the most of it in the southerly portion is taken up and occupied. The valley has a width of from twenty to forty chains, and the bottom adjoining the stream is still in many places covered with a thick growth of willow and poplar. Mr. Philip Parks and Mr. T. Morgan, who have productive farms cleared from these bottom lands, informed me that they had raised this year about ten tons of potatoes to the acre, which they sell for $1\frac{1}{4}$ cents per pound. Onions and squashes shown me were the finest which I had ever seen. Their crops of other vegetables were also very large. The average yield of oats and wheat here is: oats 1,500 to 1,800 lbs. per acre; wheat, 1,500 to 2,000 lbs. per acre, bringing this year $1\frac{1}{2}$ cts. per lb. These crops this year, however, were hardly up to the average.

Mr. Semlin, M.P.P., pointed out a field of 40 acres off which he threshed one year 80,000 pounds of oats. Manuring or succession of crops are but little attended to, so that of late years the results have not been so good for cereals. In Cache Creek valley there are some excellent meadow and cultivated land watered by the creek, the most easterly being Mr. J. Wilson's. He raises a considerable crop of hay and oats for cattle feed. He has about 2,000 head in different parts of the country.

Between Ashcroft and Spence's Bridge there are only a few small isolated patches of arable land, the country being rocky and hilly. At Spence's Bridge there is a small flat. Most of it is taken up by two residents, one of whom, Mr. John Murray, has a garden in a very good state of cultivation in which he raises vegetables and flowers for seed. He is building up a good business in this line, supplying dealers in different parts of the country. He considers the climate and soil well adapted to this industry. A large stream enters the river on the right bank about a mile below the bridge. It comes over a precipice with a sheer fall of 100 feet, forming a beautiful cascade. A flume has been built one mile long from it at a cost of \$2,700, including a short tunnel through the rock at the falls.

The roads are generally first-class, being well located, and constructed by the local Government at a large cost. The Yale and Cariboo waggon road is the principal one. It follows the Fraser and Thompson Rivers to Ashcroft, whence it runs north-erly, passing through the Bonaparte River valley, and by Clinton, 38 miles north of Ashcroft, to the Cariboo mining regions. At Clinton, the Foster Mining and Milling Company are erecting quartz crushing machinery for the purpose of working a vein which is said to promise a large yield of gold.

In the section of the Province in which this survey was made no gold mining of any importance is being carried on, although it is possible to get a "color" in any of the creeks or rivers. This indicates its presence, probably in large quantities, in the mountains. \$50,000,000 have been taken out of British Columbia by placer mining in the past.

With capital directed to the development of many rich quartz veins which are located, there is every reason to believe that it would give as good results in the future. Many quartz veins were seen, but all of them have been prospected, as this part of the country is accessible. Further than a temporary excitement nothing has resulted from them. Jamieson's Creek is one of these places. At present there are on this creek and Lewis's Creek, which also empties into the North Thompson River, gangs of Chinamen engaged in gold washing. On the Tranquille River they have been working for 20 years past, and have built houses and cultivated small gardens. A few were seen on the Bonaparte River. It is difficult to ascertain the results of a Chinaman's labor. The invariable reply as to how much each man makes is "six

bit" (75 cents) per day. This is considered fair wages for them, but it is probable that they make much more. A fair index of their prosperity, as of that of white men, is the purchases they make. Several settlers informed us that when able they lived well, buying chickens and pigs, their favorite meat, and vegetable regardless of cost.

The Siwash and his *klootchman* (the Indian and his squaw) do a good deal of gold washing on the bars of the Fraser and Thompson Rivers, as well as numerous Chinese. Both of these races make good livings on claims long since abandoned by the whites.

The climate of the Thompson River valley is warm and dry, with cool and refreshing nights. The thermometer on several days rose to over 100° in the shade. There were but few days on which the sun was obscured by clouds, but for a month or six weeks during part of July and August the air was thick with smoke from bush fires which were burning in all parts of the country, particularly along the railway. It was occasionally impossible to see across the Thompson River, a distance only of eight or ten chains. The rain fall was very light. The whole time in which it fell would not amount to two days; and but one-half day was lost during the entire summer from this cause. The fall weather up to the middle of November is the most perfect and enjoyable to be found in any country—bright warm days with just a tinge of frost in the air towards the approach of winter to make work and exertion a pleasure. The nights were cool, and for the last few weeks a small amount of ice formed. In winter, according to information received, the weather is not continuously cold, though for a few days the thermometer may fall to zero or considerably below. But that it does not remain for a long period at this low temperature is testified by the character of the houses built by the old residents, which are not calculated to keep out excessive cold, one or two additional fires being all the precautions taken.

The snow fall varies, being of course greater in the hills and high land than in the valley adjoining the river, where it is comparatively light.

The returns from agriculture would be more secure and certain if it were greater in the hills than has been the case for the past winter or so, as after winters of heavy snow falls the streams upon which irrigation depends are more constant and sustained.

Among the trees noticed the principal one is the yellow or pitch pine, which grows up to 3 feet in diameter, and has a smooth, straight stem for 20 or 30 feet without branches. It flourishes in open groves or parks, without underbrush, often attaining a height of 100 to 150 feet, and presents a most striking and handsome appearance. The lumber manufactured from it is used locally. On the higher altitudes it gives place to fir and some balsam. Along the banks of the streams and rivers the aspen poplar, alder (which grows to 10 or 12 inches in diameter) and willows are found. The cottonwood, a species of poplar, which reaches a size of 3 feet in diameter, was also found along the rivers. The "black" or "bull" pine, a coarse species, was also noticed among the coniferæ. The tamarac, or larch, was observed in marshy situations in the hills. Small white and black birch trees were seen. The only large cedar observed was in the vicinity of Neskaulithm Lake.

The soils on the area surveyed change from "boulder clay," with sand and gravel on the higher land, to clayey and sandy loams in the bottoms and river flats, mingled with detritus from the disintegration of the surrounding rocks. They seem to be of the most fertile character, as the large crops raised where irrigation is carried on prove.

In the interior there are long stretches of the Thompson Rivers and connecting lakes which are navigable for steamers of light draught. From Savona's Ferry—the foot of Kamloops Lake, which is a widening of the river to an average of 1½ miles for a length of eighteen miles—to the head of Shushwap Lake, is a distance of about 100 miles of uninterrupted navigation. During high water the North Thompson is navigable to Clearwater, a distance of seventy-five miles. At present there are a number of steamers plying on these waters carrying freight and goods from points on the railway to the interior settlements, and in return taking their produce, etc. (from their very doors) to a market.

The class of settlers who would succeed in this country are those who could command a small capital to start in farming combined with cattle and sheep raising. For the latter business there is a large area of suitable rocky and hilly land. At present there are not many sheep in the interior. There is a growing demand for wool on the Pacific coast. A woollen mill has recently been started at New Westminster.

Fruit culture, including grapes, will prove an important industry, but it does not yield an immediate return of itself. The man of small means should carry it on in connection with general farming.

The cost of getting water for irrigation is the most serious expenditure which the settler has to meet. It is almost impossible to state the amount necessary for this purpose without knowing the local circumstances, but as a general thing it may be stated that a mile of ditching will cost between \$200 to \$300. One settler informed me that a ditch five miles long cost him \$1,800 when wages were \$50 per month and board. White laborers can be got now from \$30 to \$40 per month and board.

If private or Government capital were applied to the carrying on of irrigation work on a large scale from the rivers and larger streams, charging a rental to the consumers, as is done in many places in California, large tracts of land, which at present are dry and barren, would be made most productive and would eventually give a good interest on the money invested, a large population could be supported, and the country would make rapid progress.

The lumber business will be developed now that the completion of the Canadian Pacific Railway renders shipment possible. There is at present a steam saw-mill at Kamloops, and another which was burnt down in June last was run by water power at the mouth of the Tranquille River. During the railway construction rough lumber brought \$20 per 1,000 feet; it can now be got for \$14 per 1,000 feet. Grist mills are also run in connection with them, and another one is situated at the mouth of the Bonaparte River, furnishing a ready market for wheat.

Attached are the thermometer readings taken during the season.

I have the honor to be, Sir,

Your obedient servant,

JAMES F. GARDEN, *D.L.S.*

E. DEVILLE, Esq.,
Surveyor General,
Ottawa.

THERMOMETER READINGS (in shade) in the Thompson River Valley, Summer and Fall of 1886.

Date.	7 A.M.	2 P.M.	6 P.M.	Remarks.
June 1.....	.....	.....	.....
do 2.....	.....	.....	.....
do 3.....	.....	.....	.....
do 4.....	.....	.....	.....
do 5.....	62	98	86	Fresh breeze from S.-W.
do 6.....	62	86	76	100° at 4 p.m., light sun shower; cool night.
do 7.....	52	80	64	Cool breeze, cloudy cold weather.
do 8.....	.....	.....	.....	Cool wind, slight shower.
do 9.....	60	79	70	Cool S.-W. wind.
do 10.....	56	.....	62	Cool wind from N.N.-E., heavy wind and shower in p.m.
do 11.....	57	64	62	Cool, cloudy, slight showers.
do 12.....	54	.....	64	Clear weather, cool S.-E. winds.
do 13.....	58	82	78	Cloudy, thunder and heavy squall from N. in p.m.
do 14.....	.....	87	.....	Fresh warm breeze.
do 15.....	62	.....	.....	Very hot.
do 16.....	60	71	62	Quite cool, slight thunder shower in p.m.
do 17.....	62	71	72	Cool, pleasant day.
do 18.....	60	.....	57	Very cold rain storm, cool all day.
do 19.....	56	.....	82	Fine day.
do 20.....	72	78	.....	do warm.
do 21.....	62	.....	74	do do
do 22.....	.....	105	79	Hot day.
do 23.....	76	.....	79	Pleasant.
do 24.....	.....	.....	.....
do 25.....	55	.....	86	
do 26.....	56	.....	58	Heavy wind storm, and slight shower.
do 27.....	58	80	58	
do 28.....	57	78	62	Quite heavy shower in a.m.
do 29.....	52	.....	72	Light shower.
do 30.....	59	.....	70	Heavy thunder shower.
July 1.....	68	78	62	Pleasant day, slight shower.
do 2.....	57	.....	67	do
do 3.....	57	.....	79	Cool, pleasant day.
do 4.....	.....	71	58	Mild day, cloudy p.m.
do 5.....	55	.....	68	Shower in a.m.
do 6.....	65	92	78	Hot, sultry day.
do 7.....	86	95	92	Very warm day; a very heavy peal of thunder during night.
do 8.....	90	.....	.....	do
do 9.....	62	78	68	do
do 10.....	56	.....	82	
do 11.....	64	104	86	Very hot, reading at 4.30 p.m., 108°.
do 12.....	86	104	90	do
do 13.....	60	.....	.....
do 14.....	.....	90	86	Highest temperature during day 93°.
do 15.....	.....	.....	.....	No available shade in vicinity of camp.
do 16.....	.....	.....	.....	do do
do 17.....	.....	.....	.....	Fine, dry, warm and smoky.
do 18.....	.....	.....	.....	do do
do 19.....	60	.....	68	Very smoky, no wind.
do 20.....	56	.....	70	do
do 21.....	68	89	68	Very smoky, light breeze in evening.
do 22.....	58	94	87	Smoky but clearing, good breeze.
do 23.....	.....	.....	.....	Moving, and at Kamloops.
do 24.....	.....	.....	.....	do
do 25.....	.....	.....	.....	do
do 26.....	.....	.....	68	do
do 27.....	61	86	69	
do 28.....	52	94	76	
do 29.....	62	92	78	Maximum 100° at 3 p.m., slight thunder shower.
do 30.....	70	100	78	Cooler evening, slight thunder shower.
do 31.....	64	.....	72	

THERMOMETER READINGS (in shade) in the Thompson River Valley, &c.—Continued.

Date.	7 A.M.	2 P.M.	6 P.M.	Remarks.
	°	°	°	
Aug. 1.....	78	108	79	Very warm day (distant thunder).
do 2.....	68	.....	79	Warm clear day.
do 3.....	62	.....	78	do
do 4.....	60	.....	79	do
do 5.....	66	.....	79	
do 6.....	40	.....	79	Camped in mountains (cold night).
do 7.....	49	.....	69	do do
do 8.....	50	78	60	do do
do 9.....	50	62	54	Very cold day, slight shower.
do 10.....	52	.....	68	
do 11.....	55	.....	65	Cool and cloudy.
do 12.....	55	.....	65	Rainy night, cool day.
do 13.....	30	.....	68	$\frac{1}{2}$ -inch of ice on water pail.
do 14.....	58	68	66	Heavy thunder shower (tree struck by lightning 40 chains from camp).
do 15.....	58	78	58	
do 16.....	55	.....	74	
do 17.....	50	.....	78	5 a.m. 29°, very cold night.
do 18.....	60	.....	80	Warm day, smoky.
do 19.....	62	.....	86	
do 20.....	62	.....	86	Fine day, good breeze.
do 21.....	64	.....	76	Heavy blow from S.-W.
do 22.....	64	.....	72	Fine warm day.
do 23.....	.....	.....	.....	Moving camp.
do 24.....	.....	.....	.....	do
do 25.....	.....	.....	.....	do at Kamloops.
do 26.....	.....	.....	.....	do
do 27.....	62	.....	62	Fine day, little wind.
do 28.....	64	.....	66	do fresh breeze in p.m.
do 29.....	68	88	62	do warm day.
do 30.....	66	78	62	Rather warm.
do 31.....	50	78	70	Beautiful day, quite cool.
Sept. 1.....	54	.....	58	Smoky.
do 2.....	58	.....	52	Light shower in p.m.
do 3.....	44	.....	52	
do 4.....	48	.....	48	Cloudy and cold rain in p.m.
do 5.....	42	68	63	Fine day.
do 6.....	43	.....	68	Cloudy, slight shower.
do 7.....	64	.....	73	Very fine day.
do 8.....	56	.....	.....	Fine warm day.
do 9.....	58	78	72	do cool N. breeze.
do 10.....	76	.....	70	Fine warm day.
do 11.....	54	.....	74	do
do 12.....	56	86	70	do
do 13.....	64	.....	72	do
do 14.....	68	.....	71	do
do 15.....	66	.....	62	Slight shower.
do 16.....	54	.....	64	Slightly cool and cloudy.
do 17.....	50	60	86	Cool, cloudy day.
do 18.....	54	.....	66	Bright warm day.
do 19.....	44	78	72	Fine day, smoky, little wind.
do 20.....	50	.....	54	Clear, fine day, fresh breeze in p.m.
do 21.....	55	74	48	do do
do 22.....	48	.....	48	Cold rain, cloudy.
do 23.....	44	.....	54	Cool, cloudy (white frost).
do 24.....	54	.....	.....	Cool and cloudy.
do 25.....	55	.....	.....	Rain in valleys, snow on hills.
do 26.....	.....	.....	.....	Fine weather; moving camp.
do 27.....	.....	.....	.....	White frost.
do 28.....	.....	68	64	
do 29.....	46	.....	67	Cool pleasant day.
do 30.....	44	.....	64	Fine day.

THERMOMETER READINGS (in shade) in Thompson River Valley, &c.—*Concluded.*

Date.	7 A.M.	2 P.M.	6 P.M.	Remarks.
	°	°	°	
Oct. 1.....	46	.....	66	Beautiful fall weather.
do 2.....	50	.....	62	do
do 3.....	46	.....	64	do
do 4.....	48	.....	63	do
do 5.....	50	.....	68	do
do 6.....	52	.....	62	Violent gale and sand storm in p.m.
do 7.....	48	.....	58	Strong southerly wind in p.m.
do 8.....	49	.....	68	Strong southerly wind.
do 9.....	50	.....	54	Slight shower in p.m.; snow on mountains.
do 10.....	32	.....	58	Cool day; snow on hills, 3,000 ft. altitude.
do 11.....	34	.....	48	Ice on wash basin.
do 12.....	34	.....	47	Cool, pleasant day.
do 13.....	38	.....	44	Rain in a.m.; snow on mountains.
do 14.....	37	.....	48	Cloudy and misty on mountains; little rain.
do 15.....	34	.....	32	Snow hurries all day.
do 16.....	32	.....	40	Cold, windy day; plenty of snow.
do 17.....	40	54	38	Fine, clear day.
do 18.....	34	.....	37	Very fine and warm, clear.
do 19.....	30	.....	40	
do 20.....	32	.....	44	Cool, clear, pleasant day.
do 21.....	43	.....	49	Cool and pleasant.
do 22.....	49	.....	47	do and cloudy.
do 23.....	43	.....	34	Pleasant, but cooler in p.m.
do 24.....	21	50	44	Heaviest frost of the season.
do 25.....	36	.....	56	Cool, pleasant and cloudy in p.m.
do 26.....	50	.....	57	Cool and high wind.
do 27.....	48	.....	54	Warm, windy and cloudy; slight rain.
do 28.....	34	.....	42	Cool and cloudy.
do 29.....	20	.....	32	do
do 30.....	32	.....	34	Cool, pleasant day.
do 31.....	26	48	44	do
Nov. 1.....	34	.....	34	Cool and cloudy.
do 2.....	34	.....	37	
do 3.....	46	.....	50	Cool; very windy (squally).
do 4.....	.....	.....	26	Cool in p.m.
do 5.....	22	.....	28	Cool, clear day; little wind.
do 6.....	.....	.....	36	Fine day; slightly warmer.
do 7.....	34	.....	36	
do 8.....	32	.....	36	
do 9.....	18	.....	28	Clear, fine day; lowest reading up to date.
do 10.....	14	.....	28	
do 11.....	22	.....	32	Quite warm day.
do 12.....	41	.....	38	do heavy gale about noon.
do 13.....	26	.....	28	
do 14.....	10	.....	16	Lowest reading recorded.
do 15.....	16	.....	.....	Travelling to Spence's Bridge.

JAMES F. GARDEN,
Dominion Land Surveyor.

VANCOUVER, B.C., 8th January, 1887.

No. 10.

REPORT OF THOMAS FAWCETT, D.T.S.

SUB-DIVISION SURVEY IN KAMLOOPS DISTRICT.

GRAVENHURST, 15th December, 1886.

SIR,—I have the honor to transmit herewith the following general report of my survey and impressions of that part of British Columbia which came under my notice during the past season.

In compliance with instructions, dated Ottawa, 16th of April, I left Gravenhurst on the 22nd of the same month, and after obtaining further instructions and instruments at Ottawa, proceeded to Victoria *via* Northern Pacific Railway, the Canadian Pacific Railway not being open at that date, arriving there on the 7th of May. My first duty was to make a copy of a map compiled by Mr. Tom Kain, D.L.S., showing that part of the Province where my surveys were projected. This I did, obtaining all the information I could, in which Mr. Kain assisted me in every way. Having secured my party and forwarded supplies, I proceeded towards Spence's Bridge, calling at the Dominion Lands Office, New Westminster, where, through the kindness of Mr. Aikman, the agent of Dominion Lands, I obtained a list of the names of persons who had made application for land within the district over which my surveys were to extend.

My primary impressions regarding the land passed by boat and train were not very flattering. Along the valley of the Fraser, on the flats, farms were seen where vegetables, fruit trees and cereals appeared to flourish with promise of an abundant harvest, but some of the farmers with whom I conversed were afraid that in time of high water, which reaches its maximum usually in the month of June, many of their fields might be inundated and the crops destroyed. This does not often occur, and yet the possibility of such an event causes a feeling of insecurity. The floods are caused by melting of accumulated snow in the mountains when the weather becomes very warm, so that a long continued period of very warm weather, early in the summer, might enlarge the streams to unusual proportions and do considerable damage.

With regard to the mainland, a few miles up the river the banks rise high above the high water mark, but the large firs and pines which clothe the hills and lower plateaus, and which are valuable for lumber, seem to dishearten those who come out with the intention of clearing the land and making for themselves a home. This too is a rainy district, which renders the operation of clearing the land very much more difficult. In many places along the Fraser and Thompson Rivers, groups of people, mostly Chinese and Indians, were seen washing and sifting the sand for gold. At this work I was informed they would obtain from 75 cents to \$2 per diem. The Canadian Pacific Railway, which follows the right bank of the Fraser River, winds around numerous sharp curves and through tunnelled mountains until it leaves the Fraser and ascends the Thompson from its mouth to the source of the South Branch. There are many deep cuts on this part of the road, and boulders projecting from the sides of the banks high up show that there will be work on these sections for some time to come cutting down the slopes and removing boulders from the banks. Spence's Bridge being the westerly limit of the work assigned me, I had forwarded my freight to that point intending to start there and complete the work as I went. Appearances at this place indicate that surveys would not be required to any extent as the hills rise from the river abruptly for from 600 to over 1,000 feet and appear to be composed principally of drift sand, with steep projecting rocks cropping out which are metamorphic and blackened with iron stains.

On the south-west side of the stream here crossed by Spence's Bridge, a bridge on the old stage road, is a flat, containing some 200 acres, most of which belongs to a Mr. John Murray, an enterprising Scotchman, in whose garden I saw fruit and flowers of many kinds, also vegetables, which were far advanced, some being ready for the table on the 24th of May. Mr. Murray has a hot house also, where plants of many varieties are grown from seed, and he expected that this year both his garden and nursery would pay a surplus over the expenditure in capital and labor to produce the season's crop.

As far as the adaptability of the country for settlement in this locality is concerned, appearances from the railway are certainly against it. Mr. Murray informed me that four or five miles back from the river, there are many little plateaus which could form a nucleus for a home, and be irrigated easily from the mountain lakelets and streams, while the surrounding hills would do for pasture land.

Having received by telegraph the geographical position of the astronomical station at Kamloops, I reshipped my outfit and supplies from that place, sending most of my men and pack horses by the road, took train and boat to Kamloops, and a few days later was joined by my party, who were on hand as soon as the supplies. The country around Kamloops presents a somewhat more favorable appearance than that further west, and, my surveys beginning here, I was enabled to make a more complete examination into its fitness for settlement. From my list of applicants, I found that a large percentage of the land for which applications had been made could be reached by running a line south between Ranges 17 and 18, and extending my lines east and west therefrom. From the astronomical station checked by notes of C.P.T., which had just arrived, the township corner between Ranges 17 and 18, Townships 19 and 20, was established by Mr. Garden and myself. Mr. Garden ran the meridian therefrom north across the Thompson River, as a base for his surveys up the North Branch, while I ran the line south, and the outlines of Sections 25 and 36, 19, 18.

Township, 19, Range 18.

Mr. Guerin, a squatter, was located almost on the dividing line between Sections 25 and 36, his improvements comprising a part of four quarter sections. Where his improvements are made is a flat containing about forty acres, which can be irrigated by bringing the water from an alkaline lake, about two miles south-west. The remainder of the land in the sections is made up of high hills, some of which are rocky, and their northerly slopes covered with timber, generally pine and fir, but not in great quantity. In this township are two other applications for land required for grazing purposes. One by Mr. James Miller, for land adjoining lots 311, 312, and 313, which we found to be in Sections 9, 10 and 11, 19, 18. This land for which patents had already been issued, was a flat adjoining Jacco Lake, out of which flows a beautiful stream of water, which is used by Messrs. Miller and Jones for the purpose of irrigating their land down nearer to Kamloops.

Having produced the township outline between Ranges 17 and 18, south to the fifth correction line, I ran that line four miles west, posting the lines, for sections, on both the north and south sides. I then sub-divided the south-east corner of the township, taking in Sections 1 to 5 and 12 to 8. Most of the land in these sections had been applied for by Mr. Miller and Mr. Victor Guillaume, the latter having a house, a stable, and about three miles of fence on the land, which he wishes to purchase. Probably two or three more settlers could find a piece of land to irrigate, from which they might possibly obtain water, and which would form the salient point for a stock farm in this township, this being the only purpose for which the land is specially fitted, in consequence of the dry climate and high hills, which could not be irrigated. The land throughout the township seemed to be pastured to its full capacity. Hundreds of cattle and horses were scattered over the hills, and wandered about with unlimited freedom. In bygone days stock farmers have had the free use of the country, their stock having run at large all the year round, and even in the future those who secure the small percentage of land which contains the water,

and can be watered and made to produce crops, may almost count on having the use of the pasture land free, as man and beast cannot exist without water. In order to make the best use of the land, it would be well to sell or lease it in large tracts to those who are already in possession of the watered lands, or to companies who may require it for stock-raising purposes. Both cattle and horses thrive well on this land, all the animals being sleek and fat. The favorite places for them to feed are the almost bare gravelly hills, where the bunch grass grows fine and wiry. In the summer the high rich looking grass of the wooded regions is scarcely touched.

Large agates and *geodes* were seen on some of the hills, but I did not notice any of very fine quality. In the southern part of the township I noticed several large masses of rock, composed of pebbles, and known as pudding stone. The south-west corner of the township is mostly covered with timber—pine and fir—ranging in size from 6 to 60 inches in diameter. As a rule the branches grow too near the ground, and consequently the timber is not adapted for a good grade of lumber.

Township 18, Range 18.

The entire area of this township, with the exception of four or five sections at the north-east corner, is timbered pine and fir. The surface from the easterly boundary which has been surveyed rises by successive steps and undulations more or less abruptly towards the south-west. The greater portion of the timber passed through was of fair quality and large enough for manufacture, and, in a few years' time, this may become valuable. The soil in the woods where examined was of better quality than that in the open, being a deeper loam, more free from gravel. A growth of rich colored grass called by the settlers "mountain grass," intermixed with pea-vines and vetches, covers the surface of the ground, so that the wooded part of the country affords pasturage to nearly the same extent as the open plains, and considering the admixture of pea-vines it should be about as good. Settlers report that neither the cattle nor horses will eat the grass which grows in the sheltered woods, but this I found was not the case with my pack horses as they seemed to eat it with a relish. The only feature which would render this section unfavorable for agricultural purposes is the question of water. Small streams and ponds are pretty liberally distributed, but are not of such size nor so situated as to permit of watering more than a few small patches of land. Of course the surface is very rough and hilly, but still a large percentage could be worked if a system of irrigation could be obtained. Two settlers who have made applications for land have their improvements in Sections 36, 35, 26, 25 and 24. Lot 314 surveyed some years ago for Mr. Hull by Mr. Dewdney was formed to occupy a part of Sections 25 and 26, and was not shown on the Government maps as they did not know where it was situated. The land in question comprises a meadow and flat surrounding a lake. Hull Brothers have made application for the land adjoining this on the north, part of which they have fenced and have pastured for a number of years a good many cattle and horses. On a part of Section 25, adjoining Hull's lot, on the east, is one Menauteult, who had several acres of grain sown which looked thrifty, although it had not been watered by irrigation. This was growing on a flat through which runs a living stream of good clear water. Grain of good quality, oats and wheat, had been grown and matured on this flat last year, and present indications for this year's crop are as favorable, since it does not appear to have suffered through the absence of rain. I may add that slight showers of rain fall on the mountains and the lands at the base when there is not a drop further out on the plains. This may in some measure account for the freshness of the grass which grows in the woods as compared with that of the open country.

Township 17, Range 17.

This township is mostly bush, only the easterly tier of sections and a few adjoining the southerly limit are open country. The timber is pine and fir of pretty large size near the border of the woods, but after you penetrate the timbered country about a mile the trees are much smaller, being mostly pine, standing as thickly on the ground as they can grow. These are suitable for rails, which can be made

rapidly, and the supply is almost inexhaustible. I penetrated the woods with my survey in this township for several miles as there was one lot for which several applicants had filed claims and were anxious to know where it was, so as to secure it if possible. I found the bone of contention to be a meadow containing not more than twenty-five acres, the rest being bush, and I find that a great many of the lots for which requisitions have been made are of a similar nature. The people agree that the lands adjoining are worthless, being timber, and that no one will ever want to settle on the sections, and consequently they should be allowed to purchase the meadows and not be required to pay for any thing else. The account given of the effects of climate on the crops by different persons is very contradictory. The majority of the people met have volunteered the information that grain would not mature in consequence of summer frosts. On the 4th of July, I was conversing with one of the oldest inhabitants who has his residence at the east end of Stump Lake on the Nicola Road, and another man a brother of the former who had his farm on the hills near by, and both these men said they had raised crops for many years and never yet had anything injured by summer frosts. This confirmed me in the opinion which I had formed previously, that the crop failures which had come under my notice as being the results of summer frosts—so the settlers informed me—were more generally the result of insufficient irrigation. There were only two resident settlers who had applied for homesteads in the township at the time of my survey.

Township 16, Range 18.

There are applications for land in this township by Messrs. Aird, Scott and Tannahill which were found to be in Section 33. The east half of the section comprises a valley through which meanders a beautiful living stream that could be used to irrigate the land, and the locality would be suitable for a place of residence. The land surrounding the valley is exceedingly hilly and is first-class grazing land. Mr. Aird who resides below on the same stream just south of the railway belt, has a considerable area under crop which gave promise of a very rich return. On the west side of the stream the country is mostly timbered for two or three miles, this being superseded by rocky hills which rise to an altitude of from 2,000 to 3,000 feet. In this part of the country deer are very numerous and grouse plentiful. Some distance up the creek in Township 17, are said to be some meadows, but none of large size. The northerly limit of this township at the west side will leave the railway belt. About a mile south from the north boundary we find ourselves on the bank of Stump Lake, and 700 feet above it. The descent is made for about a mile by several undulations. At a guess the lake would cover about 1,600 acres, water is clear and comparatively free from alkali. From the top of the hill other lakes were seen towards the south-west along the Nicola Valley. On the south side of Stump Lake some parties are mining for silver and are reported to have fair prospects. The lake and these mines are out of the railway belt.

Township 16, Range 17.

The north-east end of Stump Lake, which extends about half a mile east from the westerly limit of this township in Section 30, is within a few chains of twenty miles from the railway. Near the lake in this section is the residence of Mr. Peter J. Fraser, whose land is partly within and partly beyond the twenty-mile limit. Mr. Fraser, who was one of the pioneers, speaks well of the country, when it can be irrigated, as a grain and root growing district, and says he never had his crops destroyed by early frosts which seems to be a general ground of objection to the country according to the testimony of many others. A lot purchased by William Palmer and patented since the transfer of the Belt to the Dominion Government is composed of a part of Sections 27, 28, 33 and 34. East of Palmer's land Mr. Frisken has settled and had in about six acres of crop. Mr. Palmer had put in some grain on his lot, but both he and Mr. Frisken were expecting their crop to be injured by frost, as their land is situated about a thousand feet above Stump Lake. A stream of clear and fairly good water which is used by Fraser, Palmer and Frisken to water their land, flows

westward through their lots and empties into Stump Lake. The limit of the railway belt will vary from one to two miles south from the north boundary of this township and the land, with the exception of the lots already occupied, is suitable for pasture.

Township 16, Range 16.

Six miles only were surveyed in this township to ascertain the position of a meadow belonging to Mr. Palmer, as Palmer and Scott had made application for lots adjoining. This lot of Mr. Palmer also had been patented since the transfer of the railway belt to the Dominion on the supposition that it was out of the belt. The entire area of this township lies in the mountains and is covered with timber, except a few small meadows that are part of the season under water. The days were quite warm, but indications of frost at night during the month of July were not wanting. The surface, taken as a whole, is more level than that of the open range, and the soil if anything is of better quality; but the super-elevation would render the locality unsuitable for agricultural purposes, and the timber, being mostly pine of small size, is only fit for fencing, building and fuel.

Township 17, Range 16.

Application to purchase meadows, and in one case by different parties for the same piece of land, rendered it necessary to continue my survey into this township, although densely timbered and difficult to make any headway in on account of fallen timber. Section 4 was the location of a valuable meadow containing about 100 acres, which was covered by blue joint grass, and would turn off a heavy crop. This meadow, from what I could learn, was much better than in former years, the reason being assigned to the presence of a beaver dam which kept the land flooded until some time in the month of June, when one of the settlers in search of water to irrigate his crop cut away the dam and let the water off. By means of damming and keeping the meadows flooded in the spring of the year, or until about the middle of June, and then draining, a much better crop of hay can be obtained from these marsh meadows than by any other process, and this reserved water would be available for watering the crops at that time of year when most required. The question of reserving water in all the lakes and meadows is one which should be enforced upon all parties interested. Water rights, or prior rights to the water, is a constant source of litigation, and will become more so unless the laws are so changed that parties will be forced to reserve the water in the spring and not allow it to run to waste and that new settlers may have a right to water to irrigate their land. At the present time in every stream more water has been recorded by the Provincial Government on behalf of settlers than the stream in a dry season will afford without keeping a reserve at the head of the stream. And persons having the first right try to prevent all others from using any water at all, and with this purpose in view they enter into a costly lawsuit which usually terminates without benefiting either plaintiff or defendant. Something will have to be done to afford irrigation facilities for those who came into the country after all the water rights had been given away. If well constructed dams were built at the outlet of the lakes which supply the streams with water, and proper gates were constructed so as to regulate the supply and only let the water run as required, this in itself would be a great improvement and would be the means of fertilizing hundreds of acres which at the present time grow nothing but wild grasses. A number of persons have dams constructed for their own convenience, but these are usually too small to be of much value. In this township there are several applications to purchase swamp meadows, the positions of McDonald, Minger and Fraser being determined by surveys. The practice of stock owners is to bring their stock to the woods in winter when the pasture on the open range is exhausted and to feed them hay when they cannot get enough grass to subsist on. The grass which grows in the woods in the summer time and is seldom eaten then becomes valuable for winter feed, and cattle and horses live upon it the greater part of winter, being fed hay only when the snow becomes very deep, which is not expected oftener than one winter in four, taking the experience of the last twenty years.

A few years ago the settlers never thought of making provision for the winter months, as at that time the grass was so much more abundant than at present that cattle and horses could feed upon it all winter. Eight years ago the hills were covered with a dense growth of bunch grass all the summer long—now the open range, over much the larger portion, is eaten off as bare as a floor, and at this date, August the first, the roots seem parched and dead. In consequence of there being no growth the soil retains little or no moisture, and I think a great injury has been done the country by allowing so many animals to pasture upon it. During the last few months, since the completion of the Canadian Pacific Railway, some thousands have been shipped to the North West which will give the grass a chance to grow again and be a benefit to the place.

Township 17, Range 17.

This township is traversed from north to south by a string of lakes known by the majority of the people as Lake River, which extends the entire length, in a depression about seven hundred feet deep, along which runs the Nicola Trail. There are also several small lakes on the hills which rise on each side of the valley. The banks are steep and broken, and rise by successive steps, until, at the distance of three-quarters of a mile, an elevation of seven hundred feet is reached, and from two to three miles further back another ascent of five hundred feet has to be made, when timber is reached on both sides of the valley. Timber is scattered in patches or bluffs over the entire area, while the east and west boundaries pass through bush most of the way. Two settlers—McDonald and Newman—have resided in the valley for some thirteen or fourteen years, and had quite an area under cultivation, the crop on which looked well. In the north east quarter of Section 35, is the residence of John Peterson, an enterprising settler, who during the last two years had expended between five and six thousand dollars in improving his claim. All his improvements had the appearance of permanency, there being a good substantial frame house, well finished, and substantial outbuildings, also between three and four hundred acres enclosed by a good fence, between thirty and forty acres of which were under crop, and looked well. The most of the land, where the crop was growing, had been cleared. Mr. Peterson wishes to purchase a quantity of land contiguous to his improvements, so that he can keep it fenced, and have pasture reserved for his stock in the spring of the year. The only way in which any of the stock farmers can reserve a piece of pasture for the stock in the winter and spring, is to have a section or so fenced in and not to pasture it off during the summer. With this purpose in view there are several requisitions to purchase. I find that nearly all the stock owners would like to purchase a section or two at a low rate, and have the right to herd their animals out on the open range during the summer. There seems to be a general fear that the Government may sell the vacant lands, in large tracts, to persons or companies who may wish to purchase, and the alternative which they suggest is that a land tax might be charged, and stock owners be required to pay in proportion to the number of heads they keep on the commons. The smaller stock owners think that if the land should be absorbed by a few companies or individuals, the rest might leave, as they could not earn a living without raising stock, which they could not accomplish with any pecuniary advantages unless their animals could run at large. Although the country on each side of the open range affords much timber for fencing, the task of getting it out of the mountains, and building the fences over these high hills, is very great, and makes fencing very costly. Several of the people had ordered wire for fencing, some of which was already on the way. Fish Creek, which rises in a small lake about three miles east of Mr. Peterson, supplies his ranch and that of Mr. Bartlet Newman with water, and then empties into Lake River, along the Nicola Trail, near Mr. Newman's. The water in the stream is clear and almost free from alkali, this being a great advantage in a country where good water is scarce.

Township 18, Range 17.

The same valley which passes through Township 17 of this range is found in Township 18. About the centre of the township a small stream, called Anderson Creek, flowing in a deep ravine, joins Lake River from the west, and four miles north-east down the valley another stream, called Campbell Creek, comes in from the south-east. This latter stream gives its name to the entire stream composed of Lake River, Fish Creek, Anderson Creek and Campbell's Creek, which flows into the Thompson River about twelve miles east of Kamloops. The land rises abruptly from the main valley about 800 feet, and then, by steps, 12 to 1,500 feet farther. From one to two miles west from the easterly limit the country is timbered, and along the westerly boundary most of the way to about half a mile east. The northerly slopes of the hills are also timbered. Several small lakes of brackish water are scattered over the township, one of which in Sections 19 and 30 is a mile long, and at its south end about half a mile wide. The settlers in this township are Bartlet Newman, jun., John Frank, Jordan Shaver and John and William McLeod. Each of these have flats in the valley which passes through the township, have cattle on the surrounding hills, and each wishes to purchase or rent land sufficient for spring pasture for their stock. One or two were making butter, but none on a large scale. Some of the people who have hundreds of cows running at large purchase butter—often of an inferior quality—for table use. I was informed by some of them that they did not make butter because the merchants would not buy it from them, for the reason that they could import the article cheaper than they could purchase from local dairymen. Now, if people can afford to make butter in the Eastern Provinces and sell at from fifteen to twenty-five cents per pound when they cannot feed one-fourth the number of cattle, it would appear to any casual observer that dairying and cheese manufacture should offer to those possessing cattle and pasture the means not only of living but of obtaining plenty, as the lowest figure I have heard of as being paid for butter was not less than thirty-five cents per pound, and in buying from the makers at their houses or having it delivered by contract the usual figure is fifty cents. A very small percentage of the entire area would admit of irrigation, and so with the exception of the few flats already taken up, the township is not adapted for agricultural purposes.

Township 19, Range 18.

Entering this township a mile and a half north from the south-west corner and leaving it at the same distance from the north-west corner is Jacco Creek—a stream which, in places, is said to never run dry, but Mr. Miller who has lived on the bank for twenty years says he never saw it so near dry as it is this summer. The hills rise several hundred feet from the valley of the stream on both sides, and from the centre of the township the surface falls more or less abruptly upwards of 1,000 feet to the Thompson River. Messrs. Jones and Miller who reside on purchased lots situated on Jacco Creek, and Mr. McConnell who had a lot back on the flat near Separation Lake, with their hired help, are the only settlers. Mr. Miller who has a plentiful supply of water during the earlier part of the season, and a considerable area under cultivation raises first-class crops of wheat, oats, peas and timothy, also roots of all descriptions and fruit. What Mr. Miller is doing every year only illustrates what the capabilities of the country would be if some general system of irrigation could be adopted, or if the seasons should so change as to afford a natural water supply. That some years ago the rainfall was sufficient to secure abundant pasturage is asserted by many witnesses, that the period will again come may be reasonably expected. In reference to the climate most of the people testify that it is all they could wish. A few of the people complain that the winters are cold and the snow deep, but this is the exception and not the rule. The hills as the river is approached break off into many precipitous banks which may be of clay, sand, or gravel, according to locality and the geological formation which is variable. East of Kamloops these valleys of denudation extend from half a mile to a mile into the hills, and in appearance are similar to the cut banks of the valley of the Red Deer River in the

North-West Territories, and are very difficult to chain over accurately, and could not be done satisfactorily without the aid of the clinometer for taking the angle of inclination.

Township 19, Range 16.

Entering this township in Section 6, flowing into Thompson River in Section 36, is Campbell's Creek, a stream upon which all the settlers in the township depend for their water supply. There are on deeded lots Messrs. Campbell and Todd, while five others have taken land as squatters. The settlers, with one exception, have built their houses in the narrow valley or gorge through which the stream meanders, and are preparing the land for cultivation by cutting and clearing away the timber. Clearing this land will involve about as much work at a greater cost than would be required to clear land in the north part of Ontario. The width of the flat between the banks varies from a few feet to half a mile, and the soil where boulders are not too numerous is of first-class quality. The squatters settled on the land last summer had in a small crop. All crops looked well. My opinions concerning immigration have become much more favorable than at the beginning of the season. I can now understand why many people prefer that method of watering their land to having to depend upon the rain. Irrigation will always insure an abundant crop, while in all countries where the rainfall is depended upon, some seasons there will be a scarcity or a surplus of rainfall, and a partial failure of crop follows. Another consideration, the water contained in the lakes holds in solution much of the fertilizing mineral and vegetable matter collected from the surrounding high ground, and this becomes an unfailing source of food to the growing plants, and the land is constantly enriched, so as to produce crops each successive year without failing in any degree. In meadow lands, if the ground is watered after the first crop of timothy has been taken off, the growth is so rapid that a second crop, nearly as abundant as the first, may be obtained, and about twice as much per acre realized as could be acquired under other circumstances. Another advantage is secured by preserving the crop in good shape, free from the bleaching to which so much of it is exposed in the countries where there is an abundant rainfall, to which may be added a greater degree of personal comfort in working, and entire freedom from the mental strain and hurry which is occasioned by what is popularly known as "catchy seasons."

One young man (Mr. Buse) who, with the assistance of one hired man, milked fifty cows, and cultivated four acres of ground, gave an estimate of the profits which might be expected from that line of business. Allowing calves to have a portion of the milk, each cow would produce about three pounds of butter per week for five months of the twelve. This season Mr. Buse has had market for all the butter he could make, receiving for the greater portion of it fifty cents per pound.

The average price of milch cows would be fifty dollars each, and help could be obtained at from \$30 to \$15 per month, or at a cost of \$50 per month without board. By allowing the increase as equivalent to the depreciation in value by age and loss through accidents, and a fair allowance for feeding two or three months during the winter, it may be found by a simple computation that a good percentage could be obtained on capital invested in that way. As regards the four acres cultivated Mr. Buse informed me that he cleared as much cash by marketing the produce of his garden as he did from the butter. Good prices are realized for all garden produce, as the markets are not over-supplied with any of these things. The conclusion I reached in regard to this part of British Columbia is that the place is suitable for the maintenance of a sparse population, who, from the nature of the place, may become comparatively wealthy, through raising stock and making the best use of the land which may, through constant attention and perseverance, be irrigated. Those who had the first pick of the land were many of them able to attain this end at a trifling cost, and from the natural lay of the land are able to accomplish this, year by year, with but little labor. Those who come in later will find much greater obstacles to be overcome, and have not the advantages of the early settler.

Township 18, Range 16.

Some fine sections in this township at the north-east corner are composed of open country, scattered trees and clumps of timber over the prairie; the remainder of the township is thickly timbered with pine, fir, spruce, poplar and willow. The situation is in the mountains somewhat over 2,000 feet above the Thompson River, which is six miles to the north. Soil where observed is first-class, being a dark vegetable mould of great depth, but water is exceedingly scarce, and those who have tried to raise potatoes and other vegetables report their efforts a failure in consequence of frosty nights. Mr. L. Campbell had sown a field of barley as an experiment about the end of May, but a few weeks ago cattle had broken through the fences and destroyed most of the crop, yet on the 1st of September, that which was left was ripe, the heads were large, and grain of good quality. This crop had not been watered, the season being so dry the usual supply was not available. Mr. Campbell concluded from his experiment that by sowing at the proper time a large crop of barley could be grown as the soil for that kind of grain is all that could be desired. The land here is most valuable for grazing purposes, the grass both on the plains and in the woods being much more luxuriant than that on the open range at 1,000 and 1,500 feet lower altitude. There are several meadows in the township, for which applications have been entered, in some places by more than one party.

Township 18, Ranges 16 and 15.

In these townships the land is of the same character and suitable for stock ranges. Messrs. Campbell, Woodland, Buse, McGilvary, Senittoe, Ross, McGlachen, and Dupuis, have entered application to purchase or homestead lands suitable for meadow and pasture lands. In the mountain in Range 15, Campbell Creek takes its rise, and flows north-west until it enters the valley beforementioned. Several lakes are seen nestling among the hills which might supply water to a limited extent for irrigation if the climate would admit of raising crops. These lakes always supply the necessary water for stock, which is not as brackish as that in the ponds at a lower altitude, since there is always better water in the hills than on the flats which are drainage centres. Messrs. Woodland and McGee purpose breaking up several acres each this fall and putting in crop next spring. They think all kinds of grain for stock feeding can be grown successfully.

Township 19, Range 14.

Along the line of the Canadian Pacific Railway, six miles east of Mr. L. Campbell, is Mr. Duck, in Section 25. The first thing to attract a new comer into this locality, at this season, would be the large stacks of hay and grain which stand in the fields for a mile or two both ways from the station, and the green growth of clover which showed itself above the stubble in several of the fields. Mr. Duck has indeed a very valuable farm, which seems to be well managed, as the buildings, fences, and everything about the place give evidence of thrift. A photograph of the buildings was taken, showing the elevated flume by which water is conveyed to some of the fields in the foreground. Mr. Duck came to the country twenty years ago, and would therefore be considered one of the old timers, but in enterprise and progress he will certainly take a place in the foremost rank of successful farmers and business men. The stage road runs south-east from this point to Grand Prairie, and on to Okanagan Valley. The surface rises gradually about 1,000 feet in the first mile from the river and passes through timbered land, mostly pine and fir, the greater portion of which is large enough to manufacture into lumber. A large percentage of the township would be suitable to set apart as timber land, and from its locality and the position of the large hills which can be conveniently reached from the Okanagan Road, it would not be a difficult matter to convey the timber to the railway or the river. There is one settler residing on an unpatented lot in the middle of the woods, having selected this locality because of a swamp meadow containing some fifty acres, which supplies feed for his stock. Mr. Duck has a similar

meadow of large dimensions, which is situated on the waggon road, and is a patented lot, which, in this part, is considered valuable, because of its feed-producing capacity. Ordinarily there would be considerable feed all through the woods, but this season the greater part of the surface had been burned over, destroying the grass and small trees, but did not appear to have injured the large timber to any great extent. The waggon road is in first-class condition, and has been carefully selected and constructed. The construction of roads in this Province show a much more liberal expenditure of money for that purpose than the roads in the more wealthy Provinces of the east. The selection of the location shows good engineering, and the construction has been properly superintended. There are unavoidably long heavy hills, some of them 1,000 and 1,200 feet high, to be surmounted, and these will always render transport more expensive, mile for mile, than in more level countries.

The township is watered by Monte Creek, which enters the township in Section 4, and leaves it in Section 24. Along the north-east bank of the stream the waggon road is situated. The Thompson River also leaves the township in Section 25. Its course upwards is south east for a mile and a-half, and then towards the north-east, entering the township in Section 34. The land along the stream on the south side of the river for some distance belongs to Mr. Duck.

Township 18, Range 14

Is traversed by the Okanagan Road, which enters it in Section 2, and leaves it in Section 32. In Sections 3 and 10 is Summit Lake, said lake being two miles in length by about 30 chains in width, and bearing almost due north and south. The township contains a quantity of good merchantable timber, pine and fir, with some poplar in the valley of Monte Creek, which crosses the township in a north-westerly direction. Near the middle of the township one solitary settler resides on a patented lot, and in Section 21 is a marsh meadow, which belongs to Mr. Jacob Duck. A very small portion of the land is suitable for agricultural purposes. Quite an area might be cleared in the valley of the creek, and the land would be first-class, but the cost of clearing is a serious item, as the timber is dense and interspersed with almost impassable brush and scrub. Mr. Duck intends to make application to purchase several quarter sections along the valley of the stream and clear it for pasture land.

Township 17, Range 14.

The entire area of this township may be classed as mountain and bush. The Okanagan Road crosses in Sections 25 and 35, near the north-east corner. Near the south-west corner, Salmon River enters the township, and is crossed by the east boundary in Sections 24, 13 and 12. There are three settlers here who have taken up land along the stream, although it is heavily timbered by pine and fir of first-class quality. The best timber I have seen in this part I have found here, some of the trees measuring five feet in diameter. The timber, being so far from the railway, is looked upon as worthless by the people, and only in the way. I am informed that the cost of hauling lumber in from the railway, although only twenty-four miles by the road—which is a good road—is \$20 per thousand feet, and the cost at the railway is something over that amount, so that the people pay dearly for what ought to be procured at a small cost. The stream at this season runs, in many places, in an underground channel, and leaves the bed of the river to all appearances dry. In many places the channel is filled with floodwood, but by constructing dams and slides the timber could be floated down the river at high water. In the meantime the people are trying to destroy the timber by girdling the trees to kill them, so as to get them cleared out of the way. It would probably cost a large sum to improve the river so as to float the timber down to where it could be shipped; and parties undertaking such a work should receive all the assistance and encouragement possible to enable them to carry out the work to some pecuniary advantage. The soil in the valley is a sandy loam, and most of it could be irrigated in the spring of the year. The settlers having only recently moved in, have not cleared land to any great extent.

Township 17, Range 13

Extending across the township near its northerly boundary, from a mile to two miles in width, is the valley called Grand Prairie, which has been partly settled for upwards of ten years, and where grains of the usual kinds are grown successfully and heavy crops are obtained. The earlier settlers, as might be expected, have large farms which could not be purchased at a much cheaper rate than the same land would bring in the Province of Ontario. The valley is not a prairie proper, as only small patches are free from timber—pine and clumps of poplar being scattered here and there. The soil is a rich sandy loam, in places very deep. Towards the east side of the township the valley becomes marshy and filled with dense willows and black alders, until it merges into bush in the next township towards the east. Most of the people procure water for purposes of irrigation from Salmon River, but another stream known as Ingram's Creek comes in from the south and supplies the "Ingram Block," a farm of about 1,100 acres, with water. On this farm, quietly grazing among the bushes, may be seen a large camel, which is one of a number that were brought to the country some years ago to be used in packing, but at which they were not a success, their feet being too soft to stand the rocky roads of British Columbia, and the horses on the roads, not having seen such animals, took fright whenever met by them, so that it became necessary to prohibit their use altogether. Had these animals been adapted to the climate and rocky roads of the country they would have been a great boon because of the great loads they are capable of carrying.

Township 17, Range 12.

Is mostly timbered, except the rocky peaks of the mountains, which form a large percentage of the entire area. The township is crossed by the valley of Salmon River, near its north boundary, and the valley is traversed by the Okanagan road, which continues eastward along the stream to Okanagan and Spillamacheen. Three settlers reside near the road in the valley, who are clearing away the timber and trying to make a living. The place, on account of its proximity to Grand Prairie, is thought to be a desirable locality. Much of the timber is valuable, and might be floated down the Salmon River. In this part of the district people were much surprised to find their lands were in the railway belt, having been informed by the local agents that they were out of the belt. When the survey of the railway lands is completed, where settlements have made progress, many will be found within the twenty-mile limit who at present think they are far beyond it. In regard to the capabilities of the soil, I learned from a gentleman that in the vicinity of Grand Prairie one ton (33½ bushel-) per acre was considered an average crop of wheat, from a ton to a ton and a-half a fair yield of oats, and about 2,500 pounds an average yield of peas. Mr. Kirkpatrick informed me that he threshed seven and a-half tons of peas from six acres of ground, being forty-one and two-third bushels per acre. From the same authority I learned that thirty miles east in the Spillamacheen country the yield per acre is very much greater than at Grand Prairie, while the rainfall in that part is usually sufficient, dispensing with the necessity for irrigating the land. Roots of all the usual varieties are grown successfully. We obtained our supply of potatoes here at the rate of one cent per pound.

Having completed surveys enough at Grand Prairie to determine the position of settlers' improvements, I returned to Kamloops and proceeded westward to establish some points along the south shore of Kamloops Lake, and at other points from which applications had been sent.

Commencing in Township 20, Range 19, I started at the north-east corner of Section 17 which was established from the witness mark to the Canadian Pacific Railway station marked CCLIII. Running south from that point the country passed over, though hilly, is much more open than that to the east. This is the "park country" proper. There is some timber, but it is not of much account except for fuel, with the exception of that in the valleys, where good real timber is generally found. Mr. W. J. Roper has a large farm in Sections 17, 18, 7 and 8 of this town-

ship, lying in the Valley of Cherry Creek and watered by that stream. We had a treat in the shape of green fruit. Apples and pears of a very choice quality are grown in abundance and are sold at \$100 per ton. Mr. Roper would have twenty tons for sale which he could dispose of readily at the above figure. Pears, cherries, currants and other fruits brought good prices. While camped near Mr. Roper he was busy collecting the cattle and separating the calves from the other stock and branding them. The screeching of a hundred Red River carts would not be heard among three hundred cows when separated from their offspring, and the noise they keep up for several days before they leave in search of food. In Section 19 along the Canadian Pacific Railway, is a tunnel through a spur of Cherry Creek Mountain. Near the west end of the tunnel, a mining claim had been staked out last spring. The scenery at the tunnel is very fine; and half a mile to the west on the right bank of Cherry Creek, near its mouth, may be seen a terraced bank which looks like an old castle in ruins. The columns are of consolidated clay and gravel which have withstood the disintegrating processes of the atmosphere better than the surrounding material which has been worn away. About fifteen chains west from this interesting point is another one in Section 24, 20, 20, where Cherry Creek takes a leap from a precipice over a hundred feet in height. This will be an imposing sight in the spring when a large volume of water with dashing spray arches the chasm with rainbow tints, and treats to a shower bath any who approach to within a hundred feet of the basin at its foot. The Bishop of New Westminster has made application to purchase twenty-five acres of land taking in these objects of interest. The scenery is probably the principal inducement. The place would be suitable for a summer residence as the lake is at hand for boating and fishing. The north boundary of the township lies on the north side of Kamloops Lake.

Township 19, Range 19.

In this township there are three settlers, named respectively T. L. Hughes, George Pendleton and Edward James; the first named is living on a patented lot and the other two are squatters on Dominion lands which they desire to obtain as homesteads. Each of these follow farming on a small scale, while a limited number of stock is what they chiefly depend upon for a living. Cherry Creek and its tributaries are the sources of water supply—Mr. Hughes living on the main branch and the other two on tributaries. A large percentage of this township would be suitable for agricultural purposes if any means could be devised for irrigating the land.

A valley two miles wide, along which the Kamloops trail passes, crosses the township near its north boundary. The township entire is suitable for pasture land. There are several lakelets in the basins among the hills, but the water in these is strongly alkaline. Near the south-west corner of the township I observed some fences where Hull Brothers have pasture fenced in, but have not made application for the land in this part, so that it was not surveyed. Wherever water could be obtained all kinds of grain could be grown successfully, as the altitude is not so great as to render the climate unsuitable, and the patches which have been under cultivation produce good crops.

Township 20, Range 21

Lies mostly between Three Mile and Cherry Creeks, south of Kamloops Lake. There are three settlers residing in the township, viz., Patrick Duffy, Randall Young and Pierre Gantan, the first two being near the north-east corner and the other two at the extreme south-west. These parties are engaged in farming and raising stock. But a small percentage of the land is suitable for agricultural purposes, the greater portion of the township being rocky and mountainous, covered with scrubby pine and fir, which grow to a considerable size but are covered with branches and are consequently knotty. Bunch grass grows on the mountain sides and grasses grow in the ravines so that this is a favorable resort for stock in the fall of the year, when the more open plains are entirely destitute of feed.

Township 19, Range 21.

In Section 31 in the valley of Three Mile Creek, is the residence of Dominico Avostic, who selected this place because of its adaptability for wintering stock. He had made requisition to purchase about a thousand acres along the valley and up the mountain sides. In the valley along the west side of the creek is a pack trail leading to Mammoth Lake and the Nicola Valley. Some of the settlers have hay claims in the vicinity of Mammoth Lake which is thought to be somewhere near the limit of the railway belt and is in the mountain region. The season being so far advanced when in this locality there was not time to make a survey to those distant meadows.

Township 20, Range 24.

In Section 21 of this township is situated the village of Ashcroft, an important point from the fact of it being the supply station for all that north country opened up by the stage road to the Cariboo mining district. Here the Thompson River is spanned by an iron bridge resting on piers of concrete encased in iron tubes. At the mouth of the Bonaparte River which joins the Thompson, at a short distance off, is Mr. Harper's mill, where excellent flour is manufactured, the motive power being water from the Bonaparte. The surrounding country is exceedingly hilly and only a small percentage of the land fit for agriculture. South-west from Ashcroft, on a plateau about 500 feet above the river, a few hundred acres have been under crop, mostly timothy hay, irrigated by means of a long ditch from Barnes' Creek, a stream which originates in the mountains and is never dry. The soil is, for the greater part, a dark sand which, in many places, drifts like snow, yet it contains all the elements necessary to produce good crops of grain and roots—the only thing required to ensure a crop being a plentiful supply of water. Near the southern boundary of the township were posts which had been planted sometime during the summer to mark the limits of an Indian reserve. Irrigation ditches which are along the brow of the hill cause the land to break away and slide down toward the river. This is a constant source of trouble as well as danger to the railway.

When working here the ground became frozen so hard by the 19th November that work could not be carried on profitably, so I returned with my party and outfit to Kamloops; and after giving out my horses to winter and storing the outfit, I discharged all my party except two assistants whom I retained to assist me in re-establishing the traverse points along the Canadian Pacific Railway between Sicamouse and Griffin Lake, the marked telegraph posts having been removed by the railway company. I found the places from where the marked poles had been removed without difficulty, and planted posts marked as the poles had been, so that the notes and computations of last year will not have to be changed. In consequence of unfavorable weather I found this part of my work very disagreeable. There were about twelve inches of snow on the ground, and it rained continuously for ten days, at which time I completed the work and started for Gravenhurst on the 4th of December, reaching my home on the 9th.

I have the honor to be, Sir,

Your obedient servant,

THOMAS FAWCETT, D.T.S.

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

[PART II]

No. 11.

REPORT OF A. F. COTTON, D.L.S.

SUB-DIVISION SURVEY IN NEW WESTMINSTER DISTRICT, B.C.

OTTAWA, 27th January, 1887.

SIR,—I have the honor to submit the following report of my survey in the Province of British Columbia during the past season:—

I left Ottawa on the 28th April and arrived in Victoria on the 7th of May, having gone by the Northern Pacific.

My operations were confined to the New Westminster District. This district is the largest tract of first-class agricultural lands in the Province, extending from the Pacific Ocean over 100 miles inland, with the Fraser River running through it. It is nearly all bush land, although there are some patches of open prairie. On the rolling sections the timber is chiefly fir (red and white), cedar and hemlock, some of which grow to an enormous size, many being from 6 to 12 feet in diameter, and from 100 to 200 feet high. On the lower and level sections the timber is alder, soft maple, cedar, cottonwood, crabapple and vine maple, with a heavy growth of hazel, willow and rose bush. The soil is a very rich alluvial deposit, of great depth, capable of producing enormous yields of all kinds of grain, vegetables, and fruits.

There are several large settlements, which have their municipal councils, and schools, and the roads are a credit to them, many of them being much better than in some old settlements in Ontario.

Quite a number of settlers have gone in within the last two years, and those whom I met are well pleased with the prospects. The crops last season were excellent, and far exceeded the expectations of the new comers.

The climate is a most delightful one, resembling that of the South of England. The summer months are not excessively hot. There is little or no winter; all snow and ice disappears in February, when the rivers open up and spring begins. Such a climate must be a boon to farmers and stockmen, as they are not compelled to stable their stock for any great length of time.

The Fraser River is navigable for over 100 miles from its mouth; while ocean vessels ascend as far as New Westminster. The city of New Westminster is situated on the right bank of the Fraser, about fifteen miles from its mouth, and has a population of over 4,000. Several saw mills and canneries are established here, employing a great many hands. The city is now connected with the Canadian Pacific Railway by a branch line eight miles long, thus affording ample means of shipping both lumber and fish.

There are several streams running into the Fraser, the largest of which are the Pitt, Slave and Harrison on the north, the Salmon and Sumass on the south. All these streams abound with fish—trout, sturgeon and salmon. Many of the sturgeon weigh from 100 to 1,000 pounds. The most of these rivers run out of large lakes. The most noted is the Harrison, a beautiful sheet of clear water, about 40 miles long and from 1 to 4 miles wide. At the south end of this lake are the famous hot springs which bid fair to rival those at Banff. It is only five miles north of the Canadian Pacific Railway and is easily reached by a good waggon road which has been built from Aggasiz Station, and in the summer months by steamboat up the Harrison River. A first-class hotel has been built, the grounds nicely laid out and will, no doubt, be both a health and pleasure resort.

The cost of living is very little higher than in Eastern Canada; provisions, clothing and hardware are as cheap; house rent and wages are higher owing to the increased demand for both.

Below I give a description of the several townships surveyed by me.

I have the honor to be, Sir,

Your obedient servant,

A. F. COTTON, D.L.S.

E. DEVILLE, Esq.,
Surveyor General,
Ottawa.

Township 12.

The greater part of this township is gently rolling; timbered with fir, cedar and hemlock. There are numerous flats, with alder, maple and crab apple.

The Lillooet River runs through this township from east to west and joins the Pitt River. The Kanaka Creek also runs through this township. On this creek a small seam of coal has been discovered.

The north-west corner of this township forms part of the Pitt Meadows.

The soil is a very good dark sandy loam. Nearly all this township is taken up by squatters. This township forms part of the municipality of "Maple Ridge." Schools and post offices are established and roads built.

Township 15.

This township is hilly and broken on the east and rolling on the west. The Slave River runs diagonally through the south-east corner. It is a very rapid stream about ten miles long, running out of Slave Lake. The timber is chiefly fir, cedar and hemlock, with some maple, alder and cottonwood. The soil is a sandy loam. Quite a number of settlers have taken up claims in this township this season.

Township 20.

The Fraser River runs through this township. The south half is mountain, the north half is very level land, with some prairie in the north-west corner. The timber is willow, alder, cottonwood, crab apple with some dry cedar. The soil is a very rich alluvial deposit. It is flooded every year by the Fraser River and Nicosaamen Slough. A number of settlers have gone into this township, and are building dykes to protect their farms. A dyke 4 feet high is sufficient protection against any ordinary high water.

Township 27.

There is very little land north of the Fraser River in this township, that is fit for settlement, the most of it being mountain. That portion on the south side of the Fraser forms part of the municipality of Chilliwack. The timber is chiefly fir and cedar of fair size.

Township 3, Range 29, West of the 6th Initial Meridian.

This is only a fractional township, there being only two tiers of sections. The land is level and forms part of a valley that extends from the Fraser River to the Harrison Lake. The soil is a very good dark loam. The timber is alder, willow, crab apple and some fir. The road to the Harrison Lake Hot Springs, runs through this township.

Township 3, Range 28, West of the 6th Initial Meridian.

The greater part of this township that is fit for settlement is taken up by Provincial claims and Indian Reserves.

Township 4, Range 29, West of the 6th Initial Meridian.

There is only a portion of sections one and twelve that is level land. The remaining portion is lake and mountain. The hot springs are in section eleven. The Harrison Lake is about forty miles long and from one to four miles wide. There is some very good fir timber bordering the lake.

No. 12.

REPORT OF EDGAR BRAY, D.L.S.

SUB-DIVISION SURVEY IN LETHBRIDGE DISTRICT.

OAKVILLE, ONT., 12th January, 1887.

SIR—I have the honor to submit the following report on the traverse survey of parts of the Belly, Little Bow and St. Mary's Rivers, where these streams flow through or form the boundary of the North-West Coal and Navigation Company's land grant, and of certain sub-division surveys of the said company's lands, being Township 7, Range 20; easterly half of Township 6, Range 21; Township 6, Range 22; and Township 6, Range 23; and also the outlines of Township 4, Range 23; and a part of Township 5, Range 23, all west of the fourth initial meridian.

The traverse of Belly River was through Townships 10, in Ranges 18, 19 and 21, and Township 11, Range 18, and that of the Little Bow River through Townships 11, Ranges 18 and 19, and Township 13, Range 20. St. Mary's River was traversed where required to complete my sub-divisions, and also along the westerly half of Township 5, Range 23, previously mentioned.

I suppose a report accompanied the plans of the sub division of the townships on the Belly and Little Bow Rivers, and therefore I will only say that the land is open gently-rolling prairie, with good rich soil, except where it is broken by the banks of the river.

Belly River is from 6 to 12 chains in width, and flows through a valley which is nearly a mile in width and 200 feet in depth, with rough and frequently very steep banks.

Little Bow River is about 20 feet wide and has banks about 100 feet high. In other respects the surrounding country resembles that near Belly River.

With regard to the townships sub divided I have to say: 1st. Township 7, Range 20 is open prairie, slightly rolling along and near the northerly and southerly boundaries thereof, with a rougher tract passing through the centre in an easterly direction. The soil is mostly clay loam of excellent quality and good depth. Water was only found in very small quantities in the south-western corner of the township, but with an average rainfall I believe water would be plentiful.

2nd. Township 6, Range 21, is prairie, slightly rolling, with good rich soil. The easterly half, with the north and south boundaries only, was surveyed. No water was found in the surveyed part.

3rd. Township 6, Range 22, has the St. Mary's River for a part of its westerly and northerly boundaries, while Pot Hole River runs through the south-easterly corner thereof. St. Mary's River has rough banks, 100 to 150 feet high, with good bottom land in the valley. The upland is gently-rolling prairie with every indication of a fertile soil. Water was only found in the St. Mary's and Pot Hole Rivers.

4th. Township 6, Range 23, is only a fractional township, with St. Mary's River for its present westerly boundary. The land and soil has the same character as the township last described.

5th. Township 4, Range 23, has only the outlines surveyed. It is all good prairie land with the northerly half rolling and southerly half rough and hilly. Water can always be found in a stream which runs through the westerly sections of the township, and some swamps near the easterly and southerly boundaries can almost always be relied upon.

6th. By direction of the agent of the North-West Coal and Navigation Company I ran the eastern boundary of Section 4, Township 5, Range 23, and produced the same to St. Mary's River, and traversed the river to the west boundary of the

township, thus cutting off the westerly three sections. The land here is either rolling upland or river bottom, with good soil in both cases. Poplar and cottonwood timber in limited quantities grow in the valley of the Belly River, but not elsewhere within the limits of this survey.

Coal in workable seams and of excellent quality was noticed in many places along Belly River.

Having here so much good farming land, with good price for grain, it would be expected that grain growing would be followed as a business; such, however, is not the case as I did not notice any systematic attempt at cultivating the soil.

The chief purpose to which this land is applied, at present, is ranching; and I am informed, and believe, that this business promises to become very profitable. I can say that the land in this survey is well adapted for raising cattle, especially along the rivers, and also in Township 4, Range 23, as here water is always abundant, and shelter in winter easily found among the hills. As a matter of fact, about 3,000 head of horned cattle are now pastured along the Belly and Little Bow Rivers within the limits of this survey, and a herd of about 700 cows was seen near the westerly boundary of Township 4, Range 23. I was surprised to learn that these cattle do not receive extra care or feed in winter, except in cases of sickness or disability, but during the whole year live on the grass of the prairie. Horses or sheep will no doubt do equally well in this locality.

The weather was fairly good until about the middle of November, at which time the ground became frozen. On the 20th of that month six inches of snow was on the ground and the thermometer showed 21° below zero. A few days thereafter the weather became mild, the snow disappeared, and we had fine days with frosty nights for four weeks, though the ground remained frozen. On 20th December a couple of inches of snow fell, and the weather became cold again and continued very cold while I was in the country, which was until the end of the year.

I have the honor to be, Sir,

Your obedient servant,

EDGAR BRAY, *D. L. S.*

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

[PART II]

77

No. 13.

REPORT OF COL. ALEX. SPROAT, D.L.S.

CORRECTIONS TO SUB-DIVISION SURVEY NEAR CARLTON, SASK.

PRINCE ALBERT, 6th January, 1887.

SIR,—In accordance with instructions received from you in the month of February last, asking me to make a corrective survey of Townships 45, 46, 47, Range 4, and Townships 45, 46, 47 and 48, Range 5, west of the 3rd Principal Meridian, I have now the honor to report that on the 2nd day of March last I organized my party and proceeded to the performance of my duty.

I had not thought it was necessary (until the receipt of your telegram) that I should send in final report unless same was accompanied by my field notes and plans, on which I am at present engaged; indeed, it will be impossible for me, from the very nature of the survey, to make a report conveying more information than as to the amount of work done, general character of previous survey, and the character of the country.

The amount of work done consists of the resurvey of all of the above townships, covering a distance of 384 miles line survey, and 130 miles traverse of lakes. I was engaged at the work from the 2nd of March to the 27th of November, save twenty days at the beginning of July.

As regards the previous survey, I regret to say that I found it (excepting in Townships 45, Ranges 4 and 5) most inaccurate, and in some of the townships very little work had been done. I have completed the survey with the exception of the Indian boundary, about which I previously wrote to you. There are also several lines on which the posts will require to be mounded. This I could not do on account of hard frost setting in. I will see to this being done in the spring.

The country may be said, as a whole, to be rolling and broken, being high; hills crop up in many places, and there are innumerable numbers of lakes and lakelets, but the soil is generally of good quality.

The timber consists of poplar and willow, with small groves of pine around some of the lakes.

None of the timber is of any commercial value for lumbering purposes. I will endeavor to get my field notes in shape, and will send them to you as soon as possible.

I have the honor to be, Sir,

Your obedient servant,

A. SPROAT, D. L. S.

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 14.

REPORT OF R. C. McPHILLIPS, D.L.S.

SURVEY OF ROADS NEAR WINNIPEG, MAN.

WINNIPEG, MAN., 29th December, 1886.

SIR,—I have the honor to submit the following report of my work on the survey of trails in Manitoba during the season of 1886.

I received my instructions on the 26th of May and commenced work on the 8th of June, immediately on the arrival of the assistants who had been appointed to my party.

My work comprised the following trails, which for more convenient reference I have numbered as follows:—

1st. The trail from St. Boniface to Point de Chènes or St. Ann's.

2nd. The trail from St. Boniface on the east side of the Red River to Emerson.

3rd. The trail branching from the main road at the town of Morris, and running south westerly to the International Boundary, and generally known as the "Old St. Joe Trail."

4th. The trail which branches, in Township 5, Range 4 west, from the Headingly Road and runs north-easterly to the mouth of the La Salle River at St. Norbert.

Trails Nos. 1 and 3 are completed. No. 2 is completed as far as the rear line of the river lots in the Parish of St. Agathe, leaving a small portion between that point and the Town of Emerson which it was impossible to locate on account of the old trail being totally obliterated by cultivation, and not being shown on the plan of the river lots.

Of No. 4, only a part was completed, from its intersection with the rear line of the river lots of the Parish of St. Norbert to Section 14, Township 7, Range 1, west of the principal meridian.

The number of miles of road surveyed is as follows:—No. 1, 29.85 miles; No. 2, 67.55 miles; No. 3, 31.32 miles; No. 4, 16.75 miles, thus making a total of 145.47 miles, and for every mile of road surveyed there was at least one mile of section line to retrace and chain so as to enable me to make a proper connection with the township survey work. This part of the work was by far the most onerous, as all of the country through which these trails pass was surveyed prior to 1873, and the original posts had all been burned, and the mounds could not be found without running a trial line.

These trails were surveyed according to your instructions given me at the commencement and during the progress of the work.

Mounds similar to section mounds in the new system were built on each side of the road at every twenty chains, and at each change of course, making a total of about 1,100 mounds.

The field work was suspended and the party paid off on the 18th of December, the day following the receipt of your letter of the 13th December.

I have the honor to be, Sir,

Your obedient servant,

R. C. McPHILLIPS, D.L.S.

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 15.

REPORT OF JOHN McAREE, D.T.S.

SURVEY OF ROADS NEAR WINNIPEG, MANITOBA.

TORONTO, 31st Dec., 1886.

SIR,—I have the honor to submit the following report on my work of locating old trails in the Province of Manitoba during the past season, under instructions dated the 21st May, 1886.

On 12th June I arrived in Winnipeg, and proceeded to procure the prescribed outfit for the field. Some time was consumed in securing horses, as the prices asked were, in my opinion, generally very high. I at length secured the requisite number at moderate prices. I took the field on 18th June, beginning with the trail on the south side of the Assiniboine River. I began, according to instructions, on the westerly limit of the Parish of St. Boniface. This trail has been greatly improved, having been straightened and chopped out, and, in some places, graded and side ditches dug, making it, so far as our survey extended, a good summer road. On account of the dryness of the season the ground was too hard to drive posts into it without splitting them. We, therefore, used a wooden handspike with an iron shoe, steel pointed, to make holes to the depth of about twelve inches, into which the posts were inserted, and then driven home satisfactorily. It was not until after my return from this trail that I became aware that these road posts should have been mounded, or have been referred to bearing trees. But the posts set on this trail were, as a rule, set in brush where mounds could not have been made and where there were no trees large enough for bearing trees; and in the open places where mounds could have been made, they would have been speedily demolished and the pits obliterated by the numerous herds of cattle that frequent the locality. When we had proceeded 698 chains, and had arrived at Lot No. 14, Headingley, the settlers raised objections to the road being made one and a half chains in width, and so strongly did they insist on the point, that, to avoid any trouble, I considered it to be my duty to suspend operations until I could report to your office and obtain instructions in the matter. Accordingly I returned to Winnipeg, despatched a report of the case to Ottawa, and then proceeded with the survey of the trail from Kildonan to Stony Mountain. In reply to my report, you directed me to consult the Honorable the Minister of Public Works of Manitoba in this and all subsequent similar cases of difficulty that might arise. This instruction I had the honor to comply with, and he inclined to the opinion that in the case of the Assiniboine trail a width of one chain was sufficient; but he desired time to consider it.

On reporting the result of this interview to your office it was pointed out that by Act of Parliament the width of these old trails was fixed at one chain and fifty links. I had one or two further interviews with the Minister in Winnipeg in reference to the matter, but no definite conclusion was settled upon, and I did not get back to work on the Assiniboine trail.

I began the survey of the Kildonan and Stony Mountain trail at a point on the northerly limit of the road allowance of one chain established by the Municipality of Kildonan along the southerly limit of Lot No. 27, Parish of Kildonan, at a distance of about 47 chains from the highway, 2 chains wide, extending along Red River from Winnipeg to Selkirk. I made the terminus of the trail on the west limit of Section 2, Township 13, Range 2, east, at the distance of 13.47 chains from the north-west angle thereof, and about 11 chains from the railway station. I considered that the railway station might, most properly, be made the terminal point of the trail at this end. The total length of this trail as located by me is 824.06 chains.

It is entirely in its natural state; the southern portion is over flat prairie with occasional swamps, while the northern part is over higher prairie land with some flat places that would be pretty soft in a rainy season. My survey closely followed the cart track all the way, being, topographically, the best route that the ground afforded. The posts put in were iron of the kind prescribed by the Manual for section corners, and were all mounded. The letter "R" was stamped on them with a steel die. The mounding was, in many cases, a work of great labor in this naturally moist soil, which, owing to the great drouth, was now baked very hard, and was very difficult to cut with the spade. There is a good deal of traffic over this road.

Having completed the Kildonan and Stony Mountain trail, I commenced work on the trail running from Kildonan north-westerly to join the Winnipeg and Oak Point road in or near Township 14, Range 1, west. This was begun on the northerly limit of the road laid out by the Municipality of Kildonan along the southerly limit of Lot No. 27, Kildonan. Thence its course is for eight or nine miles, through an uninhabited country before reaching the settlements. Upon arriving at this point, in the work of location, I found that the settlers refused to allow the trail to be opened up through their farms. I was obliged therefore to proceed to Winnipeg and consult the Hon. the Minister of Public Works about it. He gave it as his opinion that this trail had now ceased to be necessary as a highway and recommended the abandonment of the survey. Upon reporting this to your office I was informed that I need not go on with the work, and I accordingly withdrew from it. It was while I was engaged on this trail that I had the honor to receive a communication from your office directing me to inspect and report upon the sub-division survey of Townships 11, 12 and 13, in Ranges 9 and 10 east, and Townships 11 and 12, in Range 11 east. I therefore returned to Winnipeg and proceeded on 17th July to Mr. James Ross, at Silver Heights, in whose charge I left the horses and carts and such parts of my outfit as would not be required on the present expedition, and that evening took the train for Monmouth in Township 12, Range 9, east. After completing the work of inspecting this survey, I returned to Winnipeg, which I reached on 29th July, and submitted a report to your office. I then resumed work on the trail north-westerly from Kildonan until I had to abandon it under the circumstances already detailed. From this trail I went to the east side of Red River, and, on the 10th August, proceeded with the survey of the trail from St. Boniface northwards to and beyond East Selkirk. The Municipality of Kildonan had already located a road in lieu of the old trail across their own territory; the municipal authorities of St. Paul also had caused a survey to be made of the trail across that parish; and the Provincial Government had continued the survey to Pruden's Bay, Lake Winnipeg. In making the actual survey of the road as it was, however, I found that, in numerous instances, it did not agree with the survey already made, as shown by the plans of the latter. The various Municipalities in improving the trail, in some cases followed the alignment given by the survey, and in other cases deviated from it, thus, practically, locating it for themselves. I took the road as I found it, thus adopting the alignment already made by the local authorities. In those cases where this differed from the alignment given by the surveys already referred to, it conformed more nearly to the old trail than the surveys did. This road is graded across the Municipality of Kildonan, that is, from St. Boniface to St. Paul, but beyond that the improvement occurs irregularly; at many points, however, the timber has been cleared off to a width of one chain, and, altogether, it is a very good summer road from St. Boniface to East Selkirk.

From the point where the trail crosses the southerly limit of Lot No. 80, St. Clements, being also the southerly limit of the corporation of East Selkirk, a road was run into East Selkirk. The old trail along this route has been disused for a number of years, but the East Selkirk people were very desirous that the franchise of this old trail should not be lost to their municipality, as it shortens the distance to their town by almost three-quarters of a mile. The opening of this route by a good road, including the construction of a bridge over Cook's Creek, had already been seriously contemplated by the East Selkirk authorities. A few iron posts were

used on this trail, until the receipt of a despatch from your office, forbidding their use, except in mounds. Bearing trees to the posts were taken wherever practicable. It was not deemed expedient to make mounds in those cases, few in number, where they might have been made, as they would generally have been in a farmer's field, or out on the thoroughfare where they would have proved a nuisance until obliterated by the traffic. Moreover, the comparatively few instances where mounds might have been built occurred chiefly in Kildonan, where the right of way is now determined by the ditches and the graded roadbed.

I regret to report the loss of one of our horses by straying from camp on the 17th of August, while on the survey of this trail, although we used every effort to recover it. Fortunately the state of the roads, owing to a very dry season, was such that the work was not retarded by this mishap, the two remaining horses performing all the transport service that was required.

The total length of trail located from St. Boniface to East Selkirk is about 1,770 chains. Although this trail is very well travelled, yet, after leaving Kildonan, a good deal of cutting of brush and timber was involved in ranging out the lines, which frequently varied from the opening followed by the cart trail; the growth, too, of brush and young timber along the trail was very dense.

When I had located this trail about 100 chains beyond East Selkirk, I thought it prudent to take up the survey of the trail from St. Clements eastward, through Township 13, to the Broken Head River, before the rains set in, as the eastern portion of that trail was represented as being swampy. We started this survey on the west limit of Section 24, Township 13, Range 5, east, taking the more northerly of the two branches of this trail as being the one that is joined by the road from St. Peter's. My survey followed the cart track closely all the way, and I terminated the survey on the east limit of Section 7, Township 13, Range 8, east, within a few chains of the site of the old saw pits of the Hudson Bay Company on the Broken Head. These saw pits were, I believe, the original objective point of this trail. I was credibly informed by an old settler that the trail was extended to the eastward of this point only after the construction of the Canadian Pacific Railway was begun, and as this was subsequent to the year 1870, this new portion is not a highway under the Act governing the same.

The total number of chains located was 1,273.40. About two miles of the westerly end of the trail lies through an open country being prairie or meadow interspersed with patches of timber. About four miles at the east end also lies through a comparatively open country, being meadow or marsh land with clumps of willow and poplar. The remainder of the route lies through poplar woods. The westerly portion of this trail is used by the Indians from St. Peter's, who at certain seasons go out that way gathering wild plums and cranberries, hunting, &c. We were not able to connect our survey with every section line crossed by it, from the fact that many of these lines could not be discovered, except by a systematic resurvey, the expense of which I did not feel justified in incurring. In some cases forest and prairie fires have consumed the posts and all the axe-markings by which the lines might have been recognized. The number of connecting points discovered were, however, sufficient to check the accuracy of the work. A few iron posts, in mounds, were used on the westerly open portion of the trail.

Having completed the location of this trail as far as the Broken Head River, I returned to East Selkirk and resumed the survey of the trail along the east side of Red River through St. Peter's. I had located and cut out about 300 chains, and was about to make the measurements and put in the posts when Chief William Prince, of St. Peter's, came to me and forebade my proceeding with the work, alleging that the Dominion Government had no authority to make the survey without first consulting the Indians. As he was very much opposed to the survey, and, as there was enough work indicated in my general instructions to occupy me until the close of the season, I thought it was wiser for me to withdraw. I, accordingly, reported the matter to your office, and proceeded with the survey of the trail from St. Andrews south to Cook's Creek Settlement.

I began the survey of the Cook's Creek trail on the bank of Red River at the original post between Lots Nos. 223 and 224, and made the division line between these lots the centre line of the road until the outer limit of the "outer two miles" was reached; this was in every way more desirable than running it to any extent diagonally across the lots, and was permissible in this case, because the old trail, at least, was about equally divided between the two lots in question. About two miles out from Red River the trail, as now used, turns a little to the south to meet the Canadian Pacific Railway at one of the crossings, which, I understand, were established at regular intervals of half a mile; the consequence is that, since the construction of the railway, the trail has been deflected to the south, coming back to the old trail about 290 chains from Red River. For the first 210 chains or so out from Red River the trail lies through a flat country, being prairie or meadow, with extensive clumps of poplar and willow. It then traverses a spruce and tamarac wood, wet near the centre with spring water from the foot of the slope leading to the sandy tract that comes in beyond the spruce woods. The sandy tract is met at about 290 chains from Red River and extends for about 260 chains when it is succeeded by poplar woods that continue to the end. I terminated the trail at the south limit of Section 12, Township 12, Range 5, east, close to the settlements. My survey was through a wholly unsettled country. The total length of the survey is 828.30 chains. The ferry across the Red River at the westerly terminus of the trail was formerly a little further down stream, I believe, the trail coming to the bank further to the north also. For this reason I have continued the road directly to the bank instead of turning it to the south to follow the present track which, I believe, is of comparatively recent origin.

I had completed the survey of this trail on 6th November; on the 8th I came into Winnipeg, and on the 9th I disbanded my party. On the 10th I had disposed of all the Government property in my possession according to instructions received a short time previously. The horses and buckboard were disposed of by private sale, fetching a better price in this way than I was led to believe they would have brought if sold at public auction, as the rest of the outfit was.

I have the honor to be, Sir,

Your obedient servant.

JOHN McAREE, D. T.]S.,

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

[PART II]

83

No. 16.

REPORT OF J. I. DUFRESNE, D.T.S.

SURVEY OF ROADS NEAR PORTAGE LA PRAIRIE, MAN.

MONTMAGNY, 28th December, 1886.

SIR,—I have the honor to submit the following report on my traverse survey of several old trails in the Province of Manitoba:—

On the receipt of my instructions on the 28th of May last, I started for Winnipeg, where I arrived on the 3rd of June, having spent one day on business in Ottawa. I employed the 3rd and 4th of June in Winnipeg to prepare my outfit, every article of which had to be selected and bought, and on the 5th, everything being ready, I left Winnipeg with my party *en route* for Portage la Prairie. We travelled to that place in carts and buckboard in order to avoid the great expense that transportation by rail would have occasioned us, and reached it on the 8th.

Here I may say that I was not a little surprised at the compact settlement existing for eight or ten miles around this town; in fact, not only by the great number of houses and the general aspect of the land, but by the good taste and variety of architecture displayed in the construction of the buildings, one would have thought that he was travelling in some rich district of the older Provinces.

As a part of the work allotted to me I had the traverse and the laying out of three old trails which started from Portage la Prairie. On my arrival in this town I was informed that two of the trails in question were no more travelled for the first ten or twelve miles from the town, and that the said old trails were obstructed by fences, and generally ploughed across. I immediately made a report of this state of affairs to the Department, and accompanied it with an explanatory sketch.

On the 10th of June I began the survey of the old trail from Portage la Prairie along the western side of the Assiniboine River. No permanent marks being left to define the width and course of the trail within the limits of the town, single posts were planted. The City Council of Portage la Prairie will probably never consent to change the actual width of road, which is one chain. Outside of the town mounds were built or posts planted, and bearing trees determined.

For all the trails surveyed, the mounds or posts were placed in such a way that joining any two following marks on the same side of the road by a straight line determines the allowance of the road for that side.

I had requests from Mr. Ogletree, Indian agent at Portage la Prairie, and from Mr. McColl, Superintendent of Indian Agencies in Manitoba and the North-West, with regard to locating the trail through the Indian reserve in Township 10, Range 8, so as not to disturb the improvements and land under cultivation in the limits of the said reserve. I hope these gentlemen are satisfied with the actual location of the trail, as I did all that circumstances would allow me to do to please them.

The survey of the old trail through Totogan and along Lake Manitoba on the western side, was started from Section 28, in Township 13, Range 8. From that section to the town of Portage la Prairie, the road allowance along sections are the only ones travelled now, and are constantly being improved by the municipality. The surrounding population seem to have no real want of a more direct road, as the country is so very level and easily travelled that a few miles more or less is not considered.

The invariable answer given to my frequent enquiries as to whether they would like the old trail to Portage la Prairie reopened, was that if it could be reopened without interfering with so many people's farms, they should not dislike it, but they would never like to travel a road that would cause injury to so many parties.

The trail surveyed next was from Poplar Point to the shores of Lake Manitoba. The trail, which is actually known as being the old trail, was located. I established the starting from the railway crossing of the trail in Section 31, Township 12, Range 4. The survey of the above trails was completed on the 27th of September.

On the 28th we left Portage la Prairie for Calf Mountain, in Township 3, Range 7, and on Saturday, the 2nd of October, we were at our destination. Of this trail, which starts from Calf Mountain, I have surveyed only about seven and a-half miles, being from Calf Mountain to a point east of Manitou. With this exception, it is nearly everywhere else abandoned, and generally ploughed and fenced, and where travelled it is only for small distances, and never exceeding a mile, the travel being made on the road allowances. The cause of this is, that the municipality has never consented to vote money to improve the old trail, whereas it has caused bridges to be constructed on road allowances across small streams and coulees; consequently, the travel has taken the so improved roads.

In this part of the country, however, principally from Archibald to Swan Lake, if the old trail had remained open, it would have proved very advantageous, as the country is very hilly and broken, and the best selected place for a road to pass is undoubtedly by the old trail. I have, however, followed the instructions I had received from the Minister of Public Works for Manitoba, in not surveying the trail where abandoned.

Of the trail from Portage la Prairie to the old western boundary of Manitoba, in Township 11, Range 12, I have surveyed only the part which lies between the east boundary of Section 1, Township 12, Range 9, and of Section 25, Township 11, Range 10, which is the only portion now travelled.

On the 26th of October, my work being completed, I returned to Portage la Prairie, where I arrived on the night of the same day. On the 27th I made arrangements with Mr. McDonald, auctioneer in Portage la Prairie, for a clearing sale of my outfit. Saturday, the 30th, was the day chosen for the sale, which was announced in the best possible way, and the result was very satisfactory.

I left Portage la Prairie for the east the same day.

I have the honor to be, Sir,

Your obedient servant,

J. I. DUFRESNE, *D.T.S.*

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 17.

REPORT OF JOHN McLATCHIE, D.L.S.

SURVEY OF ROADS FROM GLADSTONE TO FORT ELLICE, MAN.

NEW EDINBURGH, 4th January, 1887.

SIR,—I have the honor to submit the following report of the survey of the northerly trail, made under instructions dated the 21st of May, 1886, from the east boundary of Township 15, Range 13, west of the Principal Meridian, to Fort Ellice.

I was requested by you to communicate with the Minister of Public Works for the Province of Manitoba with reference to any suggestions he had to make regarding the survey of this trail.

In consequence of his instructions the old trail was abandoned in Range 13, east of the Beautiful Plain Ridge, and the road surveyed only one chain north of the right of way of the Manitoba and North-Western Railway, taking that portion of the fourth correction line road allowance north of the railway right of way and such other portion required to make the road one chain wide from the adjoining lands in Sections 1, 2, 3 and 4, in Township 15, Range 13, until the deflection of the railway southward left the whole of the Fourth Correction Line road allowance, which was followed to the Beautiful Plain Ridge.

It was suggested that the southerly limit of the road should be laid out 33 feet north of the centre of the railway track, but as the railway company had already fenced about half of this portion of the road I made the southerly limit of the road coincide with the northerly limit of the railway right of way, being 50 feet from the centre of the track.

On the Beautiful Plain Ridge the old trail has also been abandoned, at the request of the owners of the land, and with the approval of the General Superintendent of the Manitoba and North-Western Railway. The road is laid out 1 chain and 50 links in width, 50 feet east of the centre of the railway track and adjoining the right of way until it intersects the old trail. In this way two crossings of the railway are avoided, at one of which a gravel pit is opened by the railway company. It also gives an outlet to the new road made between the north and south halves of the section east of and opposite to Arden Station.

From the intersection of the old trail north of the railway the road is surveyed along it to the north boundary of Section 6, Township 15, Range 16, tying along the north boundary of Section 6 with the line between Ranges 16 and 17.

No bridges are built on any of the streams, nor have any improvements been made on this portion of the old trail for years past. The settlers west of the Beautiful Plain Ridge have for several years been opening out and improving the section roads in anticipation of having the old trail eventually closed up, and in consequence were generally averse to having this portion of it surveyed.

In many places the old trail has been ploughed up and fenced in, and in Section 10, Township 15, Range 16, a schoolhouse has been erected on it. It is stated that, in 1879, ten thousand cart loads of freight went westward on this trail, while at the present time hardly a load of freight passes over it in a year. The Canadian Pacific and Manitoba and North-Western Railways now control the carriage of freight westward. This portion of the trail is now used only by the settlers in going from house to house, or to connect with other roads leading to Arden, Neepawa and Minnedosa. The road from Arden to Minnedosa leaves the old trail in Section 22, Township 15, Range 14, and goes by way of the Neepawa railway station, and from there along the Fourth Correction Line road allowance to Minnedosa.

The old trail across Range 17 and the east half of Range 18 has been abandoned for several years, and as the settlers did not desire it to be opened again, in accordance with instructions of the 7th of August, 1886, I referred the matter to the Minister of Public Works for Manitoba, who instructed me not to survey it.

From the east boundary of Section 16, Township 15, Range 18 the road is surveyed along the old trail to the town of Birtle, which is situate on Section 6, Township 17, Range 26; excepting a portion of the north boundaries of Sections 17 and 18, Township 16, Range 23, which passes through Shoal Lake town site.

Between Minnedosa and Birtle, owing to the swampy nature of the country, it is actually necessary to keep the old trail open as a public road. The road, as now travelled, however, deviates in many places from the old trail. This is particularly the case in Township 15, Range 20, where the old trail is followed about one and a-half miles only. By deviating from the old trail in this township and in various other places, the road could have been improved, but I was instructed by the Minister of Public Works for Manitoba not to do so, as the Local Government had no desire to become responsible for the right of way.

The road survey is tied to the east boundary of Section 6, Township 17, Range 26, and measured across that section on the main street of Birtle to the line between Ranges 26 and 27. The survey is then continued along the old trail to the east boundary of Section 3, Township 17, Range 28. As the old trail has been abandoned between this point and Fort Ellice for several years, I was instructed by the Minister of Public Works for Manitoba not to survey it. I was also instructed not to survey a road to the new crossing at Fort Ellice, as it might interfere with the survey and arrangements made by the Council of the Municipality of Ellice.

At the request of some of the members of the Council of the Municipality of Ellice, I also surveyed the old trail from the westerly bank of Snake Creek to the crossing of the Assiniboine River, north of the mouth of the Qu'Appelle River. A portion of this old trail is not travelled at the present time, and therefore the survey does not cover the whole of the road required by the Council. The main object of the survey, however, is to procure, if possible, a road to the crossing of the Assiniboine River, which can be forded during the summer months, and on that account is much used by the settlers.

Observations were frequently taken to check the work as the survey progressed. Posts were planted and mounds built opposite each other in each limit of the road at every change of direction, and at such intermediate places as they were considered necessary.

The plans and field notes of survey are now in course of preparation.

I have the honor to be, Sir,

Your obedient servant,

JOHN McLATCHIE, D.L.S.

The Surveyor-General,
Ottawa.

[PART II]

87

No. 18.

REPORT OF T. D. GREEN, D.L.S.

SURVEY OF ROADS ALONG QU'APPELLE RIVER FROM FORT ELLICE TO LONG LAKE.

OTTAWA, 12th January, 1887.

SIR,—I have the honor to submit the following report of the surveys of trails according to my instructions, dated 21st May, 1886, and to subsequent advices received from the Lieutenant Governor of the North-West Territories.

On the 1st day of June I started for Winnipeg, where I purchased my supplies, and had them transported to Moosomin, a town on the Canadian Pacific Railway, where I completed the purchases for my outfit.

Some delay having occurred in forwarding my supplies, I was unable to leave Moosomin before the 12th day of June, and reached Fort Ellice on the evening of the same day.

While at Fort Ellice, in reply to certain requests made to the Lieutenant Governor of the North-West Territories, I was advised by His Honor to survey the trail from Fort Ellice to Moosomin, and connect my survey with Dominion Lands Surveyor Duberger's work of the season of 1885, and then to survey the old trail from Fort Ellice to Fort Qu'Appelle, south of the valley, crossing at Racette's Crossing in Section 18, Township 18, Range 9, west of the Second Initial Meridian, and continuing up the valley to Fort Qu'Appelle. Accordingly, after having completed the survey of the trail towards Fort Qu'Appelle across Township 17, Range 29, to the north-east corner of Section 1, Township 17, Range 30, west of the First Principal Meridian, I began the survey of the trail to Moosomin, and on the 8th day of July completed the work according to instructions.

On Monday, the 12th day of July, having returned to the Qu'Appelle trail, I continued the survey of the same from the north-east corner of Section 1, Township 17, Range 30, west of the First Principal Meridian. From the above section corner the trail runs in a south-westerly direction for about seventeen miles, when it diverts in Section 9, Township 16, Range 32, to the north-west for two and a half miles, and enters Township 16, Range 33, some sixteen chains south of the north-east corner of Section 13. For the next succeeding twenty-six miles the trail closely follows a westerly course till it crosses Section 26, Township 16, Range 4, west of the Second Meridian, when it turns towards the north-west and enters the Crooked Lake Indian Reserve, a few chains east of the quarter-section post on the north boundary of Section 31 of the last named township.

The trail follows this north-westerly course across Ranges 5 and 6 of the Indian Reserve and also Range 7, when it assumes a more westerly course, and enters the Valley of the Qu'Appelle River in Section 19, Township 18, Range 8. On entering the valley the trail continues its westerly course for about six miles, when it reaches the Post Office of Ellisboro', and again turns towards the north-west and crosses the Qu'Appelle River by a bridge in the N.E. $\frac{1}{4}$ Section 18, Township 18, Range 9, (formerly known as Racette's Crossing) and thus continues on the north side of said river, across Ranges 10, 11, 12 and 13 to Fort Qu'Appelle. Here I connected my survey with that of Dominion Land Surveyor Reid from Fort Qu'Appelle northwards.

From Fort Qu'Appelle, I followed my original instructions as the advice from the Lieutenant-Governor of the North-West Territories only instructed me how to proceed as far as that town.

Continuing the survey from Fort Qu'Appelle on the north side of the river, I traversed the trail across Township 21, Range 14, through Standing Buffalo's Indian Reserve and included the bridge crossing Jumping Creek. Twelve chains west of

Jumping Creek the trail turns to the north and ascends to the top of the high banks of the Qu'Appelle River, thus leaving the valley in Section 29 of the last named township by following up a coulée for a little over thirty chains, when it again resumes its close westerly course across Township 21, Ranges 15 and 16.

When near the completion of the survey of the trail across Township 21, Range 16, I received instructions from W. F. King, Acting Surveyor-General, to traverse that part of Jumping Creek which forms the western boundary of Standing Buffalo's Reserve.

Accordingly, on Friday, the 7th of October, I returned to the Qu'Appelle Valley at the mouth of Jumping Creek, and by the following Tuesday night the traverse was completed, and I was back to Township 21, Range 17, prepared to continue the survey of trail. I found, on resuming work, in the last named township, that the trail diverted towards the north-west, in order to obtain suitable approaches to the Valley of Loon Creek, which have been obtained in Sections 32 and 5, Townships 21 and 22, Range 17, west of the Second Meridian.

Leaving the valley of Loon Creek the trail proceeds on its westerly course through a level section of the country in Township 22, Range 18. The features of the country are undulating in Township 22, Range 19, and the trail becomes very crooked for nearly eight miles, when the surface of the country becomes more even and the trail more direct in its south-westerly course (across Townships 22 and 21, Range 20, and Townships 21 and 20, Range 21, west of the Second Meridian) crossing the marshy part of Long Lake in Section 32, Township 20, Range 21, at the old trail crossing. After crossing Long Lake, I continued the survey to the eastern boundary of Section 36, Township 20, Range 22, and closed the same by tying the work to the township corner of this section.

TABLE OF DISTANCES.

				Miles.
From Fort Ellice to	C. P. R. crossing at Moosonim -	-	-	26.6
do do	Ellisboro' P. O. -	-	-	92.3
do do	Kenlis do -	-	-	104.0
do do	Fort Qu'Appelle -	-	-	125.0
do do	Loon Creek P. O. -	-	-	151.4
do do	Longlaketon do -	-	-	174.2
do do	Crossing at Long Lake -	-	-	177.6

I have the honor to be, Sir,

Your obedient servant,

T. D. GREEN, *D.L.S.*

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 19.

REPORT OF J. L. REID, D.L.S.

SURVEY OF ROAD FROM QU'APPELLE TO PRINCE ALBERT.

PORT HOPE, ONT., 29th December, 1886.

SIR,—I have the honor to report that having, on the 26th of May last, received your instructions, dated the 22nd of the same month, to make a survey of the old trail from Troy to Prince Albert, beginning at Qu'Appelle, through Humboldt to the south branch of the Saskatchewan River, I left Port Hope on the 29th of May and arrived in Troy (Qu'Appelle Station) on the 3rd of June, remaining over one day in Winnipeg, to obtain camp outfit, &c. Having bought horses, carts, &c., at Qu'Appelle Station, I moved out to Fort Qu'Appelle and commenced the survey on the 9th of June from the north end of the bridge, where the Prince Albert trail crosses the Qu'Appelle River.

On the 10th of June I received your telegram instructing me to return to Qu'Appelle and make a survey of the old trail from thence to Fort Qu'Appelle. Having completed the survey of the former trail up through the gully to the top of the bank on the north side of the Qu'Appelle River on the 12th of June, I returned, on the 14th, to Qu'Appelle with the party, and on the 15th started the survey from where the old trail intersects the north boundary of the town plot of Qu'Appelle, and connected the said survey with the former starting point, viz., the north end of the bridge over Qu'Appelle River. On the 16th of June I received your telegram instructing me to follow the mail trail to Prince Albert, and not the south road as per original instructions. In compliance with the above, I surveyed the old trail through the Touchwood Hills, thence across the Salt Plain and past Humboldt and Mount Carmel. Wooden posts have been used on this survey, marked and mounded in accordance with your instructions of 2nd of June, 1886. Only in a few instances was it found necessary to deviate from the old trail for better ground, though in many places the distance has been shortened by straightening the road.

Owing to the numerous small lakes and pot holes intersecting the country through which the trail passes, considerable time was unavoidably lost in selecting the best location for the road. I may mention that I found it particularly difficult to pick up the lines or to find posts and mounds passing through the Touchwood Hills' Indian reserves, and also the settlement there. Both on the block outline and the sub-division surveys nearly all the mounds are destroyed and posts displaced.

On the 6th of November, finding that the ground was getting set in frost, I closed the survey for the season, being about twenty-four miles north-west of Humboldt, and having run about one hundred and sixty-two miles from Qu'Appelle Station.

On Monday, the 8th of November, I started with the party on the return to Qu'Appelle Station, where we arrived on the evening of the 17th of the month, and on the 18th I paid off the men there, and arrived in Winnipeg on the 20th.

In compliance with a telegram received from you at Qu'Appelle Station, I made arrangements with Mr. Caswell, of that place, to take the horses for the winter, also stored carts, buckboard and camp outfit with him, and took a receipt for the same, which you will please find attached.

The total cost of this survey, including making up plan and returns, &c., amount to \$3,424.08.

I have the honor to remain, Sir,

Your obedient servant,

J. LESLOCK REID, D.L.S.

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 20.

REPORT OF R. C. LAURIE, D.L.S.

SURVEY OF ROAD FROM SWIFT CURRENT TO BATTLEFORD.

BATTLEFORD, SAS., 4th January, 1887.

SIR,—I have the honor to report that, in accordance with your instructions of the 20th May, 1886, I surveyed the trail between Battleford and Swift Current, beginning work on the 26th June, and completing it on the 4th November, when I left for Battleford, arriving there on the 11th.

As decided by you, I adhered to the trail shown in yellow on the map sent me as far as the forks of the road shown on Section 17 on the plan of Township 25, Range 16. From this point I followed the fork to the east, as the other trail was entirely abandoned, there being no water between the spring known as the Horse-shoe Spring, on the north-west quarter of Section 36, Township 25, Range 17, and the South Saskatchewan, a distance of over forty miles. From enquiries made among the freighters, I found that the original trail had been abandoned within three months after it had been laid out, and the forks being marked on the township plan also showed me that it had been travelled previous to survey. I might state that the trail between Battleford and Swift Current was first marked out in the month of May, 1883, by Goodwin Marchand, for the Battleford merchants. It was what might be called a trial line, and has been altered from time to time as the country became better known. During the summer of 1884, the North-West Council employed the late Peter Ballendine, of this place, to locate, and mark at intervals, a shorter road. The principal change he made was south of the Sixty Mile Bush, about four and a-half miles beyond which he left the present trail and skirted the east of the Bad Hills, coming into the trail again opposite the mail station, about thirty-five miles north of the South Saskatchewan. Freighters who have followed this trail have informed me that they save a day by so doing, owing to the shorter distance and the easier grades. It had, however, to be abandoned the past season, owing to the scarcity of water. Last summer was exceptionally windy, and also very hot during the earlier months, which caused all the ponds to dry up, and nearly all the springs and lakes. The lake shown in the plan as White Bear Lake is almost dried up, there being no water visible from the trail. Where the road crosses the valley is shown on the township plan as water, but Laronde, who has been guide for the police for the past seven years, says that he has never known the trail to be covered with water beyond a little surface water during the thaw in the spring.

I might also state here, that although the alkali lake shown on the Sections 22 and 23, Township 26, Range 17, was perfectly dry this summer, there was no appearance of its ever having been within four or five chains of the trail, although the trail passes through what is shown as water on the plan. A new trail was made this year, branching off from the road I followed, on the north side of the valley of White Bear Lake, and crossing the flat considerably to the east, or much nearer the present lake, and coming into the trail again about four miles north of the river. By this a saving of about four miles is effected, and water is obtained fifteen miles from the river, while on the present trail there is no water—travellers having to go two miles to the east to a spring near the north-east corner of Section 5, Township 22, Range 15.

After crossing the river I followed the trail shown on the plan for about five miles, although it has been abandoned so long that in places it was obliterated. It ascends from the valley of the river by a steep hill, which is impassable to loaded teams, and up which even empty carts are taken with difficulty. This hill is on

the western side of an immense ravine, to go around which the trail has to diverge to the west, almost to the eastern boundary of Section 20, Township 19, Range 15. At the end of the first five miles the road is two miles west of the ferry, while the Swift Current Station lies eight miles to the east. Thinking that the trail was not a suitable one to establish, I ascertained the wishes of several of the settlers, and found that they, as well as the freighters, were in favor of the present travelled trail, rather than the abandoned one, but that some of them wanted the road located almost south from the ferry, and shown as ascending the ravine on Section 26.

This trail is at present used by light rigs, but cannot be travelled by freighters without being improved, and I was informed that sufficient money had at one time been subscribed to make the necessary improvements, but that they had not been made as the settlers were afraid their labor would be lost in the event of the trail being established elsewhere, and that doubtless the work would still be carried out if the trail were made permanent. I went to Regina, taking with me the plans of the various trails, and submitted them to the Lieutenant Governor of the North-West Territories, in accordance with my instructions, and was directed by His Honor to follow the generally travelled trail. While I was going to Regina the camp was moved to near the railroad, and on my return I surveyed northwards from Swift Current to the river.

The location could have been straightened in a number of places this year, but owing to the swamps having dried up, I was not certain whether a passable trail could be made in a wet season, and I thought it advisable to adhere to the old road. A noticeable example of this occurs in Township 24, Range 16, where the lake and swamps shown on Sections 23, 24, 25 and 26 are entirely dry; also those on Sections 1, 2, 10 and 11, Township 16, Range 14. At other places there appeared to have been soft alkaline spots, although at present they are quite firm.

I commenced the location from the south-west corner of Seventh street and Fourth Avenue west, south of Battle River, and followed the west side of the road allowance throughout.

At Swift Current I was unable to find any stakes marking the town lots, and the place in the possession of the agent for the sale of the lots had no bearings marked on it, consequently I was not able to close on to any of the streets which are surveyed parallel and perpendicular to the railway track. The course 377,378 of the survey follows the general direction of the foot of the hill to the north of the town, and must intersect one or more streets.

The total distance from Battleford to Swift Current by the located trail, is 183.85 miles. The distance from the post office, Battleford, to the starting point, is nearly 1.75 miles.

I plotted each day's work on a scale of 20 chains to 1 inch, and worked out latitude and departure tables for both the traverse and the location, which I checked together.

I also checked the bearings of the location and traverse together several times a day, where possible. I was unable at first to obtain a book of tables, and had to check the location by observations of Polaris, but afterwards I took an observation of the sun every clear day when locating.

I have the honor to be, Sir,

Your obedient servant,

R. C. LAURIE, D.L.S.

M. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 21.

REPORT OF C. A. BIGGER, D.L.S.

SURVEY OF ROAD FROM RED DEER RIVER TO FORT M'LEOD.

CALGARY, 2nd January, 1887.

SIR,—Your instructions directing me to survey and locate the Edmonton trail from Red Deer River to Calgary and thence to McLeod, and the trail from McLeod to Blackfoot Crossing, were received on 31st May. The work was commenced 16th June.

The trail from Red Deer River to Calgary was fully completed, the Calgary end of the line being connected with a previous survey made by Dominion Land Surveyor Bélanger.

From Calgary to Fish Creek the settlers have fenced the greater part of the old trail and left a road allowance, as a public highway.

Upon examining this road I found that it crossed a slough, which at certain seasons of the year would be impassable. The particulars were reported to the Lieutenant Governor, who granted a sum of money for repairing this slough—the expenditure to be supervised by the Calgary members for the North West Council.

The trail from Fish Creek to McLeod was fully completed early in November.

Additional instructions were then received directing me to make certain surveys on Mill Creek. This work was found to be somewhat tedious, on account of the roughness of the country and large tracts of dense willows and poplars. The work was completed 18th December. Very severe weather was experienced the following week, and the return trip to Calgary was attended by considerable hardship.

While encamped at McLeod, awaiting instructions, a blizzard commenced in the night and two ponies were lost. The storm lasted several days, and we were obliged to proceed without these horses. They were found by a half-breed and subsequently returned to us.

That part of the country in which our operations were carried on has been so often and well described by different surveyors that further comment is unnecessary.

I might, however, add that the development of this part of our great North-West has been even beyond the expectations of the most sanguine. From Calgary to Sheep Creek, well improved farms are seen in every direction, and the crops realized by the settlers are very encouraging.

South of Sheep Creek the country is more suitable for grazing, and large bands of cattle roam at large. Judging from their appearance I should say that the success of this industry is already assured.

I left my outfit with Mr. Lineham of Calgary.

I have the honor to be, Sir,

Your obedient servant,

C. A. BIGGER, D.L.S.

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 22.

REPORT OF GEO. P. ROY, D.L.S.

SURVEY OF ROAD FROM RED DEER RIVER TO EDMONTON.

QUEBEC, 29th December, 1886.

SIR,—In compliance with orders from your office, issued on the 20th of May last, I left Quebec in the beginning of June for the survey of that part of the trail between Calgary and Edmonton, situated north of the Red Deer River. I reached the crossing of this river on the 28th of the same month, having been delayed a few days in Winnipeg on account of the trains, and after remaining some time in Calgary to purchase the outfit and other things necessary for the work. One day was spent in making the preparations necessary to start the survey, and on the 30th the party was in the field.

The general direction of the trail was to be followed, and in fact it was found to run through that part of the country most suitable for such a trail.

In view of the great traffic and immense travel which some day may be done this way, my intention was to make the road as straight as the actual direction of the trail between the two extreme points, Red Deer and Edmonton, would allow, without neglecting the advantages of a hard bottom, easy grades and good drainage. I had also to consider the possibility of reducing the number of angles, and the fact that in many places the trail was lengthened by a curve around a soft spot, a small marsh or a bluff, any of which were of little consequence.

These obstacles my lines went through, for as long as the country is not settled the travel will run where it pleases, and after settlement farmers will improve the road to satisfy the public. However, except when of absolute necessity, all lines were avoided which would have caused any considerable amount of work to individuals, a little ditching, a small culvert, a slight cut, or a few branches thrown on a soft spot, being in most cases the only thing required to save a long turn of the road.

The country not being settled the public interests had no opposition, except in a case or two, of which I will speak later.

After tying my survey to Mr. Bigger's survey of the same trail, south of the Red Deer, and to the sub-division survey of Township 38, Range 28, I laid out the road along the north bank of the Red Deer, at a distance of about a thousand feet, so as to enclose on public ground the anchorage and landing of the ferry and the end of the ford crossing the river. The same thing was done at the other end of the work, on the south bank of the North Saskatchewan, the two extreme points being at a distance of 99 miles one from the other. I closed my work on the 14th base, tying to the post at the corner of Sections 31, 32, 33, 34, 35, 36, in Range 24, although the road was not laid out as far as that.

As already stated, the general direction of the trail as travelled was followed. However, in two or three cases, I left new branches of the trail to take the old ones. The first time was to save a long detour made to reach the bridge on Bigstone Creek, Township 47, Range 24, which has been built far away from the old trail with no apparent reason, the banks near the ford being as good as in any other place. The loss will not be very great, this bridge being in a dangerous condition.

The same thing happened at White Mud Creek; a bridge was built far away from the travelled road, probably on account of the higher banks of the river at this point, thus making it safe against a flood. It would take a large sum of money to make a good road two miles long to this bridge, and if the creek changed its bed the approaches would be flooded just as much as those of a new bridge at the old crossing

by which all the light travel now goes. In this case, as at Bigstone Creek, considering that it will take much less to build a new bridge than to build a new road, I followed the old trail which is the shortest and the best.

For the whole distance the trail is good, even as it now is, and it would require less work on those 99 miles of road to make a first class track than for 10 miles of a new road in this country. A few thousand dollars spent in the bad spots would make travelling over it fast and easy. I will direct your attention to a few places where immediate work would do good, especially in the spring.

A hill will have to be cut on the bank of the Red Deer, and in such a way as to allow the people who ford the river to use it as well as those who cross by the ferry. A mile further a small bridge or a 6 by 6 culvert, with filling on each side to shorten the hill, would be useful. Five miles from Red Deer the road crosses, at the head of two marshes, a small stream which connects both.

The ground being soft on each side of this passage for 100 feet would require to be planked with corduroy to make this spot good in all times of the year. In the spring loaded carts and waggons are liable to be mired in this place. Crossing the Blind Man River on the bridge, the road forks three miles above Baint's stopping place, which is situated 17 miles from Red Deer. The west branch of the fork turning off a mile runs through a rough country with a succession of steep hills and deep valleys, while the east branch follows the foot of the elevations and meets the other three miles further on. This road is level, the bottom fair, and much shorter than the other excepting that just before the two trails meet, at the end of a hog's back, between two sloughs, there is 50 feet of soft bottomless mud which swallows all the branches thrown into it and is bad all the year round. A good solid corduroy placed here would save the public a long curve and the dangers of steep hills and side inclines on a road which no improvement could make easy.

Next, at Wolf Creek, a ditch and corduroy for about 100 feet on the north side is required. After this, all the way up to Bear Hills, the trail is crossed by numerous streams from 1 to 10 feet wide, through which a waggon goes easily enough, although they make the road a little rough. But with the exception of two or three of the larger streams with banks, bridges, unless constantly attended to, would soon prove a detriment to the traffic, as ditches are cut at the end of these small bridges by constant use, and after a while these ditches become as wide as the creek itself.

The hills on each side of the Pipestone will have to be cut down. This has been partially done by Mr. Lucas, the Indian agent at Peace Hills, but they yet want considerable cutting before they are reduced to a proper grade.

After the crossing of the Bigstone, of which I have already spoken, the next obstacle is the Boggy Plain Creek, 10 feet wide and 1 foot deep, where a bridge is wanted. We then come to the White Mud River, after passing through a bush where the trail is not in the best of condition, but passable.

From White Mud to Edmonton my line for six miles goes through numerous bluffs of poplar, leaving the trail in many places where it makes a big curve to avoid a bluff or reach the head of small gullies running to the river. These I went through in some cases, as a little work would improve the trail sufficiently and save many angles. Five miles out of the bush takes us to the high and steep hills of the Saskatchewan. I followed the trail down these hills as it now is, hoping that the time will come when it will be improved to a moderate grade for a travelled road.

I will now refer to the private interests of settlers who are very few along the trail. The Battle River bridge, on Section 4, Township 43, Range 25, was built a mile and a half east of the old road, causing a change of trail extending from four miles south of the bridge to six miles above, the two trails meeting again on Section 35 of the same township, running through Chief Bobtail's Reserve. Mr. Aylwin, who keeps the Hollbrooke Post Office, is settled on the south-west quarter of Section 34, his house being built on the old trail. Running on the new one I struck the meridian between Sections 34 and 35, one and a half miles south of Mr. Aylwin's place, followed it for a distance, and then turned east again, meeting the abandoned trail half a mile north east of Mr. Aylwin. This gentleman wanted me to follow

the meridian bounding his place as far north as the old trail, and then take this one to the new road. The meridian properly worked and cleared would be better than the trail, as it is situated on higher ground, but from the meridian to the trail immediate work of a certain amount would have been required, and besides the road would have been longer; consequently, I mounded the trail from the bridge. However, after receiving orders to that effect, I submitted the case to His Honor the Lieutenant-Governor of the North West Territories, leaving it to him to decide finally. His decision I have not yet received. This is about all the trouble I had with settlers about my lines.

Although running through many reserves I suffered no inconvenience from the Indians. In a few instances my posts were pulled down and some mounds destroyed, but that was all.

Great difficulty was experienced in finding the section lines which my survey crossed, and in many cases hours were lost in finding the mounds, thereby causing long delays. However, on the 9th of October the survey was completed.

Without entering into a lengthy description, I may state that in general the road runs through a beautiful country, quite a change after the dreary horizon of the prairie. There is no monotony here, timber and water varying the view in all directions. Long rich grass covers a soil of the best quality in most cases, and large quantities of hay can be cropped along the sloughs, which abound everywhere. Game is plentiful. In fact, all taken together, this is the best part of the country I have yet seen.

Besides the survey of the road, I was instructed to survey the settlement on the east side of Beaver Lake, so that the lots should front on the lake, the improvements of one settler to be covered by one lot as far as possible. For this purpose I left Edmonton on the 11th of October, camping on the east side of the lake a few days after. The only settler I found there was an old hunter, a half breed, named Whitford. All the other settlers had been dispersed in all directions, and were waiting to return, as one whom I met accidentally told me, till they had enough money to restore their homes. Without giving unnecessary details, I will say that after examining the sub-division of the country made by Mr. Gosselin, D.L.S., and the location of the claims, very small interests, if any, conflicting, I concluded that no other sub-division could fulfil the purpose better than the one made, and consequently I did not care to alter in any way the regular survey. Moreover, all the settlers, of whom I met two, were, as I heard, satisfied with the work done, and will return soon to their claims.

After this I turned southwards, arriving at Calgary on the last day of October. I stored the outfit in that place, and left for the east on 3rd November, satisfied with a good summer's work, in a fair country and a fine climate.

Your most obedient servant,

GEO. P. ROY, *D.L.S.*

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

No. 23.

REPORT OF C. E. WOLFF, D.L.S.

SUB-DIVISION SURVEY AT PINCHER CREEK, ALBERTA.

OTTAWA, 29th November, 1886.

SIR,—I have the honor to submit the following report of sub-division survey in Townships 7, 8 and 9, in Range 1, west of fifth Initial Meridian, and 6 and 7 in Range 2, west.

Forming my party at Pincher, I, on the 5th of August, proceeded to work in Township 9, Range 1. On running the north boundary of the township from the north-west angle of Township 9, I struck 8.31 chains north of the township corner, on the fifth initial. Not being sure of where the error might be, I rechaind the meridian between Ranges 1 and 2, north from the third base, and found the distance and bearing all right. I then tied on to the township corner as I found it on the fifth initial. Later on, and under the enclosed instructions, I re-ran the north boundary of Township 9, on its correct azimuth.

Not finding the correction line, as laid down by D.L.S. Armstrong, anywhere near its correct position in either Ranges 1 or 2, I established the northern boundary of the correction line road allowance, across Ranges 1 and 2, in its proper place, and as per enclosed instructions closed on to posts on the correction established by me.

Finding that there were no iron bars or posts to be had at the depot at Medicine Hat (see enclosed statement), I have used wooden posts throughout my work.

I would here beg to suggest that wooden posts be used in this section of country, as they are less liable to be taken away. Mounds in the cattle districts are soon thrown down by the cattle. In some cases they follow right after the mound men, and destroy them as soon as built. The tins are then tramped out of shape, and one toss of the head sends the iron posts quite a distance off, to be lost in the grass. Besides this trouble, both white men and Indians often find a use for iron tubes. Wooden posts, although equally liable to be thrown from their position, being so much larger than iron ones, are easily found.

Many settlers from the American side of the boundary line have come in here during the past two years, preferring the climate and soil here to that in the States.

Owing to their temporary absence I did not get declarations from all the settlers.

I have watched certain portions of the southerly district of Alberta, and since the fall of 1882 I find that in many parts much travelled over by the cattle, the grasses are not nearly so abundant now as then. Then ranchers could cut all the hay they wanted within easy drawing distance of home. Now, I find that many of them have got to cut their hay many miles from where they wish it stacked. This decrease is not the result of over-stocking, but is greatly owing to the roots being killed by much cattle travel and by prairie fires. In wet seasons and on burnt prairie I think "Millet" and Alfalfa would take root by being merely scratched in. Many persons are opposed to the latter owing to its being so hard to get rid of or ploughed out, and also to a theory advanced that too much of it is weakening on horses. It certainly spreads rapidly—just what is wanted in that section of country—where there will be but few farms it can do but little harm, and when used along with the natural grasses of the country cannot be at all hurtful. Mr. John Herron, of Pincher Creek (late of the Township of Goulbourn in the County of Carleton), has tried it on a small scale, and informed me that he was sorry he had not started the growing of it sooner.

I have the honor to be, Sir,

Your obedient servant,

E. DEVILLE, Esq.,
Surveyor-General,
Ottawa.

C. E. WOLFF, D.L.S.

No. 24.

RULES AND REGULATIONS OF THE BOARD OF EXAMINERS FOR
DOMINION LAND SURVEYORS.

1st. Before each meeting the examination papers will be prepared by one of the members appointed by the Board for that purpose, and will be printed.

2nd. The examination sittings shall commence each day at 9.30 a.m., continue until 12.30 p.m., recommence at 1.30 p.m., and continue until 4.30 p.m., day by day, until completed.

3rd. There will be one separate set of questions for each sitting. All the papers will be collected at the close of each sitting, and candidates will be held to have failed in any not answered at that time.

4th. Any candidate obtaining assistance, during the hours of examination, by copying the papers of another candidate, or otherwise, will at once be dismissed, and any candidate who shall permit such copying or give such assistance, will be considered equally guilty and treated similarly.

5th. Each sheet of paper shall have at the top the subject and number of question and shall be signed and folded by the candidate, and endorsed with his name and the subject and number, and not more than one answer shall be written on the same sheet of paper.

6th. The candidate shall not write on one line more than one step in Geometrical or Algebraic work. A single step may cover several lines, but two or more should in no instance be put on the same line. They should be written thus :

Because $A = B$

And $B = C$

Therefore $A = C$

7th. No other person than the examiners and the candidates shall be admitted into the examination room.

8th. No books or diagrams of any kind, except those allowed by the Board, shall be brought into the examination room.

9th. Candidates are to present themselves punctually at the hours appointed for the commencement of the examinations, and no candidates will be allowed to enter the examination room later than fifteen minutes after that time, nor will any candidate be permitted to leave the room during a sitting, but so soon as he has finished his papers he may hand them to the examiner, after which he will not be allowed to re-enter until the next sitting.

10th. The examinations for Dominion Land Surveyor and Dominion Topographical Surveyor cannot be passed at the same meeting of the Board.

11th. A candidate rejected by the Board shall not be entitled to a new examination before the next regular meeting of the Board.

12th. Each candidate for "Full Examination for Admission as Surveyor" shall bring with him an instrument of the class mentioned in Section 83 of the Manual of Survey, which he shall submit to the Board for their examination and approval, and he shall also submit a plan and field notes of a survey, all made by himself, which will be filed with the papers in practical surveying.

13th. In examining the papers of candidates each answer, if perfectly correct, will be given the full number of marks allowed to it; if partly correct and partly wrong, such proportion of the total number of marks as the correct part of the answer bears to the whole question; and if entirely wrong, no marks; and no candidate will be admitted unless he has obtained the number of marks specified in the schedule A herewith. In orthography five marks will be deducted from the maximum number for every error, and one mark for every word short of 200 in the composition.

14th. The examiners will not communicate to any person the apparent or presumed results of the examination until the same have been officially announced.

15th. The Board has decided that none of its members shall take articulated pupils.

Special Examinations.

16th. Members of the Board holding local examinations under clause 88 of the Dominion Lands Act, sub-clause 5, will be furnished by the Secretary of the Board with the examination papers, and after completion of the examination under their supervision they shall return to the Secretary for the consideration of the Board the written answers of the candidates. The local examiner shall further examine all candidates passing the "Full Examination for Admission as Surveyor" in the use of instruments and practical surveying and the keeping and plotting of field notes, and shall also examine the instruments belonging to the candidates, and shall report to the Board on all these matters.

17th. Candidates who desire such special examinations will be required to pay to the credit of the Receiver General the fees of the Examiner, and also his travelling and living expenses when he is detailed specially for the purpose of holding the examination at a place other than that in which he usually resides.

The fees of the examiner are five dollars per diem. The preliminary examination takes four days, the full final examination six days, and the examination of Provincial Land Surveyors who desire to become Dominion Land Surveyors, two days.

The aforesaid amounts, as well as the fees provided by the Act, must be paid before the examination takes place.

When several candidates present themselves at the same time, the fees and the expenses of the examiner will be charged to them in equal proportions.

18th. When the Minister considers that owing to the number of candidates, it is expedient to hold a regular examination at some place other than Ottawa, and has the same advertised in the *Canada Gazette*, the candidates will not have to pay the fees or expenses of the examiner.

SCHEDULE A.

EXAMINATION FOR ARTICLES AS PUPIL.

	Maximum No. of Marks.
Penmanship - - - - -	50
Orthography - - - - -	200
Arithmetic and Logarithms - - - - -	100
Algebra - - - - -	100
Plane Geometry - - - - -	200
Plane Trigonometry - - - - -	100
Spherical Trigonometry - - - - -	100
Mensuration of Superficies - - - - -	100

No candidate will be admitted unless he obtains a total of at least 475 marks, including at least 150 marks for orthography, and 30 per cent. of the maximum number of marks for each of the other subjects.

FULL EXAMINATION FOR ADMISSION AS SURVEYOR.

	Marks.
Plane Geometry and Mensuration - - - - -	100
Solid Geometry - - - - -	150
Spherical Trigonometry - - - - -	150
Dividing and laying off of land - - - - -	100
Measurement of areas - - - - -	100
Descriptions for deeds - - - - -	100
Astronomy - - - - -	200
Practical Surveying - - - - -	200
Manual of Survey and Dominion Lands Act - - - - -	200

No candidate will be admitted unless he obtains a total of at least 650 marks, including at least 150 marks in Manual and Dominion Lands Act, and 30 per cent. of the maximum number of marks for each of the other subjects.

EXAMINATION UNDER CLAUSE 96 OF THE DOMINION LANDS ACT.

Candidates under Clause 96 of the Dominion Lands Act will be given the papers of the preliminary examination on penmanship, orthography and algebra, in addition to those of the full examination of Dominion Land Surveyors. For admission, they must obtain a total of at least 870 marks, including 150 marks for orthography, 150 marks for Manual and Dominion Lands Act, and at least 30 per cent. of the maximum number of marks for each of the other subjects.

LIMITED EXAMINATION OF PROVINCIAL LAND SURVEYOR FOR ADMISSION AS DOMINION LAND SURVEYOR.

Manual of Survey and Dominion Lands Act	-	-	Marks. 200
No candidate will be admitted unless he obtains at least 150 marks.			

EXAMINATION FOR DOMINION TOPOGRAPHICAL SURVEYOR.

Each paper contains more questions than required, from which the candidate will choose such as will make up the total number of marks allowed for the subject.

							Marks.
Algebra	-	-	-	-	-	-	50
Plane Trigonometry	-	-	-	-	-	-	50
Spherical Trigonometry	-	-	-	-	-	-	50
Plane Co-ordinate Geometry	-	-	-	-	-	-	80
Theory of limits, and sections of the spheroids	-	-	-	-	-	-	50
Differential Calculus	-	-	-	-	-	-	50
Geodetic surveying	-	-	-	-	-	-	150
Projections	-	-	-	-	-	-	100
Astronomy	-	-	-	-	-	-	250
Method of Least squares	-	-	-	-	-	-	80
System of Survey, track, micrometer surveys, &c.	-	-	-	-	-	-	150
Theory and use of instruments	-	-	-	-	-	-	150
Mineralogy and Geology	-	-	-	-	-	-	50
Trigonometrical Levelling	-	-	-	-	-	-	50
Magnetism	-	-	-	-	-	-	50

No candidate will be admitted unless he obtains a total of 850 marks.

By order of the Board of Examiners,

P. B. SYMES,
Secretary.

PROGRAMME OF THE SUBJECTS OF THE VARIOUS EXAMINATIONS IN SURVEYING.

The following programme has been prepared by order of the Board of Examiners of Dominion Land and Topographical Surveyors.

For the convenience of students the programme has been compiled in accordance with the text books mentioned below, but the candidates are at liberty to use any text book whatever, and any answer to the questions given will be accepted, provided that it is correct and practical.

LIST OF TEXT BOOKS.

Preliminary Examination—

Algebra—Todhunter's smaller Algebra.

Plane and Spherical Trigonometry—Snowball's or Todhunter's Plane and Spherical Trigonometry.

- Mensuration and Superfices—Chambers' Mathematics or Gillespie's Land Surveying.
- Dominion Land Surveyors' Examination—
- Plane Geometry and Mensuration—Legendre's Geometry or Todhunter's Euclid and Chambers' Mathematics.
- Solid Geometry and Spherical Trigonometry—Legendre's Geometry or Todhunter's Euclid and Todhunter's Spherical Trigonometry.
- Astronomy—Chauvenet's Spherical and Practical Astronomy.
- Measurement of areas and division of land—Gillespie's Land Surveying.
- Dominion Topographical Surveyors' Examination—
- Pure mathematics—Todhunter's larger Algebra, Todhunter's Plane and Spherical Trigonometry, Puckle's Conic Sections, Frost's Newton's Principia, Todhunter's Differential Calculus.
- Geodesy and Projections and Trigonometrical Levelling—Chambers' Mathematics, Lieut.-Col. Oliver's Practical Astronomy and Geodesy, Clarke's Geodesy (for reference).
- Astronomy—Chauvenet's Astronomy.
- Least squares—Chauvenet's Astronomy and Wright's Adjustment of Observations.
- Theory and use of instruments—Chauvenet's Astronomy and the "Instructions to Observers connected with the Meteorological Service of the Dominion of Canada."
- Mineralogy and Geology—Chapman's Mineralogy and Geology of Central Canada.
- Magnetism—Much information on this subject can be obtained from a good encyclopædia or preferably at a magnetic observatory.
- Todhunter's works, Snowball's Trigonometry, Puckle's Conic Sections and Clarke's Geodesy, are published by Macmillan & Co., of London, Eng. Chauvenet's Astronomy by Lippincott & Co., of Philadelphia, Wright's Adjustment of Observations by Van Nostrand & Co., New York; Chapman's Mineralogy and Geology and the "Instructions to Observers, &c.," by Copp, Clark & Co., Toronto.

PROGRAMME OF THE SUBJECTS OF THE EXAMINATION FOR ADMISSION AS ARTICLED PUPIL.

Penmanship and Orthography—

A subject will be given upon which the candidate is to write a composition of 200 words.

A loss of more than 50 marks will cause the rejection of the candidate. Candidates may write either in English or in French.

Arithmetic and Logarithms—

Addition, subtraction, multiplication and division. Greatest common measure and least common multiple.

Vulgar and decimal fractions.

Measures of length, capacity, area, weight and currency.

Square and cube root.

Use of Logarithmic tables. Mantissa and characteristic of logarithms.

Multiplication, division, involution and evolution by logarithms.

Algebra—

Addition.

Subtraction.

Multiplication.

Division.

Greatest common divisor.

Least common multiple.

Factoring.

Simplification of expressions.

Fractions—General principles.

Reduction of fractions.

Addition, subtraction, multiplication and division of fractions.

Equations of the first degree—Transformation and solution.

Simple equations of two unknown quantities.

Quadratic equations and equations solved like quadratics.

Problems depending for their solution upon Algebraic equations.

Plane Geometry—

Euclid's Elements, first four books, the sixth book and the definitions of the fifth, or Legendre's Geometry, first four books. Proofs of the Propositions.

Questions as to the Propositions, their practical applications, and the arithmetical or algebraic propositions corresponding to those propositions which relate to lengths of lines or areas.

Plane Trigonometry—

Measures of angles and arcs. The trigonometric ratios—Sine, tangent and secant. Fundamental formulas.

Signs of trigonometric lines.

Natural and trigonometric tables. Use of the tables.

Solution of plane right triangles—

1. Given the hypotenuse and one angle.
2. Given the hypotenuse and one side.
3. Given an angle and its adjacent side.
4. Given an angle and its opposite side.
5. Given the two sides.

Plane oblique triangles—Fundamental formulas—

1. Given two angles and one side.
2. Given two sides and an angle opposite one of them.
3. Given two sides and the included angle.
4. Given the three sides.

Problems depending for the solution upon Plane Trigonometry.

Spherical Trigonometry—

Fundamental formulas. Napier's analogies.

Solution of spherical right triangles—

1. Given the hypotenuse and one angle.
2. Given the hypotenuse and a side.
3. Given one angle and its opposite side.
4. Given one angle and its adjacent side.
5. Given the two sides.
6. Given the two angles.

Quadrantal triangles.

Spherical oblique triangles—

1. Given two sides and the included angle.
2. Given two angles and the included side.
3. Given two sides and an angle opposite one of them.
4. Given two angles and a side opposite one of them.
5. Given the three sides.
6. Given the three angles.

Problems depending for the solution upon Spherical Trigonometry.

Mensuration of Surfaces—

Areas of rectilinear figures, and of figures bounded by arcs of circles.

Areas of surfaces of right circular cones, circular cylinders, spheres, prisms, pyramids and parallelepipeda.

**PROGRAMME OF THE SUBJECTS OF THE FULL EXAMINATION
FOR DOMINION LAND SURVEYOR.**

Plane Geometry and Mensuration—

First four and sixth books of Euclid's Elements and the definitions of the fifth, or first four books of Legendre's Geometry.

Proofs of the propositions, and of deduced propositions.

Questions on the Propositions.

Mensuration of plain figures bounded by straight lines or circular arcs, and of the surfaces of solids, having either plane or spherical, conical or cylindrical boundaries.

Application of geometry to plotting, and to surveying without angular instruments.

Solid Geometry and Spherical Trigonometry.

Legendre's Geometry, or the eleventh book of Euclid's Elements. Definitions, proofs and applications of the propositions.

The volume of solid bodies bounded by plane, spherical, conical or cylindrical surfaces.

Great and small circles of the sphere.

Angles between great circles.

Propositions relating to the angles made by three or more planes passing through one point, and to the plane angles made by their lines of intersection.

Connection between these angles and the angles and sides of figures on a spherical surface, bounded by arcs of great circles.

General propositions relating to the angles and sides of spherical triangles—the polar triangle.

Proof of the fundamental formulae connecting the sides and angles of a spherical triangle.

Deduction of the formulae for the solution of right angled, quadrantal and oblique angled triangles.

The conditions of ambiguity of solution of spherical triangles.

Solution of given triangles and of problems depending for their solution upon Spherical Trigonometry.

Astronomy—

The celestial sphere—Spherical and rectangular co-ordinates.

First system—Altitude and azimuth.

Second system—Declination and hour angle.

Third system—Declination and right ascension.

Fourth system—Celestial Latitude and Longitude.

Co-ordinates of the observer's position.

Numerical expression of hour angles in time and arc.

Given the declination and hour angle of a star and the latitude, to find the zenith distance and azimuth of the star.

To find the hour angle, azimuth and zenith distance of a given star at its greatest elongation.

To find the hour angle, zenith distance and parallactic angle of a given star on the prime vertical of a given place.

Given the zenith distance of a known star at a given place, to find the star's hour angle, azimuth and parallactic angle.

Time; Sideréal and Solar day; Apparent and Mean solar time; astronomical and civil time.

To convert civil into astronomical time.

Time at different meridians.

Standard meridian time.

To convert the apparent time at a given meridian into the mean time or the mean into the apparent time.

To convert the mean solar time at a given meridian into the corresponding sidereal time.

To convert the sidereal time at a given meridian into the mean time at that meridian.

To find the hour angle of a star at a given time at a given meridian.

Given the hour angle of a star at a given meridian on a given day, to find the local mean time.

The Ephemeris or Nautical Almanac.

Simple Interpolation and Interpolation by second differences.

To find the Right Ascension and Declination of the sun at the time of its transit over a given meridian, and also the equation of time at the same instant.

Astronomical refraction, tables of refraction, variation of refraction, with the pressure and temperature of the atmosphere.

Corrections to be applied to the observed altitude of the sun, moon or a star.

Calculation of the latitude of a place from an observation of the meridian altitude of the sun or a star.

Calculation of the local time and the azimuth from an observed altitude of the sun or a star.

Calculation of the direction of the meridian from an observation on a circumpolar star at its greatest elongation from the meridian.

Candidates should be able to take these observations for time, latitude, and azimuth, practically, with an instrument, in the presence of the Board.

Measurement of Areas and Division of Land—

Text Book recommended—Gillespie's Land Surveying.

Division of land in the form of triangles, quadrilaterals, or other rectilinear figures into parts in a given ratio by straight lines drawn according to any given law.

Division of land of variable value.

Division of land by shortest possible line.

Rectification of boundaries; equalization of boundaries.

Measurement of areas by offsets from straight lines to a crooked or curved boundary.

Measurement of areas by division into triangles.

Measurement of the area included by a traverse, by means of latitudes and departures.

Balancing the traverse. Supplying lost distances and bearings.

Descriptions for Deeds, &c.—

Descriptions by metes and bounds.

Descriptions by sections or legal sub-divisions of the Dominion lands system.

Descriptions by lots.

Drawing up affidavits as to position of lost corners, &c.

Statutory declarations of settlers as to their occupation of the land.

Practical Surveying—

Each candidate is expected, at some time previous to his examination, to make a survey of a piece of land having not less than five sides, and containing water, hills, and other topography, and to furnish the Board at the time of his examination with his field notes of the same, neatly written, and a neat plan in colors drawn by himself.

These notes and the plan will be retained by the Board.

He is further expected to bring with him to the examination an instrument of the class mentioned in Section 83 of the Manual of Survey. The Board will examine him as to the adjustments and use of the instrument, as to his manner of keeping rough field notes, and as to his plotting of the same.

Manual of Survey and Dominion Lands Act—

The first part of the Manual of Survey of Dominion Lands.

Those parts of the Dominion Lands Act which relate to the re-establishment of lost corners and the division of regular and fractional sections, and to other matters connected with the practice of surveying.

PROGRAMME OF THE SUBJECTS OF THE EXAMINATION FOR COMMISSION AS DOMINION TOPOGRAPHICAL SURVEYOR.

Algebra—

Solution of equations of the first and second degree of one or more unknown quantities.

Inequalities.

Involution and Evolution.

Surds and Imaginary Quantities.

Proportion and Progression.

Binomial Theorem.

Permutations and Combinations.

Summation of Series.

Indeterminate Coefficients.

Reversion of Series.

Exponential Theorem, and series for the calculation of logarithms.

General properties of logarithms.

Probabilities—the fundamental theorems with application to solution of problems.

Plane Trigonometry—

Measures of angles and arcs. The trigonometric ratios. Sine, tangent and secant. Fundamental formulas.

Signs of trigonometric lines. Trigonometric functions of small arcs.

Inverse trigonometric functions.

Trigonometric tables, natural and logarithmic. Construction and use of the tables.

Transformation of trigonometrical expressions.

Solution of trigonometric equations.

Differences of the trigonometric functions.

Trigonometric series.

Developments of sines, cosines and tangents in terms of the arc.

Developments of \sin^{-1} , \cos^{-1} , \tan^{-1} in terms of the sine, cosine and tangent.

Determination of the ratio of the circumference to the diameter of a circle.

De Moivre's theorem. Exponential expression of the sine and cosine.

Solution by series of $\tan x = p \cdot \tan y$, and similar expressions.

Solution of certain triangles by means of series.

Measurement of heights and distances.

Spherical Trigonometry—

Fundamental formulas. Gauss' and Nadier's analogies. The polar triangle.

Solution of right angled, quadrantal and oblique angled spherical triangles.

Area of a spherical triangle. Spherical excess.

Formulas for the spherical excess of a triangle.

Deduction of the formulas for solution of a plane triangle from those for a spherical triangle.

Solution of certain triangles by means of series.

Applications of spherical trigonometry.

Analytical Geometry and Geometry of the Spheroid—

Rectangular co-ordinates; oblique axes; polar co-ordinates.

Equation of a point.

Distance of a point from the origin; distance between two points; division in a given ratio of the distance between two points.

Equation of a straight line; equation of a straight line passing through one and two points; other particular forms of the equation.

Angle between two straight lines; parallel lines; perpendicular lines; length of the perpendicular.

Transformation of co ordinates.

General equation of a circle; particular forms of the equation; tangent at and from a given point; normal at any point of a circle; pole and polar.

Intersection of two circumferences; radical axis.

Equation of the ellipse referred to its axes; tangent and normal; points where the tangent cuts the axes; length of the tangent; points where the normal cuts the axes; length of the normal; the foci and their properties; auxiliary or eccentric circles.

Conjugate diameters—their properties; equation of an ellipse referred to a pair of conjugate diameters.

Co-ordinates of a point on the ellipse in terms of the inclination to the major axis of the normal at the point; also in terms of the eccentric angle.

Radius and circle of curvature at any point of an ellipse; radius of curvature in terms of the inclination of the normal at the point; property of the common chords of a circle and ellipse; deduction of the length of the common chord of the ellipse and the circle of curvature.

Radius of curvature of the meridian of a spheroid, and of the section made by a plane, containing the normal to the surface and making any given angle with the meridian.

Radius of curvature of a section not containing the normal to the surface.

Lengths of axes and eccentricity of any section of a spheroid.

Theory of limits and differential calculus; definition of limits and limiting ratios; geometrical and analytical examples.

Summation of the area of the circle, ellipse and other figures by means of indefinitely small parallelograms or triangles; perimeters of curves.

Similarity of curves; centres of similitude.

Curvature, circle and centre of curvature.

Differential and differential coefficient; second and higher differential coefficients; geometrical interpretation.

Differentiation of functions; independent variable.

Taylor's and Maclaurin's Theorems.

Increments or decrements of the sides and angles of plane and spherical triangles.

Trigonometrical Surveying and Geodesy—

Signals—Tripods and scaffolds, reflectors, lamps, poles, underground and surface station marks.

Height of a signal for a given length of side over water or level land.

Characters of primary, secondary and tertiary triangulations.

Framework; traverses; composition of the series of triangles; single chain of triangles; double chain; hinged hexagons; quadrilaterals.

Base lines; subsidiary base lines; description of a base line apparatus; preparation of the line; monuments; alignment; adjustment of the apparatus.

Preliminary measurement; temperature of rods; inclination of rods; vertical offsets.

Distance across a creek or other obstacle; length of the line; reduction to a horizontal projection; reduction to sea level; broken bases.

- Measurement of base lines with a steel tape; measurement by sound; astronomical base lines.
- Measurement of horizontal angles; repetition and reiteration; comparison of the two methods; reduction of inclined angles to the horizontal plane; correction to an observed angle for inclination of the axis of the instrument.
- Measurement of the angles at a station; observations and records; auxiliary points determined with a concluded angle; reduction to centre of station; correction for phase and eccentricity of signal.
- Figure and dimensions of the earth; abnormal deviations of the plumb line; compression; eccentricity.
- Reduction of the latitude for the compression of the earth; development in series of the expression thereof.
- Radius of the terrestrial spheroid for a given latitude.
- Length of the normal terminating in the axis for a given latitude.
- Radius of curvature of the meridian for a given latitude.
- Radius of a parallel of latitude.
- Length of one second of meridian at a given latitude; length of one second of parallel.
- Area comprised between two meridians and two parallels (spherical solution).
- Reduction of a difference of latitude on the spheroid to the corresponding difference of latitude on the sphere, the radius of which is equal to the normal.
- Calculation of the triangles—Legendre's theorem. Spherical excess. Distribution of errors in one triangle.
- Calculation of the latitudes, longitudes and azimuths of the points of a triangulation, taking into account the ellipticity of the earth; Convergence of the meridians; Co-ordinates of the points of a triangulation referred to the meridian and a perpendicular to it.
- Spherical deduction of the three following formulas, using the sphere, the radius of which is equal to the normal and the difference of latitude reduced to that sphere.
- Given the latitudes and longitudes of two points, to find their distance and the azimuths of the line joining them.
- Given the latitude of two points and the azimuth from one point to another, to find their distance.
- Given the latitude of a point, the azimuth from this point to another and the difference of their longitudes, to find the distance between the two points.
- To find the offsets to a parallel of latitude.
- The geodetic line and the curve of alignment.
- Theory of Projections and Developments—**
- Projection of Maps—Plane, orthographic, globular, stereographic, gnomonic, conic, Mercator's, oblique cylindrical.
- Polyconic projection—Radius and length of the developed parallel; graphic construction of parallels and meridians; graphic solution of spherical triangles by means of the stereographic projection.
- Forms of great circles, lines of equal azimuth, &c., on the various projections.
- Astronomy—**
- The celestial sphere—Spherical and rectangular co-ordinates.
- First system—Altitude and azimuth.
- Second system—Declination and hour angle.
- Third system—Declination and right ascension.
- Fourth system—Celestial latitude and longitude.
- Co-ordinates of the observer's position.
- Numerical expression of hour angles in time and arc.

- Given the declination and hour angle of a star and the latitude, to find the zenith distance and azimuth of the star.
- To find the hour angle, azimuth and zenith distance of a given star at its greatest elongation.
- To find the hour angle, zenith distance and parallactic angle of a given star on the prime vertical of a given place.
- Given the zenith distance of a known star at a given place, to find the star's hour angle, azimuth and parallactic angle.
- Differential variations of co-ordinates.
- Time; use of the ephemeris; interpolation; star catalogues.
- Transit; sidereal and solar day; apparent and mean solar time; astronomical and civil time.
- To convert civil into astronomical time.
- Time at different meridians.
- To convert the apparent time at a given meridian into the mean time, or the mean into the apparent time.
- To convert the mean solar time at a given meridian into the corresponding sidereal time.
- To convert the sidereal time at a given meridian into the mean time at that meridian.
- To find the hour angle of a star at a given time at a given meridian.
- Given the hour angle of a star at a given meridian on a given day to find the local mean time.
- The Ephemeris or Nautical Almanac.
- Simple interpolation.
- To find the right ascension and declination of the sun at the time of its transit over a given meridian, and also the equation of time at the same instant.
- To find the local mean time of the moon's or a planet's transit over a given meridian.
- To find the moon or a planet's right ascension and declination at the time of transit over a given meridian.
- Interpolation by second differences.
- To find the Greenwich time corresponding to a given right ascension of the moon on a given day.
- Interpolation by differences of any order.
- Star Catalogues.
- Parallax. To find the equatorial horizontal parallax of a star at a given distance from the centre of the earth.
- To find the parallax in altitude or zenith distance, the earth being regarded as a sphere.
- General laws of refraction.
- Astronomical refraction; tables of refraction.
- Dip of the horizon.
- Semi-diameters of celestial bodies.
- Reduction of observed zenith distances to the centre of the earth.
- Finding the time by astronomical observations:—
- First method—By transits.
- Second method—By equal altitudes of a fixed star.
- To find the correction for small inequalities in the altitudes.
- Effect of errors in the latitude, declination and altitude upon the time found by equal altitudes.
- Third method—By a single altitude or zenith distance.
- Effect of errors in the data upon the time computed from an altitude.
- Time of rising and setting of stars.
- Finding the latitude by astronomical observations:—
- First method—By meridian altitudes or zenith distances.

- Meridian altitudes of a circumpolar star, observed both above and below the pole.
- Third method—By reduction to the meridian when the time is given. To reduce an altitude, observed at a given time, to the meridian.
- Circum-meridian altitudes.
- Effect of errors of time upon the latitude found by circum-meridian altitudes.
- Fourth method—By the pole star.
- Fifth method—By the transits of a star over the prime vertical.
- Sixth method—By difference of azimuths of circumpolar stars at their greatest elongations.
- Finding the longitude by astronomical observations:—
- First method—By portable chronometers. Chronometric expeditions between two points.
- Second method—By signals. Terrestrial and celestial signals.
- Third method—By the electric telegraph. Method of star signals.
- Fourth method—by moon culminations.
- Reduction of moon culminations by the hourly ephemeris.
- General description of the method of lunar distances.
- The meridian line and variation of the compass:—
- By the meridian passage of a star.
- By single altitudes.
- By equal altitudes of a star.
- By the angular distance of the sun from any terrestrial object.
- By the azimuth of a star at a given time.
- By the greatest elongation of a circumpolar star.
- General formulas of the transit instrument.
- To find the hour angle of a star on a given thread of the transit instrument in a given position of the rotation axis.
- The transit instrument in the meridian.
- Approximate adjustment in the meridian.
- Equations of the transit instrument in the meridian; thread intervals.
- Reduction to the middle thread.
- Reduction to the mean of the threads.
- The level constant.
- The collimation constant.
- The azimuth constant.
- Transits of the moon, the sun and the planets.
- Transits of the sun observed with a mean time chronometer.
- Meridian mark.
- Personal equation; personal scale.
- Determination of the geographical latitude by a transit instrument in the prime vertical.
- Approximate adjustment in the prime vertical.
- To find the latitude from the observed times of transit of a given star over a given thread east and west of the meridian, the rotation axis being in the same position at both observations.
- To find the latitude when the instrument is reversed between the east and west transits of the same star on the same night.
- To find the latitude from the observed transits of a star over the prime vertical east and west of the meridian, when the instrument is reversed at each transit between the observations of the star on opposite sides of the prime vertical (Strue's method).
- The altitude and azimuth instrument.
- The zenith telescope.
- Talcott's method of finding the latitude.
- The correction for level.

Reduction to the meridian.

Selection of stars.

To determine the value of a division of the level.

To find the value of a revolution of the micrometer.

Application of the portable transit instrument as a zenith telescope.

Method of Least Squares—

The most probable value of quantity determined by direct observations, of equal or unequal weights.

Probable and mean errors of an observation. Probable and mean errors of the mean of the observations. Mean of the errors. Definitions and formulae. Application of the formulae.

Probable error of the sum or difference of two quantities.

Indirect observations—Formation of simple equations of condition. Formation of the normal equations. Weighting the observations. Weights of the results. Mean and probable errors of the results.

Dominion Lands System of Survey—

Track, Micrometer and Exploratory Surveys.

That part of the Manual of Survey not included in the programme of Examination for Commission as Dominion Land Surveyor.

The construction and use of the tables contained in the Manual of Survey

To find from the tables the east and west width of any regular township at its north or south boundary, or at any other point of it.

To find the width of a broken township adjoining an initial meridian, or another system of survey.

To find the length of a jog on a correction line.

To find the length of the jog required in offsetting around a lake, &c.

Given the position of a point with reference to section, township and range, to find its latitude and longitude, and conversely.

Measurement of distances by the doubly-refracting prism micrometer, the divided object glass micrometer, stadia threads, movable thread micrometers, odometer.

Determination of the bearings of a traverse with solar compass, magnetic compass, box sextant.

Azimuth observations, and precautions necessary.

Method of making a rapid survey of a district by means of astronomical observations for latitude and longitude.

Theory and use of instruments—

Telescope—Magnifying power. The field of view.

Brightness of images produced by the telescope and the intensity of their light. Spherical and chromatic aberration. Achromatic eye pieces.

Diagonal eye pieces. To measure the magnifying power of a telescope.

Of the measurement of angles and arcs in general; Circles, Micrometer, Level, the vernier, the reading microscope, Error of runs, Eccentricity of graduated circles. To find the eccentricity.

The filar micrometer—To find the angular value of a revolution of the micrometer screw. The level.

Instruments for measuring time—Chronometers. Winding, Transporting; Correction for temperature; Comparison of chronometers; Comparison by coincident beats.

Clocks—The electro chronograph.

The sextant and other reflecting instruments.

Adjustment of the index glass.

Adjustment of the horizon glass.

Adjustment of the telescope.

The index correction.

To measure the angular distance of two objects with the sextant.

[PART II]

- To observe the altitude of a celestial body with the sextant and artificial horizon.
To measure an altitude of a celestial body from the sea horizon.
Method of observing equal altitudes with the sextant.
To examine the colored glasses.
The simple reflecting circle.
The repeating reflecting circle.
The prismatic reflecting circle and sextant.
Transit instrument.
Adjustment of the transit instrument. Inequality and irregularity of pivots.
Collimating eye piece.
Adjustments and method of use of the altitude and azimuth instrument and the zenith telescope.
General description of a mercurial thermometer
Calibration of the tube, mode of filling.
To graduate a thermometer according to Fahrenheit's scale.
Other thermometer scales; conversion from Fahrenheit's to centigrade and the converse.
Index corrections.
Distribution of heat by conduction, convection and radiation conductivity and radiating power.
Saturation defined.
General description of a mercurial barometer; measure of atmospheric pressure.
Capillarity in tubes of different diameters.
Correction for variations of the temperature of the mercury.
Corrections for latitude and altitude.
Mode of measuring the height of the mercurial column.
Correction for the expansion of the scale.
Correction for capacity; necessity for—how avoided.
Reduction to sea level.
Packing and carrying a barometer.
Defects to which barometers are liable—how remedied.
Aneroid barometers—mode of action and adjustment.
Spirit thermometers—their advantages and defects.
Maximum and minimum thermometers—mode of setting.
Precautions when reading a thermometer.
Mode of using thermometers to ascertain the temperature of the air.
Hygrometric observations—wet bulb thermometer.
Action of wet bulb thermometer and precautions relative to its use.
Relative humidity—dew point.
Rain gauge used at Canadian stations of the Meteorological Service.
Measurement of snow.
Direction and velocity of the wind.
Different kinds of vane apparatus in use.
Modes by which the direction of the vane is communicated to the recording apparatus.
Anemometers—description of the different kinds.
General considerations relating to the position and use of anemometers.
Registration of meteorological observations; description of the district, premises, instrument and its exposure.
Daily register; monthly, annual and secular abstracts.
- Mineralogy and Geology—**
Physical and chemical characters of minerals, particularly such as enter largely into the composition of rocks and minerals, known as ores or otherwise, of economic value.

Modes of determining minerals by the blow-pipe or by reference to their physical or elementary chemical characters.

Lithology. Composition and characters of the principal rocks, their modes of occurrence and origin. Alteration of rocks.

Condition, structure and arrangement of rock-masses.

Igneous rocks; distinction between plutonic and volcanic rocks.

Stratified rocks; distinction between those of mechanical, chemical and organic origin.

Folding and displacement of rocks; synclinals, anticlinals.

Faults; conformable and unconformable rocks.

Periods recognized in geological history.

Modes of determining the relative ages of formations.

Formations recognized in Canada, with their distribution.

Structure and occurrence of mineral veins and ore deposits.

Trigonometrical Levelling, &c.—

Trigonometrical levelling—by reciprocal zenith distances; by the zenith distance measured at one station; by the observed zenith distance of the sea horizon; by observed angles of elevation and depression; to determine the co-efficient of terrestrial refraction from reciprocal zenith distances; effect of plumb-line deviation on levelling operations.

Barometrical measurement of heights; precautions and corrections.

Measurement of heights by the temperature of boiling water.

General explanation of the use of the pendulum in determining the compression of the earth. Kater's reversible pendulum.

Magnetism—

General description of the instruments and methods used for magnetic observations, viz.:

Declinometer—measurement of the magnetic declination.

Dip circle—measurement of the magnetic inclination.

Magnetic force—horizontal intensity—oscillations.

Determination of the magnetic force by means of a deflecting magnet.

Correction to be applied to inclination and intensity observations when the instrument is not on the meridian.

Relations between observations taken with the instrument in two different vertical planes; determination of the inclination when the position of the magnetic meridian is not known.

General direction of the magnetic lines—of equal declination, inclination and intensity in Canada, with special reference to the North-West Territories.

BOARD OF EXAMINERS FOR DOMINION LAND SURVEYORS.

EXAMINATION PAPERS.

EXAMINATION FOR ADMISSION AS ARTICLED-PUPIL.

PENMANSHIP AND ORTHOGRAPHY.

Time, 3 Hours.

Composition, containing at least 200 words, either in French or English, on a given subject.

No. of
Marks.

Penman-
ship, 50,
Ortho-
graphy,
200.

ARITHMETIC AND LOGARITHMS.

*Time, 3 Hours.*No. of
Marks.

1. Find the square root of 12·7449. 8
2. Find the cube root of 1442·897. 9
3. Work out questions Nos. 1 and 2 by means of logarithms. 8
4. Find the value of $\sqrt[3]{37} - \sqrt[4]{12}$. 10
5. Reduce to vulgar fractions the following:

0 09375	5
0·0142857	5
3 10416	5
6. What fraction of a week is 0·145 of 31 days 10 hours 15 minutes? 10
7. The length of the arc of a semicircle is equal to the radius multiplied by 3·14159. Find the number of degrees, minutes and seconds in the angle subtended at the centre by an arc equal in length to the radius. 12
8. Find by the tables,

Log cos 17° 45' 13"·3.	4
Log tan 65 43 38	4
- Also find the angle whose tabular logarithmic secant is 10·7354809. 4
9. Find the square root of 3 to five places of decimals; from your result deduce the value of $\frac{2}{\sqrt{}}$ to the same number of decimal places. 16

ALGEBRA.

Time, 3 hours.

1. Simplify the following expressions:—

$$(a.) 5x - 3 [2x + 9y - 2 \{3x - 4(y - x)\}]$$

6

$$(b.) \frac{4x^3 - 17x + 12}{6x^2 - 17x + 12}$$

6

$$(c.) \frac{\frac{x}{a} + \frac{a}{x} - 2}{x - a} + \frac{\frac{x}{a} + \frac{a}{x} + 2}{x + a}$$

6

2. Reduce to its lowest terms—

$$\frac{33x^2 - 49x - 10}{21x^2 - 14x^2 - 29x - 10}$$

10

3. Find the L. C. M. of—

$$x^2 - 4, x^2 - 5x + 6, \text{ and } x^2 - 9.$$

8

4. Solve the equations—

$$(a.) \frac{1}{7} (3x - 4) + \frac{1}{3} (5x + 3) = 43 - 5x.$$

6

$$(b.) \sqrt{x - a} + \sqrt{x - b} = \sqrt{a - b}$$

7

$$(c.) \begin{cases} \frac{1}{y} + \frac{2}{x} = \frac{2x + 3}{xy} \\ \frac{1 - 2x^2}{x} = \frac{y}{x} - (1 + 2x) \end{cases}$$

8

$$(d.) \frac{x - 16}{x - 14} - \frac{x + 16}{x + 14} = \frac{x - 11}{x - 10} - \frac{x + 11}{x + 10}$$

8

$$(e.) \frac{x}{x + 1} + \frac{x}{x + 14} = 1.$$

8

5. The hands of a watch are at right angles to each other at 3 o'clock. Where are they next at right angles?

9

6. Find three numbers such that the second shall be two-thirds of the first, and the third half of the first, and that the sum of the squares of the numbers shall be 549.

9

7. Seven years ago A. was three times as old as B. was, and seven years hence A. will be twice as old as B. will be. Find their present ages.

9

100

GEOMETRY.	
<i>Time, 3 Hours.</i>	
	No. of Marks.
1. If a side of any triangle be produced, the exterior angle is equal to the two interior and opposite angles; and the three interior angles of every triangle are together equal to two right angles.	17
2. If the square described on one of the sides of a triangle be equal to the squares described on the other two sides of it, the angle contained by these two sides is a right angle.	17
3. If a straight line be divided into any two parts four times the rectangle contained by the whole line and one of the parts, together with the square on the other part, is equal to the square on the straight line which is made up of the whole and that part.	17
4. Express the last proposition in algebraic language. Also express in geometrical language the algebraic propositions. $(a+x)^2 = a^2 + 2ax + x^2.$ $(a-x)(a+x) + x^2 = a^2.$	17
5. The opposite angles of a quadrilateral figure inscribed in a circle, are together equal to two right angles.	17
6. Define the terms, Plane, Figure, Trapezium, Rectangle, the angle in a segment of a circle.	15

GEOMETRY.	
<i>Time, 3 Hours.</i>	
	No. of Marks.
7. To draw a straight line from a given point, either without or in the circumference, which shall touch a given circle.	17
8. To describe a circle about a given triangle.	17
9. To inscribe an equilateral and equiangular pentagon in a given circle.	17
10. Define the terms:— Ratio, proportion, proportionals, similar rectilineal figures, extreme and mean ratio.	15
11. If the vertical angle of a triangle be bisected by a straight line which also cuts the base, the segments of the base shall have the same ratio which the other sides of the triangle have to one another.	17
12. In a right angled triangle, if a perpendicular be drawn from the right angle to the base, the triangles on each side of it are similar to the whole triangle, and to one another.	17

PLANE TRIGONOMETRY.	
<i>Time, 3 Hours.</i>	
	No. of Marks.
1. Define the terms sine, tangent, secant, versed sine, complement, supplement.	6
2. Prove the formula $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$	17
3. The chord of an arc is 25.4 and the chord of half the arc is 15.3. Find the radius of the circle.	20
4. Given $a = 874.56$, $b = 859.56$, $C = 91^\circ 58' 10''$, to find A , B and c .	20
5. Given $a = 24804$, $b = 57876$, $c = 74412$, to find A , B and C .	20
Prove the formula $\tan \frac{1}{2}(A-B) = \frac{a-b}{a+b} \cot \frac{1}{2}C$.	17

SPHERICAL TRIGONOMETRY.

Time, 3 Hours.

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| | No. of
Marks. |
| 1. Give the rule for the solution of right angled spherical triangles by means of "Napier's Circular Parts." | 20 |
| 2. Give the formula for the solution of a spherical triangle when two sides and their included angle are given; also when two angles and their included side given. | 20 |
| 3. The three sides of a spherical triangle are $a=30^{\circ} 15'$, $b=42^{\circ} 37'$, $c=49^{\circ} 51'$, find the angles A , B and C . | 20 |
| 4. Given $C=90^{\circ}$, $a=1^{\circ} 21'$, $b=40^{\circ} 15'$, find the other parts. | 20 |
| 5. Prove that the sum of the sides of a spherical triangle is less than a great circle, and that the three angles are together greater than two, and less than six right angles. | 20 |

MENSURATION OF SUPERFICIES.

Time, 3 Hours.

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| | No. of
Marks. |
| 1. A plot of ground is in the form of a parallelogram, two of whose sides are 1245 and 864 links, and the contained angle is $65^{\circ} 40'$. Find the area in acres and decimals of an acre; also in acres, roods, and perches. | 17 |
| 2. What is the area of a triangular field whose sides are 1200, 1800 and 2400 links? Answer in acres, roods and perches. | 17 |
| 3. The parallel sides of a trapezium are 45 and 50 feet, and their perpendicular distance 25 feet. Required the area in square yards. | 17 |
| 4. Three equal circles touch one another externally. The area included between them is one acre. Find the radius of each of the circles. | 17 |
| 5. From the triangle in question 2, five acres are cut off by a line parallel to the side whose length is 2400 links. Where does this line cut the other sides? | 15 |
| 6. The radius of a circle is 10 feet. Find in square inches, the area contained between the circle and the regular hexagon inscribed within it. | 17 |

FULL EXAMINATION FOR ADMISSION AS SURVEYOR.

PLANE GEOMETRY AND MENSURATION.

Time, 3 Hours.

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| | No. of
Marks. |
| 1. The diameter AB of a circle is divided into any number of equal parts in points numbered 1, 2, 3, 4, 5, 6, &c. On $A1$, $A2$, $A3$, $A4$, &c., semicircles are described all lying on the same side of AB . On $B1$, $B2$, $B3$, $B4$, &c., semicircles are described lying on the other side of AB . Show that the circle is divided into figures all equal in area and perimeter. | 16 |
| 2. Given the area and perimeter of a rectangular field, find the length and breadth. | 16 |

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|--|----|
| 3. The length of a strip of land bounded on one side by a straight line is 84 chains, and its breadth at six equidistant points are 17.4, 20.6, 14.2, 16.5, 20.1 and 24.4 links respectively. At the extremities of the straight line the breadth is nothing. Find the area. | 17 |
| 4. On a common base equal to 30 feet, and on the same side of it are described segments of circles of heights 3 and 15 feet respectively. Find the area of the lune included between the segments. | 17 |
| 5. Describe a square that shall be equal to a given rectangle. Hence show that a square is greater than any rectangle having the same perimeter. | 17 |
| 6. If the vertical angle of a triangle be bisected by a straight line which likewise cuts the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the segments of the base, together with the square on the straight line which bisects the angle. | 17 |

SOLID GEOMETRY.

Time, 3 Hours.

1. Define the terms :—

Solid, pyramid, prism, cone, cylinder, parallelopiped, regular polyhedron, sphere.

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|---|----|
| 2. If two planes cut one another, their common section is a straight line. | 16 |
| 3. If two straight lines be at right angles to the same plane they shall be parallel to one another. | 20 |
| 4. If a solid angle be contained by three plane angles any two of them are together greater than the third. | 20 |
| 5. A piece of metal is in the form of a frustrum of a right cone. The diameters of the two ends are 4 and 10 inches, and the distance between the ends 8 inches. Find its weight, a cubic foot of the metal weighing 500 lbs. | 30 |
| 6. What is the solidity, and what is the surface of a sphere of radius 10? | 26 |
| 7. The section of a sphere by any plane is a circle. | 18 |

SPHERICAL TRIGONOMETRY.

Time, 3 Hours.

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|---|----|
| 1. The three angles of a spherical triangle are together greater than two and less than six right angles. | 12 |
| 2. What is meant by the polar triangle? What is the relation between the angles and sides of the polar and the primitive triangle? | 10 |
| 3. Two sides of a spherical triangle are together greater than the third, and the three sides are together less than four right angles. | 12 |
| 4. Give Napier's rules for the solution of right angled spherical triangles. | 12 |
| 5. The sides and angles of a spherical triangle are all equal. Find them. | 10 |
| 6. What is meant by the affections of the sides and angles of a spherical triangle? | 10 |
| 7. Given $A=80^\circ 40'$, $c=105^\circ 34'$, $C=90^\circ$. Solve the triangle. | 28 |
| 8. Given $a=70^\circ$, $b=38^\circ$, $c=40^\circ$. Find the angles. | 28 |
| 9. Given $A=128^\circ 45'$, $C=30^\circ 35'$, $a=68^\circ 50'$. Solve the triangle. | 28 |

[PART II]

DIVIDING AND LAYING OFF OF LAND.

*Time, 3 Hours.*No. of
Marks.

1. A polygonal field is divided into two parts by a crooked boundary, *A, B, C, D, E*. Show how to draw a straight line across the field dividing it into parts equal to the former. 15
2. A piece of land has an irregular frontage—such as a river bank. Its sides are parallel, and the rear line and side lines have given bearings. The width and the area of the lot are also given. Show how to find its depth from front to rear. 15
3. A parallelogram 7 chains in width, and containing 8 ac. 1 r. 24 p., is required to be divided among three persons, the first to have 2 ac. 1 r. 32 p., on the north end of the lot and the second to have 2 ac. 3 r. 25 p., being the south portion of the remainder of the lot. Required: The dimensions of the sub-divisions. 15
4. *A, B, C, D*, is a quadrilateral piece of land; the angles at *A* and *B* are right angles; the sides *AD* and *BC* are 40 chains and 30 chains respectively. The area of the whole figure is 175 acres. Required: The position and length of a line drawn parallel to *AD* and *BC* which shall divide it into two equal parts. 15
5. Divide a triangular field into three equal parts by straight lines drawn from a point within it to the angular points; also into three parts having any given ratio to one another. 20
6. The lengths of the North, East, South and West boundaries of a section (Dominion Lands) are respectively 78.50, 80.12, 80.29 and 80.10 chains. The North-Western angle of the section is 90° . Find the area of each of the quarter-sections. 20

MEASUREMENT OF AREAS.

*Time, 3 Hours.*No. of
Marks.

1. The following are the notes of a survey of a quadrilateral piece of land:

STATIONS.	BEARINGS.	DISTANCES.
1	N. 52° E.	10.63
2	S. $29\frac{3}{4}^\circ$ E.	4.10
3	S. $31\frac{1}{2}^\circ$ W.	7.69
4	N. 61° W.	7.13

Find the area by the method of Latitudes and Departures, first "balancing" the courses.

2. Show how to supply omissions in field notes such as those above when there are missing:
 - (a.) The bearing and length of any one side.
 - (b.) The length of a side and bearing of an adjacent side.
 - (c.) The length of a side and bearing of another not adjacent to it.
 - (d.) The bearings of two sides not adjacent.
3. When the length of one side is the only omission, how would you proceed to "balance" the latitudes and departures?

DESCRIPTIONS.		No of Marks.
Time, 3 Hours.		
1. Describe for a deed the following tract of land:—The initial point <i>A</i> is 23 chs. eastward from the N.W. corner of section 13, tp. 20, range 15, on the south side of the road allowance. The course of <i>AB</i> is S. 11°, 25' E., 7.34 chs., from <i>B</i> to <i>C</i> the distance is 8.40 chs., and the course S. 71° E., and the land between these two points is bounded by a curve determined by the following southerly right angled offsets; at 2c offset=47 links, at 4c offset=50 links, at 6c offset=51 links. From <i>C</i> to <i>D</i> the land is bounded by a creek, and from <i>D</i> to <i>A</i> the boundary is the south limit of the road allowance.	40	
2. A Dominion Land Surveyor wishing to obtain evidence as to the position in the original survey of the N.W. corner of a lot in the parish of Ste. Agathe, Manitoba, summons before him a settler who says that he has lived on the lot since 1870, that he saw the original post planted, that this post was afterwards destroyed, that he went to the place afterwards with two of his neighbors and finding the bottom of the post in the ground placed a stone above it, and afterwards laid the corner of his fence upon the stone. Draw up an affidavit for the settler's signature, testifying to these facts.	25	
3. The owner of a piece of land twelve chains square sells the east half of it, the division line intersecting the south boundary at $3\frac{1}{2}$ and the north boundary at $8\frac{1}{2}$ chains from the eastern boundary of the square. He reserves from the portion sold for the common use of himself and the purchaser a roadway 10 ft. wide along the division line. Draw up for a deed a description of the portion sold.	25	
4. Draw up a settler's statutory declaration of occupation.	10	

PRACTICAL ASTRONOMY.

PRACTICAL ASTRONOMY.		No. of Marks.
<i>Time, 3 Hours.</i>		
1. How is refraction allowed for in Astronomical Observations? How does it vary with the barometer and thermometer?		15
2. Define declination, right ascension, astronomical latitude, parallax, equation of time.		15
3. What is the difference between astronomical and civil time? Define sidereal, mean solar, apparent solar time. How are these different kinds of time changed one into another?		25
4. Explain the use of the artificial horizon in observation of altitudes. How can you observe the altitude of the pole star for latitude, with a transit theodolite, the level attached to the vertical circle of which has been broken?		15
5. Explain what is meant by greatest eastern or western elongation of a star. Describe the method of observing the greatest elongation of a star for azimuth in the night time. How would imperfect leveling of the instrument affect the result?		15
6. What is the best time of day for an observation of time by an altitude of the sun?		15

PRACTICAL ASTRONOMY.

*Time, 3 Hours.*No. of
Marks.

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|---|----|
| 7. An observation was taken at a place in longitude $119^{\circ} 20'$ W. of Greenwich on 16th August, 1881, at 7 h. 20 m. 15.3 s., sidereal time. Convert this into mean time, and also into apparent solar time; also find the civil time. | 15 |
| 8. At a place in latitude $50^{\circ} 33'$, longitude $106^{\circ} 37'$, on 20th March, 1880, the observed horizontal angle between Polaris at its greatest eastern elongation and a reference mark (to the west of the star), was $4^{\circ} 15' 30''$. What angle must be turned off from the mark in order to get the meridian? | 25 |
| 9. On the 13th July, 1881, at a place in longitude 105° W., the observed meridian altitude of the sun's lower limb was $59^{\circ} 12' 40''$. Find the latitude of the place. | 30 |
| 10. On 22nd September, 1880, in longitude 90° W., the observed altitude of α Persei was $40^{\circ} 20'$, the star being east of the meridian. The latitude of the place was $53^{\circ} 15'$. Find the sidereal time. | 30 |

PRACTICAL SURVEYING.

*Time, 3 Hours.*No. of
Marks.

- | | |
|---|----|
| 1. What is a vernier, and how is it read? | 7 |
| 2. How would you survey a road or river with many small irregularities? | 7 |
| 3. What objection is there to the use of a sextant for observing the angles of a traverse? | 7 |
| 4. What objection is the use of the compass? What advantages has it? | 7 |
| 5. How would you lay off with the chain alone an angle of 60° , or a right angle, and how measure with it any angle? | 8 |
| 6. What are the adjustments of the transit theodolite? | 10 |
| 7. From three points A, B, C , at known distances from each other in a horizontal straight line, the angles of elevation of the top of a tower, not in the straight line A, B, C , are observed. Show how to find by a graphical construction, or otherwise, the height of the tower. | 20 |
| 8. The point of intersection of two lines is inaccessible and invisible. How would you through a given point draw a straight line, which would if produced pass through their point of intersection? | 14 |

MANUAL OF SURVEY AND DOMINION LANDS ACT.

*Time, 3 Hours.*No. of
Marks.

(Candidates should be careful to answer the questions fully.)

- | | |
|---|----|
| 1. What are the widths of road allowances and where are they placed in the first, second, and third system of surveys, on the division line between two systems of survey and on the boundaries of Indian Reserves? | 20 |
| 2. What are the sizes of posts and mounds, and where are they placed? How are they placed as regards the cardinal points? Where are iron bars planted? Under what circumstances are no posts planted at corners? | 20 |

3. How would you mark the following posts:	
(a) At the N. E. corner of section 17, tp. 48, R. 3, West of the Principal Meridian.	
(b) At the easterly corner between tps. 9 & 10, Range 5, East of the Principal Meridian.	
(c) At the southerly corner between sections 5 and 6, tp. 19, Range 8, West of the 4th Initial Meridian (on a correction line).	
(d) At the North-East corner of section 9, tp. 19 A, Range 7, West of the 2nd Initial Meridian (on the south side of the road allowance dividing two systems of survey).	
(e) At the North-East corner of section 36, tp. 42, R. 13, West of the Third Initial Meridian (on a correction line).	20
4. What class of instrument is to be used in Dominion Land Surveys? What is the measure of length, and how tested? What precautions are to be taken to ensure that the measurements are faithfully performed?	15
5. Describe the process of sub-dividing a township. What traverses are to be made? How are these to be entered in the final returns? Of what do the final returns consist?	20
6. How are townships designated by numbers? How are sections in a township and the legal sub divisions of a section numbered?	10

MANUAL AND DOMINION LANDS ACT.

Time, 3 Hours.

(Candidates should be careful to answer the questions fully.)

	No of Marks.
7. How are legal sub-divisions to be surveyed? How are they surveyed in fractional sections? What do you understand by a fractional section? Suppose a section bounded on the west by an initial meridian, to have its north boundary 70·20 chains in length, and its south boundary 70·25; all the deficiency of these lines from 80 chains being left in the western quarter sections. How would you draw the division lines between the legal sub-divisions of this section?	20
8. How would you summon a person to give evidence before you as to the position of a corner or boundary? How would you proceed if he failed to appear before you at the time specified?	20
9. In re-establishing the northern outline of a township, the original posts on which have disappeared, what difference of procedure is there for townships surveyed under the old system and those under the new system of survey?	20
10. Describe a surveyor's final plan of sub-division of a township. What distances and what areas are to be written on it? What is the area of the roads in townships of the first and third systems of survey, respectively?	15
11. What is to be entered in the field book?	20

**LIMITED EXAMINATION OF PROVINCIAL LAND SURVEYOR FOR
ADMISSION AS DOMINION LAND SURVEYOR.**

(Number of marks for each question, 8.)

1. What are the dimensions and the areas of townships and what are the directions of their boundaries ?

1. Quelles sont les dimensions et surfaces des townships et quelles sont les directions des lignes qui les limitent ?

2. How are townships and sections numbered ? What are legal sub divisions and how are they numbered ?

2. Comment les townships et sections sont-ils numérotés ? Qu'appellez-vous subdivisions légales et comment sont elles numérotées ?

3. How many different systems of survey are there in Manitoba and the North-West Territory ? What are the differences between these systems ?

3. Combien existe-t-il de systèmes d'arpentage différents dans Manitoba et les Territoires du Nord-Ouest et quelles sont les différences entre ces systèmes ?

4. What parts of the country have been surveyed under the different systems of survey ? How is the line between two systems surveyed ? How is the gore between the regular townships of two systems designated ?

4. Quelles sont les parties du pays qui ont été arpentées suivant chacun des systèmes d'arpentage ? Comment doit-on arpenter la ligne entre deux systèmes d'arpentage ? Comment désigne-t-on le résidu entre les townships réguliers de deux systèmes différents ?

5. What are base lines and what are correction lines ? Why are they so called ? What are the numbers of the townships on each side of the fifth correction line, and of those on each side of the thirteenth base line ?

5. Qu'entend-on par lignes de base et lignes de correction ? Pourquoi les appelle-t-on ainsi ? Quels sont les numéros des townships de chaque côté de la cinquième ligne de correction et de chaque côté de la treizième ligne de base ?

6. What is a block and how is it surveyed into townships ? Where are the closing errors placed ?

6. Qu'est-ce qu'un bloc et comment le divise-t-on en townships ? Où laisse-t-on les erreurs de fermeture ?

7. How is a township sub-divided into sections ? What errors are allowed, and how are they disposed of ?

7. Comment divise-t-on un township en sections ? Quelles sont les erreurs permises et qu'en fait-on ?

8. How is a regular section divided into its legal subdivisions ?

8. Comment doit-on procéder pour diviser une section en subdivisions légales ?

9. How are measurements made ? How are obstacles to be passed ? What precautions are necessary ?

9. Comment fait-on les mesurages ? Comment doit-on passer les obstacles ? Quelles précautions sont nécessaires ?

10. When a trial line has been cut through woods, and posts have been offsetted from it, how is the true line to be marked ?

10. Quand une ligne d'épreuve a été tirée dans le bois, et que les poteaux sont déplacés et mis en dehors de la ligne, comment doit-on marquer la ligne véritable ?

11. Where are road allowances to be left, and what are their widths ? On which side of the road are the posts planted ?

11. Où doit-on laisser les réserves pour les chemins ? Quelles sont leurs largeurs ? De quel côté du chemin sont plantés les poteaux ?

12. What are the sizes of posts and mounds planted at township, section and quarter-section corners ?

12. Quelles sont les dimensions des poteaux et buttes au coin des townships, sections et quarts de section ?

13. Describe witness mounds and posts and bearing trees. Where are they used, and how are they marked ?

13. Décrivez les buttes et poteaux témoins, ainsi que les arbres de relèvement. Quand sont-ils employés et comment sont-ils marqués ?

14. Where are iron posts and where are wooden posts used ? In what cases are posts dispensed with altogether ?

14. Dans quels cas les poteaux de fer et les poteaux de bois sont-ils employés ? Quand peut-on se dispenser d'employer des poteaux ?

15. Give a full description of the field book and its contents.

15. Donnez une description complète du livre de notes et de son contenu.

16. How are road allowances shown in the field book ? How are traverses shown ? What measurements are to be entered in the field book ?

16. Comment sont indiquées les réserves pour les chemins dans le livre de notes ? Comment sont indiquées les lignes de relevés ? Quels sont les mesurages qui sont entrés dans le livre de notes ?

17. What are the lengths of the sides of the quarter sections adjacent to the north and south outlines of a township, and what angles do their eastern boundaries make with the township outlines ?

17. Quelles sont les longueurs des côtés des quarts de section adjacents aux limites nord et sud d'un township, et quels angles leurs limites méridiennes font-elles avec les lignes extérieures du township ?

18. What traverses are to be made ? How are they to be performed ?

18. Quels relevés doit-on faire ? Comment doit-on les faire ?

19. Of what do the final returns of a subdivision survey consist ?

19. Quels sont les documents à fournir après avoir terminé un arpentage de subdivision ?

20. How are the topographical features, and the bush, swamps, &c., to be shown on the plan ?

20. Comment les détails topographiques, bois, marais, etc., sont-ils indiqués sur le plan ?

21. What distances and areas are to be shown on the plan ?

21. Quelles distances et surface doit-on indiquer sur les plans ?

22. The posts on the boundaries of sections 1, 6, 31 and 36, surrounding a township corner, have all disappeared. How would you re-establish the lost corners, the townships having been surveyed under the first system of survey ?

22. Les poteaux sur les frontières des sections 1, 6, 31 et 36, autour d'un coin de township, ont tous disparu, comment rétablissez-vous les coins perdus, le township ayant été arpenté suivant le premier système d'arpentage ?

23. The posts on the boundaries of sections 31 and 36 adjacent to a correction line in the third system of survey, have all disappeared. How would you re-establish the lost corners ?

23. Les poteaux sur les frontières des sections 31 et 36, adjacentes à une ligne de correction, dans le troisième système d'arpentage, ont tous disparu ; comment les rétabliriez-vous ?

24. What is a fractional section ? How is it to be subdivided into its legal subdivisions ?

24. Qu'est-ce qu'une section fractionnaire ? Comment la subdivise-t-on en subdivisions légales ?

25. The north-eastern corner of a section and the quarter section corner on the north boundary of the section both lie in a lake. How should the section be divided into its legal subdivisions ?

25. Le coin nord-est d'une section et le coin du quart de section sur la frontière nord de la section sont tous les deux dans un lac ; comment doit-on diviser la section en subdivisions légales ?

EXAMINATION FOR DOMINION TOPOGRAPHICAL SURVEYOR.

ALGEBRA.

Time, 3 Hours.

(Maximum No. of Marks, 50.)

1. Solve the equations :

$$\frac{x-3}{4} - \frac{16+3x}{8+4x} = \frac{23}{14}$$

$$\left. \begin{aligned} x+y &= a \\ x^2+y^2 &= b \end{aligned} \right\}$$

2. What is meant by ratios of greater or less inequality? How are they respectively affected by addition or subtraction of the same quantity from each term of the ratio?
3. Obtain the formula for the summation of a series of terms in arithmetical progression.
4. Prove the rule for obtaining the value of a recurring decimal, viz. :—
 "From the given decimal subtract the non-recurring part. Write the difference as the numerator of a fraction whose denominator consists of as many nines as they are figures in the recurring part, followed by as many noughts as there are figures in the non-recurring part."
5. Find the coefficient of x in the tenth term of the expansion of $(1-2x)^{-3}$.
6. Write down the series for $\log(1+x)$ and $\log(1-x)$, and deduce a series for the practical calculation of logarithms.
7. If $y = a + bx + cx^2 + \&c.$ indefinitely, find x in terms of y .
8. Ten people sit down to a round table. Find the chance that any two given people sit together.
9. N points are connected in every possible way by straight lines. How many straight lines are there, if no three of the original points are in the same straight line, and how many intersections other than the original points have these lines?

No. of
Marks.

9

9

7

9

9

9

9

6

8

PLANE TRIGONOMETRY.

Time, 3 Hours.

(Maximum No. of Marks, 50.)

No. of
Marks.

1. Prove that
- $\frac{\sin a - \sin b}{\cos a + \cos b} = \tan \frac{1}{2}(a-b)$

6

2. Solve the equation
- $\sin 5x \cos 3x = \sin 9x \cos 7x$
- . Give the general solution. How many particular solutions has the equation?

9

3. By expansion of the expression
- $(\cos \theta + \sqrt{-1} \sin \theta)^n$
- find expressions for the sine and cosine of an angle in terms of its circular measure.

9

4. Express
- θ
- in terms of
- $\tan \theta$
- (Gregory's series), and show how this series may be used for calculating the value of
- π
- .

9

5. Given
- $\sin x = n \sin(x + \alpha)$
- , expand
- x
- in terms of
- n
- and
- α
- .

9

6. Sum the series—

$$\cos \alpha + \cos (\alpha + \beta) + \cos (\alpha + 2\beta) + \dots + \cos (\alpha + n-1\beta).$$

9

7. The angular elevation of a mountain peak is observed at each of two stations. The horizontal distance and the difference of level between the two stations are known. Also the horizontal angle at one station between the other station and the peak is observed. Show how, from these data, to find the distance of the mountain and its elevation above the stations.

12

8. Show that if θ be a small angle, $\log \theta = \log \sin \theta + \frac{1}{2} \log \sec. \theta$ approximately, and show how this may be used for obtaining the angle corresponding to the sine 7.9853647, using Chambers' Tables. Given $\text{Log} \sin 1'' = 4.6855749$.

12

SPHERICAL TRIGONOMETRY.

Time, 3 Hours.

(Maximum No. of Marks, 50.)

No. of
Marks.

1. From the fundamental formula

$$\cos a = \cos b \cos c + \sin b \sin c \cos A,$$

deduce the formula

$$\cos a \sin b = \sin a \cos b \cos C + \sin c \cos A$$

$$\sin a \sin B = \sin b \sin A$$

$$\cos \frac{1}{2} c \sin \frac{1}{2} (A + B) = \cos \frac{1}{2} C \cos \frac{1}{2} (a - b).$$

14

2. Find an expression for the radius of the small circle inscribed in a spherical triangle.

7

3. If E be the spherical excess of a triangle prove that

$$\sin \frac{1}{2} E = \frac{\sqrt{\sin S \sin (S-a) \sin (S-b) \sin (S-c)}}{2 \cos \frac{1}{2} a \cos \frac{1}{2} b \cos \frac{1}{2} c}.$$

12

4. State Legendre's theorem for the solution of a small spherical triangle as a plane triangle.

7

5. A triangle on the earth's surface has one side 15 miles in length; the angle opposite to it, as observed, is $55^\circ 15' 23''.5$. The other angles, as observed, are $65^\circ 34' 10''.3$, and $59^\circ 10' 30''.5$. The weights of these angular observations are as 2, 3 and 4. The spherical excess may be taken as $1''$ for a triangle having an area of 75 square miles. Find the corrected values of the angles and the area of the triangle.

18

6. The angle subtended by two objects having been observed, and also their angular elevations above the horizon, these elevations being small, find a series for the correction of the observed angle to obtain the horizontal angle between the objects.

17

PLANE COORDINATE GEOMETRY.

Time, 3 Hours.

(Maximum No. of Marks, 80.)

	No. of Marks.
1. Given the coordinates of two points, find the distance between them, and the coordinates of the point dividing this distance in a given ratio,	12
2. Obtain the equation of a straight line passing through a given point and making a given angle with the axis of x .	12
3. Find the angle between the two straight lines $5x + 3y = 8$ $3x + 4y = 7$	12
4. $Ax + By + C = 0$, and $A'x + B'y + C' = 0$; being two straight lines, what does $Ax + By + C + K(A'x + B'y + C') = 0$ represent?	12
5. What is the equation of the curve represented by $x^2 \left(\frac{\cos^2 \alpha}{a^2} + \frac{\sin^2 \alpha}{b^2} \right) + y^2 \left(\frac{\sin^2 \alpha}{a^2} + \frac{\cos^2 \alpha}{b^2} \right) - xy \sin 2\alpha \left(\frac{1}{a^2} - \frac{1}{b^2} \right) = 1$ <p>when the axes are turned through an angle α in the negative direction (the axes remaining rectangular)?</p>	12
6. Find the equation to the circle when the centre is at the origin, and when the origin is on the circumference, the axis of x passing through the centre.	12
7. Find the point at which the normal at a point of an ellipse meets the minor axis.	12
8. Find the lengths of the perpendiculars from the foci on any tangent of the ellipse and prove that their product is constant.	12
9. Obtain the polar equation of an ellipse, the focus being pole.	12
10. α being the eccentric angle of a point on an ellipse, find the coordinates of the extremities of the diameter conjugate to the diameter through the given point.	12

THEORY OF LIMITS AND SECTIONS OF THE SPHEROID.

Time, 3 Hours.

(Maximum number of marks, 50.)

	No. of Marks.
1. Define a limit and a limiting or ultimate ratio.	12
2. Find the limits of—	
$\frac{1^2+2^2+3^2+\dots\dots\dots+n^2}{n^4}$ when n is indefinitely increased.	
$\left(1+\frac{1}{n}\right)^n$ do do do	
$\frac{\sin x}{x}$ when x is indefinitely diminished.	12
3. Through two fixed points passes a circle of variable radius. From another fixed point in the production of the straight line joining the two former, is drawn a tangent to the circle. Find the limiting position of its point of contact when the radius of the circle is indefinitely increased.	15
4. Prove that if in two curvilinear figures there be inscribed two series of parallelograms, and if, when the breadths are diminished indefinitely, the ultimate ratios of the parallelograms in one figure to the parallelograms in the other be the same, each to each; then the two figures are to one another in that ratio. Employ this to find the area of an ellipse from that of the circumscribing circle.	18
5. Give the expression for the radii of curvature of the meridian and of the normal section perpendicular to the meridian at a point of a spheroid, the normal at this point making an angle ϕ with the plane of the equator. Also give in terms of these radii of curvature the radius of curvature of a section made by a vertical plane inclined at any given angle to the meridian.	18

DIFFERENTIAL CALCULUS.

Time, 3 Hours.

Maximum No. of Marks, 50.

1. Define the terms—differential co-efficient, second differential co-efficient, variable, constant, function, independent variable, and give geometrical illustrations.

12

2. Find the differential co-efficients with respect to x of xy , x^n , e , $\log x$, $\sin x$ and $\sin^{-1}x$.

15

3. Differentiate with respect to x

$$\left(\frac{x}{x + \sqrt{1-x^2}} \right)^n, \quad x + \log \cos \left(\frac{\pi}{4} - x \right)$$

$$e^x \times \frac{(x-2)e^x + x + 2}{(e^x - 1)^3}, \quad e^{(a+x)^2} \sin x$$

$$\log \frac{\sqrt{1+x} + \sqrt{1-x}}{\sqrt{1+x} - \sqrt{1-x}}, \quad \log (e^x + e^{-x})$$

18

4. If $y = a \cos (\log x) + b \sin (\log x)$, show that

$$x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} + y = 0.$$

15

5. State Taylor's and Maclaurin's theorems. Use the latter for expanding in terms of θ , $\sin \theta$ and $\tan^{-1} \theta$.

15

GEODETIC SURVEYING.

Time, 3 Hours.

Maximum No. of marks, 150.

	No. of Marks.
1. Indicate by a diagram the best method of "expanding" from a base to a side of one of the main chain of triangles of a trigonometrical survey, this side being, say, six times the length of the base.	30
2. Show how to reduce the measured length of the base to the sea level. Obtain the formula. Show that at an altitude of 2,500 feet the reduction is about 1 link to the mile.	30
3. How would you proceed when at one of the angles of a triangle you were unable to place your instrument exactly under the signal marking that station? What correction is necessary when the signal observed on is a tin cone illuminated by the sun?	30
4. Suppose a triangulation of a river, course nearly east and west, average length of sides of triangles 3 or 4 miles, and terminal points 150 miles apart. How would you obtain differences of latitude and longitude between the first and last stations, using the sphere most nearly coincident in curvature with the terrestrial surface along the line of triangulation? Deduce formula for working and illustrate by a rough diagram.	4
5. Given the latitudes and longitudes of two points, find the length and direction of the direct line connecting them (spheroidal solution).	45
6. If an abnormal deviation of the plumb line occurs at a station, amounting to 5", the plumb line deflecting to the west of the true vertical, what effect will it have on the azimuth of a line run on a bearing of N. 45° W., the said line passing over ground either level or rising or falling with a given grade?	45

PROJECTIONS.

Time, 3 Hours.

Maximum No. of marks, 100.

	No of Marks.
1. What is meant by the following terms:—Orthographic, stereographic, conic projection, Mercator's projection? To what kind of maps are these projections respectively suitable?	25
2. In the gnomonic projection, in which the projection is made on a tangent plane at the pole by lines drawn from the centre of the sphere, what does a great circle become in the projection? If its azimuth at a point of given latitude be given, what angle does its projection make with the meridian of the projection?	25
3. In the stereographic projection what is the projection of a great circle? How can the angles which great circles in this projection make with one another, and at the lengths of arcs, be measured? Show the application of this projection to the graphic solution of spherical triangles.	50
4. Describe the polyconic projection. For what kind of maps is it employed? What is the radius of a developed parallel of latitude? Show how to calculate the offsets necessary for laying down the meridians and parallels.	25
5. In Mercator's projection, what does a straight line represent? What would the straight line become were the projection changed to the gnomonic or globular?	25

[PART II]

129

ASTRONOMY—(1ST PAPER.)

Time, 3 Hours.

Maximum No. of Marks, 140.

No of
Marks.

- | | |
|---|----|
| 1. Describe the method of obtaining the moon's right ascension by moon culminating stars. How is the longitude obtained from this ? | 30 |
| 2. Find the effect of a given error of level in the axis of the instrument upon the time of transit of a star. | 30 |
| 3. Show how to find the latitude and the time by equal altitudes of the sun. What is the effect upon the result of errors in the data ? | 30 |
| 4. Deduce a formula for the determination of latitude by circum-meridian altitudes. | 30 |
| 5. Describe the method of observing latitude by prime-vertical transits. What effect has error of level of the axis ? | 30 |
| 6. What precautions are necessary in the determination of longitude by transport of chronometers ? Describe the method fully. | 30 |
| 7. Describe the method of obtaining longitude by electric telegraph—exchange of time signals. How are the time of passage of the electric current and the personal equation of the observers determined and corrected for ? What is the effect of varying strength of the telegraph battery ? | 30 |

ASTRONOMY (2nd paper.)

Time, 3 Hours.

Maximum No. of Marks, 110.

No. of
Marks.

- | | |
|---|----|
| 8. Distinguish between the brightness of the image of an object seen in a telescope and the intensity of its light. Why is a high power telescope used for observing stars in the day time, and a low power for searching for comets ? | 30 |
| 9. What are the necessary adjustments of the sextant, and how are they made ? | 30 |
| 10. In the use of the transit instrument in the meridian for the determination of time, how are the level, collimation and azimuth errors found allowed for ? How are the thread intervals determined ? How are inequality and irregularity of pivots found and allowed for ? | 30 |
| 11. How are the value of one division of micrometer screw and of one division of the level of the zenith telescope found ? | 30 |
| 12. Compare the use for latitude determination of the zenith telescope and of an instrument provided with an accurately graduated altitude circle for reading absolute altitudes. What are the relative advantages and disadvantages of the two instruments ? How do they compare with the transit instrument in the prime vertical ? | 30 |
| 13. How are the mean places of stars reduced to apparent places ? | 15 |

METHOD OF LEAST SQUARES.

Time, 3 Hours.

(Maximum No. of Marks, 80.)

	No. of Marks.
1. Give a definition of the probable error.	12
2. In a series of direct observations, distinguish between— probable error of an observation, mean do do probable error of the mean, mean do do mean of the errors, and give the formulas by which they are connected.	21
3. Give the formulas for the probable error of direct observations when they are of equal weight, and when of unequal weight.	18
4. Show how to solve simultaneous equations of condition more in number than the number of unknown quantities, in such a manner as to obtain the most probable values of the unknowns. What is the weight of the results?	21
5. A number of transit observations having been taken for time, the differences between observed time and right ascension are corrected for the observed level errors. Supposing the azimuth and collimation errors constant during the series of observations, indicate the manner of forming the equations of condition, preparatory to finding the chronometer correction, azimuth and collimation error.	24
6. At a trigonometrical point the successive angles, subtended by four surrounding points, were observed to be:— 65° 11' 52.500 with weight 3 66° 24' 15.553 do 3 87° 2' 24.703 do 3 141° 21' 21.757 do 1 Find the most probable values of these angles.	24

SYSTEM OF SURVEY, TRACK, MICROMETER SURVEYS, &c.

Time, 3 Hours.

(Maximum No. of Marks, 150.)

1. Find from the tables in the manual the theoretical widths of the north boundary of township 2 and the south boundary of township 3 in range 30 west of the Second Initial Meridian.	36
2. The latitude and longitude of a point are by observation $54^{\circ} 49' 10'' \cdot 3$ and $111^{\circ} 17' 23'' \cdot 5$. From this observation it is required to establish the section lines in the vicinity. Find what section, township and range the point is in, and what is the distance northerly and easterly to the boundaries of the section.	36
3. Each range of the old system of survey being 3 chains wider on a base line than the new, and the 8th base being 168 chains further north than the new 8th base, how much would the meridian between ranges 16 and 17 of the old system overlap the corresponding line of the new, on the 8th base? Give an approximate calculation.	38

	No. of Marks.
4. Suppose a rapid exploratory survey of a water system required using the following instruments—small sextant with artificial horizon, prismatic compass, micrometer telescope and pocket chronometer. How would you employ these instruments to obtain the best results in rapidity of work, and in consistency or equality of precision in applying them to obtaining the required traverse?	55
5. Give in detail the method you would prefer for obtaining, with above equipment, the astronomic azimuth of one of your lines, and the formulas you would use. What latitude observations would you think the best at your command for checking the positions given by your traverse? Under what conditions would these afford a check, of any value, on difference of longitude as well as difference of latitude obtained by your micrometer traverse?	60

THEORY AND USE OF INSTRUMENTS.

Time, 3 Hours.

(Maximum No. of Marks, 150.)

	No. of Marks.
1. How would you ascertain the circle reading for the horizontal point of the altitude circle of an altazimuth by means of an artificial horizon?	22
2. Give some methods of determining the magnifying power of a telescope.	22
3. Show how a portable transit instrument can be adapted for use as a zenith telescope. Show that an ordinary transit theodolite furnished with a good level may be used as a zenith telescope by observing transits over the diagonally placed threads in the focus.	23
4. In the Lugeol micrometer which has a divided object glass, at what point does the measurement obtained begin?	23
5. Describe the wet and dry bulb thermometer and the manner of using it.	22
6. How is the ordinary portable mercurial barometer (Fortin's) adjusted for use, and what effect would $\frac{1}{10}$ of an inch error in this adjustment have on the height of the column, if the diameter of the tube be $\frac{1}{2}$ inch and of the cistern 2 inches?	22
7. Describe the setting and reading of maximum and minimum thermometers.	23
8. What precautions should be observed in the hanging of thermometers? Where should a rain gauge be placed? How is the amount of snow fall determined?	23
9. Describe the construction and adjustment of the aneroid barometer.	22
10. What is the "error of rims" in a reading microscope? How is it found and corrected for?	23

MINERALOGY AND GEOLOGY.

Time, 3 Hours.

(Maximum No. of Marks, 50.)

	No. of Marks.
1. Name minerals having the following characters: Sub-metallic, vitreous, pearly, and stony lustre, foliated, prismatic, granular, compact structure, malleability, brittleness, elasticity.	15
2. How is the blowpipe used in testing minerals? What is meant by the oxydizing and the reducing flame? Give examples of the behaviour of minerals in each.	8
3. How are minerals distinguished as to their crystallization? How are the angles of very small crystals measured?	8
4. What is the chemical composition of the following minerals? Where are they principally found in Canada, and what are their uses? : Apatite, selenite, amethyst, malachite, galena, graphite.	9
5. Explain by diagram or otherwise the meaning of the following terms: dip, strike, anticlinal axis, unconformable stratification, fault, trap dyke, outlier, escarpment.	10
6. State the mineral characters of the drift formation and its geological age.	8
7. State the geological ages of the various formations encountered in travelling from Lake Superior to the summit of the Rocky Mountains by the Canadian Pacific Railway.	9
8. What are sedimentary, metamorphic and igneous rocks, and how were they produced? How are the relative ages of rock formations determined?	8

TRIGONOMETRICAL LEVELLING.

Time, 3 Hours.

(Maximum No. of Marks, 50.)

	No. of Marks.
1. Explain the method of levelling by "reciprocal zenith distances," and show how the coefficient of terrestrial refraction may be obtained from the observations.	15
2. Obtain a formula for the elevation of the place of observation in terms of the depression of the sea horizon. What difference will there be in the formula for observations taken from the same point in different azimuths? If the radius of the earth be taken as 3,960 miles, show that the square of the distance in miles of the visible horizon is very nearly one and a half times the height of the eye in feet.	15
3. Explain briefly the manner in which heights are measured with the barometer and by means of the temperature of boiling water, and mention the precautions necessary.	15
4. Explain in general terms how the force of gravity is determined by the pendulum.	15
5. In what manner does the attraction of a range of mountains affect levelling done with the ordinary engineer's level instrument? In passing over a range of mountains of which one side is steeper than another, show that levelling operations may show a difference of level between two points on opposite sides of the range which are really at the same absolute level.	15

MAGNETISM.

Time, 3 Hours.

(Maximum No. of Marks, 50.)

	No. of Marks.
1. What is meant by the magnetic declination? What are its variations — diurnal and annual?	10
2. How is the declination determined?	
3. What is the magnetic inclination, and how is it determined? How in the observation is the effect of want of balance of the needle on its axis obviated?	0
4. Explain, in general terms, how the horizontal intensity is found by the oscillations of the needle. How is the total magnetic force found from the horizontal force?	10
5. How is the total force found by means of a deflecting magnet? Describe the observation.	10
6. If the total force be observed by the method of deflection while the plane of the needle is not in the magnetic meridian, but inclined to it at an angle of ϕ , obtain a formula for reducing the observed total force to the true total force (that acting in the magnetic meridian).	10
7. If the inclination be observed with the plane of revolution of the needle in two positions at right angles to one another, and θ_1 , and θ_2 be the two values so obtained, θ the true inclination, prove that $\cot^2 \theta = \cot^2 \theta_1 + \cot^2 \theta_2$.	10
8. What are the general directions of the lines of equal declination and inclination in the southern part of the North-West Territory? What are the approximate values of the declination and inclination in that region?	10

PART III.
GEOLOGICAL SURVEY.

PART III.

DEPARTMENT OF THE INTERIOR,
GEOLOGICAL AND NATURAL HISTORY SURVEY AND MUSEUM BRANCH,
OTTAWA, 31st December, 1886.

To the Hon. THOS. WHITE,
Minister of the Interior,
Ottawa.

SIR,—The customary annual summary report on the progress of the work of the Geological and Natural History Branch of the Department of the Interior is submitted herewith.

It will be found somewhat to exceed in length previous summary reports, but with a view to meeting the demand for early publication of results it is deemed advisable to incorporate the main outlines of these in so far as they relate to mining and other industries and also as regards the case of explorations, the final results of which cannot be published in a satisfactory form before the completion of further field work.

It will be observed that during the past season the field work was in progress in eleven districts, and that in some of these in addition to the work by the head of the party independent work was simultaneously in progress by one or more assistants.

Especial thanks are due from the Survey to Mr. Joseph Wrigley, Chief Commissioner of the Hudson Bay Company, for letters to the officers at the various posts visited by the parties working in the region north of Lake Superior and around Hudson Bay, and also to the officers themselves for their uniform kindness and valuable assistance in various ways.

On the 9th of February I left Ottawa for England to superintend the unpacking and arrangement of the collections sent to illustrate the mineral, vegetable and animal resources of the Dominion at the Colonial and Indian Exhibition. I arrived in London on the 22nd of February, and a few weeks later I was joined by my colleagues, Messrs. Macoun, Adams and Willimott.

In reference to some of the practical results which may be expected, or have already arisen from the work of the Exhibition, the following facts may be mentioned :—

Plumbago.—Enquiries were constantly being made about this mineral by persons from various parts of the United Kingdom, as well as from the continent. They were referred to the various exhibitors, whose addresses were given them.

Mica.—A number of enquiries as above.

Soapstone.—Two or three gentlemen who are very anxious to find localities from which they can get continuous supplies of good soapstone were given samples of ours, which gave such satisfaction that one gentleman ordered five tons to make further trials, and they have all promised to report on the qualities of the samples supplied them, and will state in what essential the stone is deficient. The precise article required by the trade will thus be ascertained, and a considerable business in this material will, in all probability, be developed.

Asbestos.—There was a fine exhibit of this mineral; much attention was attracted by it, and many enquiries made concerning it. Several asbestos properties were sold as a result of the information given. These various refractory minerals attracted especial attention.

Chrome Iron Ore.—Samples of several of the specimens exhibited were sent to large consumers for examination. It was found that some would sell for about £4 stg. a ton in Glasgow, while others which were not sufficiently rich to pay for

exportation might be made so by a process of careful selection, or by the ore improving in depth. Now that the Eastern Townships have greatly increased railroad facilities and it being ascertained that this mineral will bring remunerative prices, it will doubtless ere long be largely exported.

The gold and silver ores of British Columbia, Ontario, Nova Scotia and Quebec also attracted much attention. As a result of the exhibition several mines have been sold, and preparations are being made for working others. Reports from the Port Arthur district show that a direct impetus has been given to gold and silver mining in that district by the Exhibition.

In this connection another very valuable result of the Exhibition is that some firms in England have made arrangements to purchase and concentrate the tailings of the principal Nova Scotia gold mines, shipping the concentrate to England for treatment. This is also a benefit to England, as this kind of work has heretofore been carried on almost entirely in Germany.

Iron Ores.—The Iron and Steel Institute made a careful examination of the various iron ores and coals of the colonies and India represented in the Exhibition and issued a report on their iron-making resources. Out of a total of 137 pages no less than 69 or one-half of the whole was devoted to Canada, and much attention was in this way drawn to our iron ores which were very highly spoken of. "It requires," the report says, "no great degree of prophetic instinct to see that before long Canada, India, New South Wales, New Zealand, and Queensland are destined to become in a greater or less degree friendly rivals with us in competing for their own and neighboring markets." The members of the Institute subsequently, after the reading of the report, visited the Exhibition and examined the ores and fuels. The ores from British Columbia, which are in proximity to coal, have been the especial objects of enquiry, and it is stated that large works for the production of iron and steel will shortly be erected in that province.

A mining engineer called and asked to see our samples of these ores, as he was about to leave for British Columbia to erect iron works, &c., to cost some three million dollars.

Manganese.—Many enquiries were made about this mineral, and the addresses of the producers in Canada were given.

Petroleum.—Experts who were found to be much prejudiced against Canadian oil say that the samples shown them were as good as could be desired and quite free from bad smell. The Exhibition will, no doubt, help to remove this prejudice.

Ochres.—Samples were sent by request to various large consumers who will examine them and report on the prices they would bring in the English market.

Slate.—Rockland slate and slate manufactures were very highly commended, and said to compare very favorably with the best qualities of Welsh and Scotch slate.

Rocks.—There were many enquiries about Canadian granites and marbles. The red granites and the grey Arnprior marbles were much admired; and it is expected that business will be done in New Brunswick granite.

Agates, &c.—Enquiries have also been made by several firms who manufacture agate goods, respecting the agates from Nova Scotia and Lake Superior. The addresses of persons who could supply them were given. The Huronian red jasper conglomerate also attracted much attention and enquiry.

Phosphate.—The attention directed to this mineral by the fine specimens exhibited—the only ones in the Exhibition—has given an impetus to this industry, and resulted in the sale of several properties.

Reports, &c.—The special Descriptive Catalogue of the Economic Minerals of Canada, already referred to, was widely distributed at the Exhibition. Detailed articles on the mineral wealth of the Dominion appeared in many of the principal papers and magazines. Lectures were given in the conference room on the natural resources of the Dominion, both mineral, vegetable and animal, while during the whole period of the Exhibition either Professor Macoun, Mr. Adams, Mr. Willmott or I was in attendance to answer the many enquiries which were daily being made respecting the climate, the geography, the geology and the natural productions of the country.

My best thanks are due to my colleagues above named for their hearty and zealous co-operation and valuable assistance in the work above referred to, and in arranging the large quantity of material which had to be dealt with, in such a manner as to make a successful and attractive display of the varied resources of the Dominion.

After the close of the Exhibition, on the 10th of November—except a few specimens that had to be returned to their respective owners—the whole of the minerals and some of the natural history specimens were packed up to be made over to the authorities who represent the interests of the proposed Imperial and Colonial Institute. The valuable collection of birds and other animals purchased or supplied from the Museum collection were all carefully packed to be returned to Ottawa, where they will be properly cared for, and be available for future exhibitions.

During my absence in England in connection with the Colonial and Indian Exhibition from the 9th of February to the 22nd of December, Dr. G. M. Dawson has superintended the work of the survey as Acting Director, and his time was so fully occupied in attending to the shipment of the mineral exhibits, in work connected with the preparation of the special catalogue printed subsequently under my superintendence in London, in editing the annual volume of Survey Reports, in completing and publishing his own report on a portion of the Rocky Mountains, in making preliminary arrangements connected with the collection and compilation of mineral and mining statistics, and in the general routine and office duties, that he found it impossible to undertake any work in the field. I wish here to record my high appreciation of the very able and efficient manner in which Dr. Dawson has performed all the work above referred to.

The collection of insects purchased from Captain G. Geddes last year has during the present year been put into a complete state of arrangement by Captain Geddes. Special acknowledgment is due in this connection to Mr. James Fletcher for his services in checking over and verifying the nomenclature of the entire collection, an operation requiring much labor and time. An important addition has been made to the museum by the purchase of the ethnological collection of Mr. François Mercier, a collection of representative character gathered by him in the course of a number of years' residence on the Yukon River. The Museum now contains a good typical collection of the arts and manufactures of the tribes of the west coast from Vancouver Island to the Arctic Ocean.

The title of the detailed report of the Survey has in the last issue been changed from that of "Report of Progress" to "Annual Report," and this issue has been made the first volume of a new series which it is intended to continue in the same form. A certain number of copies of each local report has been printed separately, and, though involving more labor in regard to distribution, and some additional expense, the plan has already proved to have many advantages, particularly in enabling the public to obtain, at a nominal cost, the information respecting any particular district.

The requirements of the Survey in respect to increased museum and office accommodation become each year more pressing, and the cramped condition and limited accommodation afforded by the building at present occupied is now such as in some instances to seriously embarrass the work in progress. It is respectfully submitted that an office of such capacity is required as would enable the apportioning of a separate room to each officer entrusted with the work in a particular district, while the museum building should have a character more proportionate to the value of the collections and more creditable to the Dominion. Several plans have been suggested by which the requisite additional accommodation could be secured at a comparatively small outlay, and I venture to hope that the matter will shortly receive the favorable consideration of the Government.

In British Columbia the exploration of the most important area of the Cariboo gold-bearing district was continued by Mr. A. Bowman, the Government of British Columbia contributing as before towards the expense of this work, which involves the mapping of a very rough district in addition to its geological exploration. It is anticipated that a map and report on this district will be ready for pub-

lication next spring. Mr. Bowman gives the following details respecting the work accomplished :—

"In continuation of the work of 1885 in Cariboo district, I left Victoria 23rd June, accompanied by Mr. James McEvoy as geographical assistant ; procured pack animals, supplies, and four additional men at the 150 Mile House, all in Cariboo district ; and on Saturday, the 3rd July, started into the field.

"Our equipment this year was suited to exploration in the mountainous parts away from the waggon road and trails ordinarily travelled.

"The field covered was, in general, the same as last year, the mining region embraced between latitude $52^{\circ} 40'$ and $53^{\circ} 40'$ N. and longitude 121° to 122° W, but the work differed somewhat in character as well as in method of execution. Last year the roads and trails were measured ; a waggon was used as a base of supplies in connection with three or four pack animals, the centrally situated mountains were occupied as triangulation stations, and geological and mining features were subordinated to geography. This year I was able to entrust most of the geographical work to Mr. McEvoy. Although our parties were equipped to move independently of each other, we generally worked together, or near each other, and my attention to the geographical work was only directed to its general progress and final completion in connection with my own investigations. From this would be excepted, however, those parts of the country visited exclusively by my party, and all the details of the geological work to be fitted into the map.

"The Goose Creek Mountains and the Selkirk Range, where there are no trails, were traversed with shoulder picks, relying on the rifle, to a considerable extent, for supplies. A micrometer measurement of the great Quesnel Lake was carried out with the aid of a large Chinese boat and an Indian canoe. Bear and Swamp River Mountains and the Dragon Creek Mountains were ascended with a single pack horse, relying on the axe for progress in lieu of a trail.

"The geographical work was completed by occupying with the transit all the necessary outlying stations, and by measuring with the steel tape two independent base lines approximately fifty miles apart, situated respectively on Snowshoe Plateau and at Quesnel Mouth, which will be used as the foundation of the whole of the work.

"In the geological work pursued by myself while thus completing our map, it was the distribution of the rocks and the mining features of the country that governed, not only my own movements, but the movements of both parties. A section was made from the limestone rocks of Beaver Lake through the gold bearing series to the northern Selkirk or Inner Cariboo watershed, between Mitchell's Lake and Canoe River, near Albreda Lake. Subsequently the cherty rocks of Bear River, which occupy a prominent position in Cariboo, were intersected at various points and in different directions. Quartz ledges adjacent to the rich placers heretofore mined were everywhere noted, examined and sampled for assay.

"As results of the season's work I may mention the discovery of abundant evidence of the continuousness, permanence and richness of quartz ledges of Cariboo, and of fossils in the gold-bearing region, which determine its age and position in the geological scale.

"The slates are of palæozoic age, and not improbably identical with those of Anderson River and Boston Bar on the lower Fraser, associated with the first gold mining in British Columbia, accordingly much older than the auriferous rocks in California, as determined. On the other hand I found near Quesnel Forks very good placer diggings, the gold of which is derived from rocks containing fossils of the 'Shasta Group' of the Cretaceous.

"The time occupied in field work was from June 23rd to November 6th, four and a half months."

Cost of field work \$3,773 45

In 1885 Mr. R. G. McConnell had been occupied in geologically exploring the Rocky Mountains to the north of the line of the Canadian Pacific railway, and it became obvious as the result of this work and that carried on by Dr. Dawson in other

parts of the mountains, that a carefully examined section across the entire width of the range at some chosen part was necessary as a clue to its intricate structure. Mr. McConnell, who was instructed to undertake the examination, reports as follows on it:—

“The principal object of the season's work was to obtain a more detailed section across the main Rocky Mountain range than the hasty exploratory work heretofore done has afforded; as it was considered that the knowledge thus obtained would greatly facilitate operations in more remote regions where the shortness and uncertain character of the season, combined with the difficulties in travelling, due to trails encumbered with wind-fall and crossed every few miles by swift mountain streams, which even near their source are often well-nigh impassable, render the prosecution of geological work both tedious and expensive. The country in the vicinity of the Canadian Pacific railway was selected as the best adapted to the purpose in view, as, to its greater accessibility, it adds the further advantage of being more accurately surveyed than any other part of the range. Work was commenced on the 24th of May, at the Gap of the Bow, and during the course of the summer all the subordinate ranges lying between that point and Golden City were ascended and examined; involving altogether climbing to the extent of over 200,000 feet. In October the weather having become too severe for further work in the mountains a short time was devoted to the examination of the Cretaceous rocks of the eastern foot-hills in the vicinity of the Bow River. In addition to the stratigraphical work accomplished, a number of sketches and cross bearings were taken from the summits of most of the mountains ascended, which will add considerably to our knowledge of the topography of the region, and a large suite of fossils was collected from the various formations represented in the range. The results of the exploration have not been worked up yet, and cannot therefore be given in detail, but the following general statements may not be uninteresting.

“The Rocky Mountains are mainly composed of strata ranging in age from Middle Cambrian to Lower Carboniferous. Along the line examined this series has a minimum thickness of 20,000 feet, and is apparently conformable throughout, although in other parts of the range distinct unconformities have been detected both by Dr. Dawson and Dr. Hector, and that deposition was not continuous throughout the entire period is shown by the fact that in the eastern part of the range the Silurian is scarcely represented, although it becomes of considerable importance on approaching the Columbia. East of the main divide the Lower Carboniferous is overlaid in places by beds of Lower Cretaceous age, and here again, although the two formations differ so widely in respect to age, one overlies the other without any perceptible break, and the separation of one from the other is rendered more difficult by the fact that the upper beds of the Carboniferous are lithologically almost precisely similar to those of the Cretaceous. Were it not for fossil evidence, one would naturally suppose that a single formation was being dealt with. This great series of conformable strata shows that prior to the last great upheaval which gave the range its present form, the region was subjected to little disturbance and no folding or crumpling of the rocks to any appreciable extent had been produced. This fact is also further evidenced by the prevalence of one dominant type of structure. From the axis of the range to the eastern edge, the beds nearly everywhere dip regularly and usually at high angles in towards the centre. This uniformity in dip is produced by a series of great fractures accompanied by displacements of many thousands of feet which have had the effect of causing the same beds to be repeated at least seven times. These faults are of great length and run in approximately parallel lines, and as soon as or before one dies out it is replaced by another a few miles distant which continues on in nearly the same direction. The range is bounded on the east by a dislocation of such magnitude that few occurrences of a similar character elsewhere can bear comparison with it, and which has affected all the formations intervening between the Upper Cambrian and Middle Cretaceous. The Cambrian limestones have been thrust forward for miles along the line of this fault and now overlie in a nearly horizontal position the black shales of the Cretaceous. West of the axis, only one fault has

been clearly made out, but the beds have been so disturbed and altered by an intrusion of igneous rock near the line of section that the structure there becomes more difficult to unravel. All the evidence collected, however, goes to show that west of the axis overturned folds and not faults play the most important part. An interesting feature of this range, and one which places it in rather an anomalous position among mountain chains is the fact that along the watershed range, and for several miles on either side of it, the beds, although folded to some extent, are less disturbed than in any other part, and in no place examined has denudation yet uncovered a granitic axis.

"In this region no mining of any importance has been attempted during the past season, with the exception of that done at Ottertail Creek, but prospecting has been actively engaged in, and a number of more or less important mineral deposits have been discovered. It may be worth while mentioning in this connection that the Cambrian and Cambro-Silurian limestone and schists, which cover most of the country between Silver City and the Columbia, are almost everywhere metalliferous, and few mountains have been prospected in this district which have not yielded ores of some kind.

"In the Ottertail district the Ottertail Gold and Silver Mining Company have worked three claims during the season. One of these, the "Louis" claim, is situated directly under the railway track, about one and a quarter miles east of the Ottertail station; the other two are on the east side of the creek, about a mile and a half up the stream from the railroad crossing. A good road has been constructed from the railroad to the mines and ample preparations made for effectively handling the ore. A little farther up the Ottertail is joined from the south by the Wetfeet Creek on which is situated the "Copper Bonanza," one of the best veins in the district. A large number of other claims have been staked out, one company alone owning over twenty within a circuit of a few miles, but with the exception of those mentioned above none are being worked at present. The uncertain state of the mining laws and the extra expense and trouble necessitated by having to register both with the Dominion and British Columbia governments, is largely responsible for this state of affairs. The ore in this locality is an argentiferous galena associated with some copper, zinc and traces of gold, and occurs in small quartz or calcite veins, running parallel or nearly so to the strike of the calcareous schists, shales and limestones, which form the country rock of the district. The veins are small, seldom exceeding eighteen inches in thickness, but are reported to contain a high percentage of silver. A stamp-mill has been put up near the C. P. R. crossing of the Ottertail by the "Rocky Mountains Mining and Ore Reduction Company," and the ore from the different mines is now crushed and concentrated before shipment.

"Near Field Messrs. Coffman & Weitman have opened up the "Monarch" and "Cornucopia" claims in Mount Stephen, and the former especially now presents a very favorable appearance, showing over six feet of solid galena. The ore there is deposited in what miners call a "blanket-lode," and appears to impregnate a zone of interbedded calcareous rocks. It has been traced along the face of the mountain for several hundred yards, and since I was there Mr. Pattee, of Carleton Place, by blasting out a trail around an almost vertical cliff, has been enabled to explore it still farther and reports the discovery of a deposit nine feet thick. The galena is low-grade in silver, containing only from 4 to 11 oz. to the ton (See assays 19-22, part M, Annual Report of the Geological Survey for 1885), but possesses compensating advantages in the extent of the deposit, the easy and comparatively inexpensive manner in which it can be worked, and in its proximity to a railway station.

"A vein of calcite flecked through with grains of cinnabar is being opened near Golden City, and is interesting as being the only deposit of the kind known in the entire region."

Cost of exploration \$1,094.17.

Mr. J. B. Tyrrell, assisted by Mr. D. B. Dowling, was occupied during the entire summer in completing the geological exploration and examination of the country between the Bow and the North Saskatchewan River, east of the 115th meridian.

A report and map of this district will be prepared during the present winter. Mr. Tyrrell furnishes the following summary of the work accomplished:—

"Accompanied by Mr. D. B. Dowling, I left Ottawa on the 10th of May and proceeded at once to Calgary where our horses had been left in the autumn of 1885. Having there obtained men and the necessary supplies, we started eastward to the Lord Lorne Crossing of the Red Deer River where our survey began.

"Following the trail which Lord Lorne had marked out in the summer of 1881 we crossed Bull Pound and Berry Creeks and traversing a stretch of flat 'alkaline' country reached Sounding Creek. We there left the trail and followed the creek in its winding course for one hundred and twenty miles till it reaches Sounding Lake, lying in the middle of the Neutral Hills. Leaving this lake and crossing the hills in a westerly direction we reached Nose Creek, which we followed northward to its confluence with the Battle River, a little above the crossing of the Fort Pitt and Sounding Lake trail. The next few weeks were spent in examining the valleys through which streams run down into Battle River from the north, working from east to west in order to be able to reach Edmonton about the middle of July.

"During this time we were able to define with a fair degree of accuracy the northern extension of the low anticlinals, which had already been noted by Mr. McConnell in the region to the south, as bringing the sandstones and clays of the Belly River series to the surface from under the shales of the Pierre group.

"At Edmonton I secured a boat and in it made a traverse of the Saskatchewan as far east as Fort Pitt, while Mr. Dowling went round by the north trail with the horses and waggons, at the same time making an odometer survey of the line of travel and as much of the surrounding country as the time at his disposal would permit. Turning west from Fort Pitt we followed in succession the Vermillion River, and other streams flowing north into the Saskatchewan, till we again reached Edmonton, thus completing our preliminary examination of the district lying south of the North Saskatchewan and between the fourth principal meridian and the Edmonton-Calgary trail.

"Our attention was then turned to the country lying to the west of this trail. We proceeded overland to Rocky Mountain House where we constructed a boat and sending the teams back as they had come I descended the river to Edmonton, making a geological examination of its banks, and a track-survey of those parts which had not yet been surveyed. Afterwards we went south-west to Pigeon Lake, made an examination of Battle Lake and the upper portion of Battle River, thence went west to Gull and Back Lakes, the Blind Man, Medicine and Wolf Rivers, returning to Calgary on the eighteenth of November, when our horses were sent out to be herded and our outfit left in store for the winter.

"During the course of the season special attention was paid to the occurrence of the different coal seams throughout the district, they having been found to underlie a very much larger extent of country than could have been thought at all probable.

"The 'Big Coal Seam' on the Saskatchewan, for instance, was found to be on the continuation of a coal horizon stretching north-westward from Knee Hills Creek and the Red Deer River, underlying country which is at present completely grass-covered, and shows no external evidence of coal anywhere in the vicinity. Along the above mentioned river this seam has been burnt in a number of places, and the ashes which were collected at the foot of the bank have been assayed by Prof. Chapman, of Toronto, who finds that they contain small quantities of both gold and silver.

"Besides matters of strictly geological interest, the character of the different soils has been noted, as well as the amount and character of the grass or timber growing thereon, so that it will now be possible to bring out a map showing the limits of the prairie and wooded countries, with notes on the nature of the underlying soils. Careful barometric readings have also been taken at numerous points throughout the area examined, in order to lay down on this map contour lines, sufficiently close to show at least the general slopes of the country.

"A number of fossil remains, both of plants and animals, were collected during the season, while Mr. Dowling devoted time to the collection and preservation of objects of natural history, of which mention is made on a succeeding page."

During the season forty-three photographs were taken, illustrating the character of the country. Field work ended on the 18th of November, when the party reached Calgary.

Expenditure, \$2,604.15.

Mr. A. C. Lawson, assisted by Mr. W. H. Smith, was engaged in the geological survey of the country to the east of the Lake of the Woods, the work being devoted principally to the mapping of the sheet which includes Rainy Lake and its vicinity, but covering also portions of adjacent territory and certain connecting lines which were found necessary in order to complete the geological and topographical information.

Mr. Lawson left Ottawa for field work on the 15th of June and returned from the field on the 12th of October. As the work of another season will be required to complete the information for the Rainy Lake sheet, Mr. Lawson has prepared a synopsis of the geological results so far arrived at in some detail, as follows:—

"The season's operations were begun at Wabigoon, where Mr. Smith was instructed to carry through a micrometer and compass survey from a fixed point on the Canadian Pacific railway to Rainy Lake by way of the Manitou canoe route to connect with the system of township surveys on the Rainy River. The west side of the lakes on this route was mapped in detail as far as the middle of Manitou Lake, from which point onwards both sides were embraced in the survey, being within the limits of the Rainy Lake sheet. Several weeks were next occupied by Mr. Smith in completing the survey of the north-western expanse of Rainy Lake from Coutchiching northward to the Devil's Falls. In addition to the usual micrometer and compass survey, a transit line was run between the two latter points, as a basis upon which to check the variation of the compass, which does not appear to be uniform throughout the district. This done, Mr. Smith next made a survey of an important chain of lakes extending from the bottom of Redgut Bay, Rainy Lake, to Lake Manitou, which it is believed has never hitherto been explored. During the last few weeks of the season Mr. Smith was engaged in completing certain detached surveys near the mouth of the Rainy River and in the south part of the Lake of the Woods, which stress of weather or other adverse circumstances had interfered with the previous season; so that nearly all the topographical material requisite for the mapping of the Rainy River sheet is now on hand.

"After having at the beginning of the season provided Mr. Smith with men and equipment requisite for his survey of the Manitou route, I left him at Wabigoon and proceeded to Rat Portage. Here two or three days were spent in the usual preliminary arrangements, and in inquiring into the state of the mining industry of the district, after which I proceeded to make a topographical and geological survey of the canoe route which extends from Lake of the Woods to Rainy Lake *via* Crow Lake and Pipestone Lake. The route consists of a chain of large lakes which have never heretofore been mapped. The west side of Crow Lake had previously been traversed by the survey, so that work was begun in the neighborhood of Turtle Portage, and carried along the south side of Crow Lake, thence through Boulders, Sand-hill and Schist Lakes into Pipestone Lake, and then through Stonedam, Loon, Jackfish and Footprint Lakes to the north-west bay of Rainy Lake. The survey was made by means of a Massey's patent log, the portages being chained, and was checked at various points on previous surveys. The Keewatin (Huronian) rocks of the Lake of the Woods were traced out eastward and southward of Crow Lake, and were found to have an extensive development in those directions to a point midway between that lake and Rainy Lake; and as the same rocks are found along the Manitou route, it would appear probable that they occupy the intermediate country between the two routes, although that is a point which has yet to be investigated. On Stonedam Lake the Keewatin rocks give way to granitoid gneisses. The gneisses continue through to Rainy Lake, and it was here observed that they exhibited a more decided tendency towards a differentiation than has hitherto been noticed throughout the region. The two types into which the gneiss here resolves

itself are a rather massive syenite gneiss and a more distinctly laminated biotite gneiss. An attempt was made to trace out this differentiation, not only on the Pipestone route, but also on the western shores of Rainy Lake, by subjecting them to a more critical examination than had been given them at the time of their topographical survey during the previous season. This attempt met with some measure of success, and it was found that throughout the field there can be distinguished as regards mineralogical composition :—

1. (a) Hornblende syenite gneiss. } With little or no quartz.
- (b) Mica syenite gneiss. }
2. Quartzose biotite gneiss.

“Both of these vary much in their texture, from coarse grained granitoid to regularly foliated gneisses. Often they are marked off from each other very distinctly, and when this is the case the syenitic gneiss appears to occur between the quartzose biotite gneiss and the lowest member of the green schists of the Keewatin (Huronian) series. At other times the quartzose biotite gneiss and the syenitic gneiss so confusedly intermixed that it is a hopeless task to attempt to separate them. Whether these two types of gneiss can be sufficiently separated to permit of a geological generalization, which would be of service in the elucidation of this great fundamental series of rocks, can only be ascertained after the field notes have been carefully plotted. The belt of Keewatin rocks which crosses the Kishcoteina route between Lake Kishcoteina and Lake Despair was studied in detail and traced in continuous connection with the area of the same rocks examined earlier in the summer on Crow Lake and Pipestone Lake. Some three or four lakes, of which Kaktimiagamak Lake is the most important, were surveyed, and added to the topography of this route. The geological features of the northern part of the Manitou route were mapped by the aid of the topographical sheets supplied by Mr. Smith's survey. The section proved an extremely interesting one, revealing, among other things, an extensive fault, with which is probably associated the origin of the long, narrow, deep body of water known as Lake Manitou.

I returned to Rainy Lake by the Little Canoe route, making a log survey of the several lakes which forms it, and mapping the geological features exposed on their shores. These four approximately parallel routes, the Kishcoteina, the Pipestone, the Manitou and the Little Canoe, together with two others, the Little Gull Lake route and the Big Canoe River, which have yet to be surveyed and examined, afford as many parallel sections across country by the aid of which, since they are all more or less interlacing, it is hoped that the distribution of the different formations in this part of the field will be satisfactorily mapped.

“In the southern part of Rainy Lake some time was spent in working out the geological features of the islands and part of the south shore, as well as of those portions of the north shore which required special investigation in the light of the previous season's work; and considerable additions were made to the topography. The most interesting fact brought to light is, that, whereas on the Lake of the Woods and in the northern part of the Rainy Lake district the hornblende-schists and the altered traps which constitute the base of the volcanic division of the Keewatin series are generally (though not always) in immediate contact with the granitoid gneisses, here there occurs between the green schists and altered traps, and the fundamental gneiss, an immense development of mica-schists with some fine-grained, evenly laminated, micaceous gneiss. The underlying granitoid gneiss bears the same intrusive relation to these mica-schists as it does to the basal hornblende-schists of the Lake of the Woods. The formation appears to thin out towards the north and to expand in volume to the south into Minnesota. It constitutes the floor upon which the present green schists and altered traps have been deposited, and its intervention between the latter and the granitoid gneiss, to a thickness of between two and three miles or even more, is a striking and conclusive argument, so far as regards this region at least, against the theory which would make lithological character a function of age, and therefore an indication of the relative ages of the non-fossiliferous rocks.

"For the purpose of acquiring a knowledge of the geological features of the south-eastward continuation of the Rainy Lake formations, and at the same time of becoming familiar in a general way with the features of the country between Rainy Lake and Thunder Bay, the last few weeks of the season were devoted to an examination of the shore of the canoe route along the Canadian side of the Minnesota boundary, and the field work was brought to a close at Port Arthur."

Expenditure in connection with work, \$1,387.36.

Mr. A. P. Low, accompanied by Mr. J. M. Macoun as assistant, left Ottawa on the 10th of May, and proceeded to Selkirk, to await the departure of the first boat for the mouth of the Berens River, on Lake Winnipeg. This point was reached on the 28th of May.

Here, having purchased canoes, the season's work was commenced, and a micrometer survey was carried up the Berens River to the height of land, between the waters of Lake Winnipeg and those falling direct into Hudson Bay.

This point was reached on the 17th of June, the distance along the route surveyed being 168 miles. From its mouth the Berens River trends a few degrees south of east for 102 miles to Family Lake. Throughout this distance its course is broken by numerous small falls, entailing many short portages.

At Family Lake the river bends sharply to the north, and the survey line runs in a slightly north of east direction to the height of land, and passes through several small lakes in that distance.

The water-shed was passed by a short portage, ending at two small lakes on a small stream at the head of the middle branch of the Severn River.

Following this stream in a north-east course, and on the way passing through several little lakes surrounded by broken, rocky and barren country, the party reached Deer Lake on the 19th of June. This lake is distant twenty two miles from the height of land, and is very long and narrow, with several deep bays. Here the track survey which had been made by Mr. Cochrane in 1882 ended, and, having been unable to obtain an Indian guide beyond this point, much trouble was experienced in finding and following the river running out of the lake. Descending the outlet for 175 miles, another large lake was reached, the shores of which were covered with a fair growth of timber, and the soil in the vicinity of which appeared suitable for cultivation. This is called Favorable Lake.

Following the river running out of it, for 100 miles, a larger lake, called Sandy Lake, was entered. The country along the river was flat, and if not too swampy would make good farming land.

From Sandy to Severn Lake the distance is 150 miles by the river, which runs through moderately good country. Here an Indian was met who acted as guide to the Hudson's Bay Company's post on Trout Lake, distant fifty-five miles, the intervening country being flat and swampy with a small growth of black spruce and tamarac. Mr. Low was informed at Trout Lake that summer frosts were rare and never damaged the crops of potatoes and roots grown there. No attempt has been made to grow grain. Leaving Trout Lake the survey was carried down the Fawn River, the outlet of the lake, which falls into the Severn River, 226 miles from the lake, and sixty miles from Fort Severn, at its mouth, which place was reached on the 6th of August, thus completing a line of micrometer survey from Lake Winnipeg to Hudson Bay, 882 miles long.

From Severn the party proceeded along the coast to York Factory. The shore between these points is very low and sandy, covered with a scant growth of grass and moss, the tree line being distant several miles from the sea.

The return journey was made from York in a small boat, by ascending the Hayes River route to Norway House, and thence down Lake Winnipeg, reaching Ottawa the 19th of October.

From Lake Winnipeg to Deer Lake the country passed through is rough and rocky, covered with a small growth of black spruce, aspen, poplar, banksian pine, tamarac and white birch.

From Deer Lake to Severn Lake the surface is much more even and the soil and timber better, the latter consisting of white, black and balsam spruce, aspen and balsam poplar, tamarac and birch, many trees exceeding 18 inches in diameter three feet from the ground. This section of the country is fit for agricultural occupation, but great difficulty will be experienced in obtaining an outlet until a railway is built.

Between Severn and Trout Lakes, and for 100 miles down the Fawn River, the country is very flat and swampy, the timber being chiefly black spruce and tamarac of small size.

Beyond this, as far as the sea, the river cuts more deeply into the surface of the country, forming a valley the banks of which are composed of sand and clay, and varying in elevation from 50 to 200 feet. Beyond the valley the soil appears light and poor, and in many places swampy, sustaining a small growth of black spruce and poplar. The rocks met with are all Laurentian as far as Favorable Lake. Here, and along the route to Trout Lake, several bands of Huronian rocks are seen together with the Laurentian. These bands are highly magnetic and contain large quantities of pyrite.

Expenditure in connection with field work, about \$2,600.

Dr. Bell was requested as early as possible in the season to visit the Grand Manitoulin Island with a view to examine and, if found necessary, correct the topographical and geological lines that had been laid down to be engraved for publication on the sheet map No. 126, on a scale of a quarter of an inch to a mile, and which had been prepared from the surveys made some years previously and would therefore, it was considered, probably require corrections and additions before being republished. Later in the season Dr. Bell was to explore a portion of the region lying to the South of Hudson's Bay and west of the District of Keewatin.

On this work Dr. Bell reports as follows:—

"In pursuance of these instructions I left Ottawa on the 12th of June and spent a short time on Manitoulin Island, where, being favored by fine weather, I got over a good deal of ground, but it was not found necessary to make any material change in the geological lines as they had been laid down. Two days were spent at Sault Ste. Marie where I hired six voyageurs for my northern exploration. On arriving a day later at Port Arthur, these men were sent on immediately with Mr. John Macmillan and Mr. Alfred P. Murray, who were to act as my assistants, to Wabigoon tank on the Canadian Pacific railway, which was selected as our starting point. Provisions and other supplies were purchased at Port Arthur the same day and forwarded to Wabigoon tank. I had ascertained by correspondence that it would be difficult to obtain bark canoes, which are almost essential for the kind of work which lay before us. In the course of a few days, however, I succeeded in obtaining four canoes large enough for carrying my party and all the supplies we required for the whole season. Smaller canoes were afterwards obtained from time to time as required.

"Before we could start on our canoe voyage everything required to be transported over a 'tote road' from Wabigoon tank, a distance of eight miles, to Sandy Lake. Leaving this long portage on the 6th of July the general course of my route was north-eastward, or towards Cape Henrietta Maria on Hudson's Bay.

"From Sandy Lake I proceeded to Lonely Lake by way of Minnetakie Lake and its outlet. My route then lay through Osnaburgh Lake (or Lake St. Joseph) and the upper part of the Albany River, from which I crossed the country northward to the Attawapishkat River and descended this stream to the sea. Coasting southward on the west side of James' Bay, the Albany River was reached and ascended to The Forks, or junction of the Kenogamin River. Following this stream to its source we passed through Long Lake and descended the Black River to its intersection with the Canadian Pacific railway.

"Exploratory or track surveys were made of the route followed from the time we entered Long Lake till I reached The Forks of the Albany River, with the exception of the coast of James' Bay between the mouths of the Attawapishkat and

Albany rivers. In making these approximate surveys, the distances were ascertained by a boat's log or by the time occupied in traversing them at a known speed, while the bearings were taken by compass. Observations for latitude were made almost every day, and the variation of the compass was also frequently ascertained, so that I have the means of checking my positions as given by the above method. Careful sketches were always made of the shores of lakes and rivers, the positions of islands, points, &c., being checked by frequent bearings. The total length of the exploratory surveys made during the season by myself and assistants cannot be stated until the work shall have been plotted. In the course of my journey upwards of forty photographs were taken, which show the character of the natives, the scenery and the surface geology of the country traversed.

"From the above general sketch of my route and of the methods employed, the following brief account of the work done will be the better understood. In passing through the eastern part of Lonely Lake a track survey was made of our route as an addition to the approximate survey of this part of the lake made by myself in 1883; and from the head of Lonely Lake (simultaneously with the geological examination of the country) surveys of the same kind were continued as above stated. Leaving the eastern extremity of Lonely Lake we ascended the small river which flows into it, and turning up one of its eastern branches we reached the height of land near Osnaburgh Lake.

"In passing through Osnaburgh Lake we explored its principal bays and then descended the Albany to the outlet of Eabamet (or Labamet) Lake, on the north side. It was here that we turned northward and followed up a chain of lakes, discharging by small rapid streams from one into another until we gained the height of land, separating these waters from those of the Attawapishkat River. From the head of this chain of lakes it had been our intention to follow a small river, which was reported to flow northward into a lake on the Attawapishkat River, but not succeeding in finding it we descended a rapid stream with many portages, which followed a north-easterly course to its junction with this river. Two days before I reached the Attawapishkat, Messrs. Macmillan and Murray with two men were sent back to do other work which will be referred to further on.

"On arriving at the Attawapishkat I left my stores and large canoe in charge of one man on an island at the junction of the rivers, and which I called Nolin's Island, and proceeded with the other men to examine the upward course of the larger stream for some distance previous to descending it to the sea. At about eleven miles above Nolin's Island we reached the lowermost lake of the Attawapishkat, which the Indians informed me bears the same name as the river itself. It lies diagonally across the course of the river, and has a length of about nine miles from south-west to north-east by four miles from south-east to north-west. Two miles above Attawapishkat Lake we entered a beautiful lake of much larger size, which having as yet no distinctive name I propose to call Lake Lansdowne, in honor of the Governor General of the Dominion. This lake proved to measure about thirteen miles from south-east to north-west by about ten miles from south-west to north-east, and it is the largest sheet of water connected with the river. It contains many large islands and is much indented with bays. The surrounding country is more or less undulating and hilly, and thus affords a pleasing contrast to the level and monotonous character of nearly all the rest of the region explored during the season. The commencement of the upward continuation of the Attawapishkat River is found in the south-western bay of Lake Lansdowne. This part of the river is described by the Indians as being broad, having, for the most part, a sluggish current and expanding occasionally into small lakes.

"The Attawapishkat River proved to be somewhat smaller than the Albany, which is not far from the size of the Ottawa above the capital. It descends at an almost uniform rate all the way from Lake Lansdowne to the sea, a distance of several hundreds of miles, notwithstanding the fact that in the upper part of its course it traverses Laurentian and Huronian rocks, while the lower portion flows over unaltered flat-lying limestones. In this distance we did not require to make a single

portage and from the description of the river above the lake, it would appear to be navigable without portages almost to its source, which has probably an elevation of more than 1,000 feet above the sea. Where it flows over the limestone country it is broader and shallower than in the higher parts of its course.

"Along the upper part of the river the banks were lower than further down, where the spring freshets fill up the bed of the stream to a height of from twenty to thirty feet, and even more, above the summer level, and the ice which comes down at these times has swept the banks clear of all obstructions and given them a uniform appearance throughout, except where cliffs and islands of limestone occur.

"The shores and islands of Lake Lausdowne are well wooded with large spruce, tamarac, aspen and rough-barked poplar, with fair sized cedar and white birch; and the same kinds of wood continue along the banks of the river for many miles down, but the timber at a distance from the water is of smaller size. In the low, level country, not only along the lower part of this river, but on the west side of James' Bay generally, the greater part of the area between the rivers appears to consist of open sphagnum plains, with some small spruce and tamarac trees, either in groves or scattered singly, while the immediate banks of the streams are well wooded. In places the better class of timber forms belts extending for some miles back from the rivers. The fossiliferous limestones of the west side of James' Bay extend for a considerable distance inland on the Attawapishkat River, but they can only be mapped when my approximate survey shall have been plotted. The sea coast between the Attawapishkat and Albany rivers is very low and uniform in outline and without indentations. The water is so shallow that we could touch the bottom with our canoe paddles at from half-a mile to one mile from the shore. In order to pass the bouldery reefs, which extend from the shore north of the Albany, we were obliged to go so far out from the land that the tops of the trees were barely visible at the highest places.

"A careful track-survey of the Albany was made from its mouth to The Forks, which, with that of the upper part also made during this season, when plotted, will enable me to map the whole course of this river, an actual survey of the intermediate portion having been made by myself in 1870. This river possesses additional importance from the fact of its constituting part of the northern boundary of the Province of Ontario.

"From the mouth to The Forks the river passes through a low and very level country, and it is characterized by a wide shallow bed with ice-swept banks like those of the Attawapishkat, but of somewhat greater height. On the Albany the limestones do not form conspicuous cliffs and islands as on the latter stream. The numerous large islands in the Albany form one of the features of the river between The Forks and the sea. My supposition, based on former explorations, that the Devonian limestones extend from James' Bay nearly, if not quite, to The Forks, has been confirmed by the present year's examinations.

"The Kenogamin River and Long Lake are described in my Reports for 1870 and 1871, but the Black River had not been previously examined geologically. The rocks in its valley were found to consist of crystalline schists and diorites, granite, syenite and gneiss.

"Before reaching the Attawapishkat River, as already stated, Messrs. Macmillan and Murray with two men were sent back to perform other duty. They were instructed to make a track-survey between Eabanut Point and Abasotiketchewan Lake on the Albany, to the latter of which my instrumental survey of 1871 had extended. They were then to proceed to make a geological examination of Cat River from Osnaburgh Lake to Cat Lake and to return home by way of Wabigoon. On my return here I found they had accomplished the above work with the exception of the upper third of the Cat River. By using the map laid down from micrometer survey by Mr. Thomas Flawcett, D.L.S. (for the use of which we are indebted to Surveyor-General Deville) along with the track-survey made by Mr. Macmillan in connection with his geological notes, a considerable addition is made to our knowledge of the distribution of the rocks in the region which he traversed."

Mr. E. D. Ingall left Ottawa for his field of work in the Thunder Bay District on the 9th of June, returning to Ottawa on the 13th of November. He was assisted by Messrs. H. P. Brummell and J. H. Moore, and was engaged principally in continuing and completing his work previously carried out in connection with the Silver Mountain and Rabbit Mountain mining regions and adjacent territory. This work will be made the subject of a detailed report, accompanied by a map, as soon as the results can be elaborated. Mr. Ingall has prepared the following sketch of the mining developments of the district, which embodies the main results arrived at, in advance of the detailed report :—

"The new mining region to which attention is now especially directed lies west-south-west from the town of Port Arthur on Thunder Bay, Lake Superior, which place is the headquarters of the mining men and explorers.

"The discoveries are situated along the northern fringe of a range of hills forming the southern boundary of the valleys of the Kaministiquia and Whitefish Rivers as far as the source of the latter, a distance of some 60 miles from Port Arthur.

"There are two chief centres of activity in this belt of country which is from four to six miles wide, namely, Rabbit Mountain and Silver Mountain. At these two places numerous mining locations have been taken up. On some of the most promising of these a fair amount of work has been done towards testing, whilst on the rest little or no developments have been made. In some cases it seems doubtful if the purchasers were ever in the country at all, for many locations are situate in valleys where the rock must lie under a very considerable thickness of clay or even of swamp soil.

"Besides the veins located around these two places a fair amount of exploration and acquirement of locations has gone on around Whitefish Lake in the same series of rocks, and a few have been located in their extension south of this, towards the international boundary at Pigeon River.

"The surface of the region consists of a number of flat-topped hills, frequently roughly circular, separated by valleys about 200 to 300 feet deep. From the tops of the hills down, the rock is shown in cliffs varying in height from 30 to 150 feet, below which the debris fallen from above slopes off at an angle of about 45° for probably another 50 feet when it merges into the gentler slope of the clay and soil filling the valley.

"Geologically the rocks in which the veins occur belong to the Animikie Series which is presumed to be Lower Cambrian. The strip of country containing the discoveries is from two to four miles away from and runs roughly parallel to the junction of these Animikie rocks with the granitic rocks, and other rocks to the north referred to the Huronian.

"The Animikie rocks of the Silver Mountain district lie nearly horizontal and consist of diabase trap, black argillites and some ferruginous dolomites, chert and jasper. The diabase caps the tops of the hills and has a thickness of from 150 to 200 feet, but the hills being bevelled off all round the thickness of the rocks shown in the cliffs is only from 50 to 100 feet. Below this trap come about 200 feet of argillites, whilst at Silver Mountain below this again are to be seen about 100 feet of the chert and jaspery beds. The depth to which these latter extend cannot be ascertained as the soil of the valleys covers up everything below this.

"The trap occurs also as intrusive sheets, and although it is most probable that dykes of this rock occur I have not as yet been able to identify any. If they do exist in the Silver Mountain area they must have weathered away more easily than the other rocks and for this reason are always covered up. The reverse of this is found to be the case in the section of these rocks shown along the coast of Lake Superior between Port Arthur and Pigeon River where the dykes form points and even protrude as distinct walls on passing inland from the shore.

"The argillites are in places soft and black, whilst at others they are harder and siliceous, and again at others contain a small proportion of magnetite.

"The lower siliceous beds consist of a variety of rocks, black, white and green cherts and jaspers, the latter often plentifully sprinkled with vermillion spots. Inter-

stratified with these are irregular beds of dolomite, generally rusty colored from the presence of iron. These siliceous rocks all contain iron in varying amounts—sometimes as ferric oxide, sometimes as magnetic oxide; the latter occasionally forming such a large proportion of the rock as to constitute an iron ore. An analysis of a specimen of such ore gave Mr. Hoffman 53 per cent. of metallic iron and no titanitic acid.

"The principal veins of the Rabbit Mountain district are seen to cut through similar hills of black argillites, capped by the same kind of trap, but as I have only begun a detailed examination of this latter district I can not yet say whether the section downwards is the same in detail as at Silver Mountain.

"To the north of Whitefish Lake and west of Silver Mountain is an area consisting chiefly of the siliceous group in which several veins have been discovered, whilst a few which have been located on the south side of the lake cut the argillite group.

"These lodes are true fissures, as evidenced by the way they have faulted the 'country' rock, the vertical displacement varying in different cases from a few feet up to 70 or 80 feet in one case. They vary in their size and definiteness in the different beds. In the trap they are generally wide and filled with a solid mass of gangue minerals, often having in the centre large cavities or "vugs" lined with coarsely crystallized calcite, whilst in the argillites they are composite, breaking up into a number of branches and stringers distributed through the 'country rock,' or else they form a regular brecciated vein with the gangue minerals crystallized around the enclosed portions of the argillites. The veins which have been discovered in the lower cherty beds are generally more solid and with more definite walls than those in the argillites.

"At times great difficulty is experienced in following these veins in the argillites owing to the fact that in drifting or sinking they pass from a good solid vein to portions where it is all split up into numerous small stringers, distributed through a large thickness of 'country' rock, so that only one or two of them can be followed. This has sometimes led to the belief that the vein had 'pinched out,' and that the veins do not continue downwards. This is, however, an erroneous belief, for such very shallow fissures would hardly have produced the amount of displacement of the rocks so frequently found, and further, one would naturally expect such local splitting up and indefiniteness of the veins in such laminated rocks as these argillites. This idea is borne out by the appearance of the veins where they cut the upper trap. This being compact, they are there large and solid. I feel sure that where there is a vein showing evidence at other points of being a 'strong' one, if followed carefully through the distributed part, it will again come together and become solid, and this has been the case in more than one instance in the region.

"The gangue or veinstone in these lodes consists mostly of barite, calcite and fluorite (green and purple) with white and amethystine quartz. The relative proportions of these minerals vary considerably in different parts of the vein. The silver occurs in the form of argentite and native. The former is the most common, the latter, so far, seeming to be confined to surface or to some slight depth below it. The other metallic minerals are pyrite, blende and galena. The two latter vary in the amount of silver they carry, sometimes assaying none, sometimes yielding a considerable percentage.

"It seems to be the rule, so far, that where the vein is charged with silver the blende and galena also carry it although it is not visible in them, whilst, away from these places, they are as a rule either poor in silver or wholly free from it.

"The veins usually have the silver concentrated in spots in them, these ore bodies being of greater or less extent and varying much in their richness, sometimes assaying even into the thousands of dollars per ton, sometimes bodies yielding \$100 down to \$10 or less per ton. Between the ore bodies are barren stretches of greater or less extent where the vein carries either a small proportion of blende, pyrite and galena or often no metallic mineral at all. At those places where they cut the upper trap bed the veins either carry no silver or very little.

"Although much exaggerated talk has been indulged in in the locality to which one cannot subscribe, the occurrence of rich silver ores in the veins is a fact.

"I have personally visited some eight different properties where I have seen excellent ore in the veins in bodies of greater or less extent. In some cases the quantity has been small but encouraging as an earnest of more extensive bodies yet to be discovered by underground development, whilst in others the extent of the ore has been such as to yield from \$5,000 to \$30,000 or perhaps more.

"The precious metal is not found all at one spot in the veins. In one instance I was recently present when some very rich ore was taken out which was full of argentite in the form of nuggets and sheet leaf, and 600 feet from this spot silver was recently found in another opening on the same vein.

"At another place equally rich ore was discovered at a depth of 160 feet, a body of rich ore having been previously taken from the outcrop of the vein, and mill rock is now being taken out at a depth of 40 feet.

"In yet another instance very rich ore was taken out of the vein at one place and, although this did not prove extensive, further development disclosed some good ore near the first body, though sufficient work has not yet been done to judge of its extent. On the same vein ore running about \$200 to the ton has been found at a mile distant from the first discovery.

"The chief development work in the region has been made at the following points:—Silver Mountain East End, Silver Mountain West End and Crown Point in the Silver Mountain district, whilst in the Rabbit Mountain district the chief work has been done on the Rabbit Mountain, Beaver and Porcupine veins. At all of these points ore of greater or less richness and extent has been obtained. At Rabbit Mountain a mill is now erected to treat the ore with a daily capacity of 15 tons, which has been running since 1st August last, whilst at the Beaver mine a similar mill, but of larger capacity, is being built. None of the mines have as yet attained a depth below the overlying trap of more than 200 feet, and they are therefore all in the argillite. The reason of this is that nearly all the veins intersect hills or ridges some 200 feet high, and it has therefore been most natural to commence by driving tunnels into the sides of these hills.

"The opening up of the region has not been nearly so rapid as it ought to have been, owing to the many disadvantages under which it has labored, of which I propose to speak at length in my detailed report.

"For these reasons the district is not yet out of its trial stage nor will it be until there are a few mines opened up to a much greater extent than those at present existent, and we must anxiously await the confirming results of developments in depth. The question must be solved in several cases as to whether these ore bodies occur at sufficiently frequent intervals in the veins to pay for going through the intermediate stretches of poor ground, but I see no reason at present for supposing they do not.

"The region will of course have its failures as all mining districts have, where a great many of the veins found never develop into anything, but such does not prevent it from becoming an active mining region with many successful enterprises.

"Considering the difficulties under which prospectors labor and the comparatively small amount of prospecting and development done I think the results are very encouraging, and were the locality under more favorable conditions there would be ten times the amount of activity now observable. The development of the district requires not only energy, but the right direction of this energy, and the pursuance of a liberal policy both by the owners of mines and the government controlling the land, the former when without the requisite means to develop the mines must not drive away the capitalist by counting on large sums for the mere right to work.

"Besides the possibilities of this section in the direction of silver mining there is a chance of its coming to the front as an iron producer, for the prevalence of magnetite and other forms of iron in the lower siliceous beds of the series raises the expectation that exploration may lead to the discovery of points where the iron ore occurs in sufficiently large and pure beds to be profitably worked.

"The attention of explorers has just now been turned to this question by the successful working of the iron deposits lately discovered at Vermilion Lake, in the United States Territory, which I recently visited, as mentioned above. These mines are situated in Minnesota and are about 120 miles west-south-west from Silver Mountain. Such has been the success attendant upon their opening that within the last two years the little town of Tower, with 2,000 inhabitants, has sprung up in the middle of the wilderness, and some 60 miles of first class railroad, now operating, connects it with the nearest shipping point on Lake Superior, and in about two months this railroad will be completed through to Duluth. At the present lake terminus of Two Harbours a little village has sprung up and there are complete docks for shipping the ore.

"The Company working the mines has nearly 1150 men on its pay roll at present, and are shipping 1100 tons of ore per day, worth about \$5,700, or at the rate of about \$1,700,000 per annum.

"There seems to be a prevalent opinion amongst the explorers and mining men of the district that the chances are good for the range of iron deposits to continue into Canadian territory. They run in that direction, and it is stated by some explorers that iron deposits have been found at intervals in a north-easterly direction from Tower as far as and even over the Canadian boundary. This point, however, requires further investigation.

"The ore at Tower is in the formation which is generally known in the region as the Huronian green slates, and as there are similar green slates in the Thunder Bay region the correctness of these statements seems probable. I have myself seen outcrops of similar though perhaps not quite identical iron ore deposits in this formation at other points on the Canadian shores of Lake Superior and at Kaministiquia station, on the Canadian Pacific Railway, the slates at which place may be the extension of the Vermilion Lake formation or of a parallel belt. Mr. Peter McKellar reports the discovery of a very large iron ore deposit near the Huronian Gold Mine, but this I have been unable to visit."

Expenditure in connection with field work \$1,333.63.

Mr. E. Coste was engaged during the season of 1884 and the greater part of that of 1885, in the geological survey of sheet No. 113, Ontario, this sheet having been selected as that covering certain important mining districts. It includes parts of Hastings, Northumberland, Durham, Peterborough and Victoria counties.

The extremely untrustworthy character of much of the geographical and topographical information available for the part of the province in question, and the necessity of measuring and resurveying many lines in order to produce a map of sufficient accuracy for the proper delineation of the geological features, together with the geological complications which were discovered, combined to render the progress of this work much more tedious than had been anticipated. In view of these circumstances and the fact, which became evident in the course of the work, that the region immediately surrounding Madoc and Marmora required minute investigation and a very detailed survey, in order properly to establish and explain the nature and relations of the deposits of iron ore and of the auriferous mispickel and quartz veins, with the granitic and dioritic igneous masses—a relation noticed by Mr. Coste in 1884—it was considered advisable to give this particular investigation the first place in the work of the present year. Mr. Coste reports that with the assistance of Mr. J. White as topographer, a map of the Madoc and Marmora region, including an area of about 700 square miles, has now been completed on a large scale. In addition to this work, about seven weeks were spent on portions of the northern part of sheet 113 outside this particular area. The complicated outline of the edge of the Cambro-Silurian limestones on the Archæan rocks had previously been mapped across the sheet by Mr. Coste, but with the purpose of endeavoring to separate the Trenton and Black River groups of the Cambro-Silurian Mr. H. M. Ami was requested to make a palæontological examination of these rocks, which he successfully accomplished and at the same time obtained a number of interesting sections illustrating their char-

acter. Between six and seven hundred specimens of fossils were collected in this district by Mr. Ami. Mr. Coste states that the north-east part of sheet 113 has proved to be "of extreme geological complication. Fifteen large igneous masses and numerous smaller ones are to be found there in an area of about 500 square miles. They have cut the Archæan or primitive rocks to pieces and have completely metamorphosed large areas of the rock of that system, so much so, that I estimate these metamorphosed rocks (principally metamorphosed by injection) and the igneous masses to occupy about half the area of the Archæan of that part of the country. This great complication has made numerous traverses absolutely necessary in the parts examined, and though I have reason to think that these eruptions are less numerous to the west in the other parts of the map occupied by the Archæan rocks, it is nevertheless certain that there also many traverses will be required."

In consequence of these facts and the uncleared and sparsely settled character of the north-western part of sheet 113, it may probably be found advantageous to prepare this sheet with an accompanying report, for immediate publication, leaving the details of the intrusions probably yet to be discovered for future elaboration. Respecting the detailed map above referred to Mr. Coste writes as follows :

"Apart from the seven weeks already stated to have been spent by me this summer in the working out of sheet No. 113, the rest of my time, from the beginning of June until the middle of October, was devoted to the detailed map of the Madoc and Marmora mining district, as well as the whole time, during that period, of my assistant, Mr. White, being engaged in the topographical work. I am pleased to report that we have been able to complete the work, and that we have now a map of 40 by 40 inches on the scale of 20 chains to an inch, showing with a great many details the geographical, topographical and geological features. A complete transit and chain re-survey of the whole area under examination had to be undertaken, and was well and diligently performed by Mr. White, assisted by two men. As the work proceeded Mr. White had to plot it in the field to allow me to put down accurately my geological lines, the old township maps available being of no service. Mr. White is now engaged in replotting and reducing the whole summer's work, and the map to a scale of 40 chains to the inch. When geologically colored this map will clearly prove the close proximity I have referred to of the iron ores and auriferous quartz veins to the igneous masses and dykes cutting the Archæan, thus giving the key for further discoveries of economic importance in the Archæan rocks which cover so large an extent of country in Canada; besides being a guide for the district itself not only of what has been done towards the development of these mineral resources, but also of what may be expected and of where new work and researches should be directed. It will further show at a glance the very uneven and undulating surface of the Archæan rocks at the time the Cambro-Silurian sea invaded that country, and the great amount of valley erosion effected since the time the sea receded."

In December Mr. Coste spent about ten days in visiting some points in the province of Quebec from which additional particulars were required for the purpose of completing information in regard to mineral statistics, and as the compilation and preparation for publication of these statistics for the current year will now be a first charge on his time, his detailed report on the Madoc and Marmora region may not be ready for publication for some months, though it is anticipated that it will form a portion of the next annual volume.

Mr. Coste's field work was begun the 21st of May, and concluded on the 16th of October.

Expenditure \$1,936.29.

Mr. R. W. Ells, in the following preliminary report of his work in the Eastern Townships, has included a number of details bearing specially on the asbestos industry, which it seems important should be made immediately available.

"The work of the past season embraced the further examination of that portion of the Eastern Townships lying to the east of Lake Memphremagog, Richmond and Arthabaska, and extending thence to the Maine boundary, with the view of completing in greater detail the S.E. quarter sheet of the map of the province of Quebec. For the

purpose of better elucidating the somewhat complicated structure of this section over 2,000 miles of roads were carefully surveyed, the settlements of the last dozen years having opened up a large tract of country which had been almost entirely inaccessible to previous explorers, and enabling us the more readily to decipher and determine the outlines of the various geological formations. In this work I was ably assisted as in former years by Mr. N. J. Giroux.

"The latter part of the season was chiefly devoted to an examination of the principal mining areas, among which, from its great economic importance, special attention was directed to those localities where asbestos mining is now carried on.

"Highly important discoveries of graptolites at two points have necessarily led to a new and somewhat extensive re-arrangement of the several formations in the area in question, more particularly as regards the distribution of the Silurian (Upper Silurian) rock. Thus, by reference to the general map of 1866, it will be noticed that two very extensive areas of what were then regarded as of this age are depicted, the one extending northerly from the vicinity of Lake Memphremagog into the township of Ham, with a breadth of some twenty miles or more, while the second and of still larger area embraced the greater part of the country lying east of a line N.E. from Lennoxville and extending to the boundary of Maine. During the season of 1885, the necessity for correcting the boundaries of this system was noted, but no precise palæontological data could at that time be found which would fix the horizon of a great part of these rocks more definitely. In July last, however, while examining closely the country about Lake Memphremagog in company with Mr. H. M. Ami, considerable areas of black graptolitic slates on both sides of the lake were found to be very rich in organic remains (graptolites), &c., the exact age of which has not yet been ascertained, but which are very similar to many of those found at various points on the south side of the St. Lawrence, below Quebec, and which have been determined to be of Cambro-Silurian or Ordovician age.

"As regards the distribution of the Silurian (Upper Silurian) slates and limestones it has been found that these rocks are, for the most part, confined to limited areas and patches which have escaped denudation, and now rest unconformably upon great series of black slates and grey sandstones of presumed Cambro-Silurian age. These patches occur principally at Lakes Memphremagog and Massawippi, Stoke Centre and North Stoke, Lakes Aylmer and St. Francis and the Chaudière River, between the Famine River and the village of St. George, Beauce. Fossils (corals, &c.) are found at many points throughout these rocks, which range from the Niagara to the base of the Devonian. Their unconformability upon the underlying slates is, however, well defined at several observed points. The relations of the crystalline schists and other associated rocks of the mineral bearing belt have also been again carefully studied by detailed surveys, and it is hoped that the additional facts which have been obtained during the past season will, when plotted, assist in satisfactorily establishing their true position as regards the graptolitic black slates with which they are intimately associated. This work will be done during the coming winter when the final results will be duly presented.

"The various mountain masses, such as the Owls' Head, Orford, Ham and Bull Mountains, north-west of Lake St. Francis, all apparently belong to one era and form a disconnected chain of eruptive peaks which extend north-easterly for nearly 100 miles.* Their intrusive and eruptive character and comparatively recent age is clearly established by their action upon the black graptolitic slates which flank them and which are in many cases highly altered along the contact, the rock being in places changed to a true porcelain. Like these also they give off dykes into the surrounding slates and sandstones, with which are also intimately associated the

* This is the belt of rocks which I have elsewhere described and mapped as the Volcanic Group, or the upper division of the so called "Altered Quebec Group," at the same time I stated that these rocks might be of lower palæozoic (Cambrian) or of pre-palæozoic age. I cannot concur in the view above expressed that they are comparatively recent. They are certainly older than the Levis formation while the black graptolitic slates on the south-eastern side of them are certainly newer.—A. R. C. S.

great areas of serpentine, which have, during the last half dozen years, come into marked prominence as being the country rock of the valuable mineral asbestos.

"The various mining industries carried on at several points are in some cases marked by a decided increase in the output of raw material. The new system of mining returns will, it is hoped, eventually furnish a great amount of valuable information, and it is highly gratifying to find, in all cases, such a willingness on the part of mining men to assist in every way the collection of mineral statistics.

"The principal mining industries at present carried on in the section embraced in the season's work are:—

The slate quarries of Rockland and Danville—the latter lately reopened—while the former, by marked improvement in plant, is also rapidly increasing its output.

"The copper mines of Capelton, also showing a marked increase in output."

"The asbestos or crysotile mines of Thetford, Coleraine and Wolfestown and the gold mines of Ditton, and the Chaudière."

"As regards the latter industry, it is to be regretted that no returns can apparently be procured as to the amount of gold annually obtained from the Ditton gold field. The area being entirely in private hands, over which the local government has no control, no royalties are paid and no definite data can be had. There is no doubt, however, that a very large amount of gold has been found in this section and that the prospects for profitable workings are excellent.

"In the Beauce district work is being carried on in the Cumberland stream, a branch of the Famine, by Captain Richards; and on the St. André, near St. George, by the St. Onge Company. The returns from the former are very encouraging, but at the latter some further difficulty has been found in reaching the gravels of the old river channel, though gold is taken out in small quantity.

"The mining of asbestos is carried on at several points along the line of the Quebec Central railway, viz., at Thetford, Black Lake, Coleraine and Belmina. Some work has also been done near Coleraine station. Near Danville, four miles from the Grand Trunk railway, a mine of considerable extent has been operated for several years. As this industry has already grown to large proportions and bids fair to become one of the most important in the Dominion, a brief description of the various asbestos properties, its mode of occurrence, and some facts bearing on the future of the industry may be of general interest.

"The various companies engaged in mining asbestos at Thetford are King Bros., the Boston Asbestos Packing Co., Johnston & Co., and Ward Bros.; while at Black Lake and Coleraine are situated the mines of the Anglo Canadian Co., Frechette's and the Lionais Martin or Scottish Canadian Company's property. These all lie along or near the line of the Quebec Central railway which crosses the property at Thetford, while at Black Lake it is from a quarter to half a mile distant from the workings. At Belmina which is about four miles from the railway at Coleraine station, a small force of men, from six to eight, have been engaged for several years, merely on exploratory work on property owned by Mr. John Bell, of London, England. With a view of acquiring more definite information concerning this valuable mineral a somewhat detailed examination of all these properties was made in order to render assistance, if required, to any parties interested in this industry.

"All the asbestos mines in the Eastern Townships are situated on portions of the great serpentine belts which extend in tolerably direct lines, though with many breaks, north-eastward from the Vermont boundary for some distance beyond the Chaudière River. Further east these peculiar rocks present large areas in the Shick-shock Mountain Range, which extends through the northern portion of the Gaspé Peninsula in rear of Ste. Anne des Monts, and further east on the lower part of the Dartmouth River. Though indications of asbestos are found at most points throughout the whole serpentine formation, the developments of this mineral appear, in so far as yet known, to be greatest in the areas about Thetford and Black Lake and near Danville, though there is no apparent reason why it should not be found in paying quantity at other points, and it is probable that subsequent exploration will largely extend the area where profitable mining operations can be carried on.

"The serpentines, without going into any detailed account of their mode of formation, may be stated to be intimately associated with masses of dioritic or doleritic rocks, of certain varieties of which, rich in olivine or some allied mineral, the serpentine is in many cases doubtless an alteration product. The serpentines are also frequently associated with masses and dykes of whitish rocks, often composed entirely of quartz and felspar, but at times with an admixture of black mica, forming a granitoid rock. They occur generally not far from the axes of certain anticlinals which exist in the group of rocks designated the altered Quebec Group by Logan. (See foot note ante.) The asbestos traverses the serpentine in veins, often irregular, and which range from mere threads to a thickness of three and even in some case of six inches, in all of which the fibre of the vein is, unless affected by the dislocations of the containing rock, at right angles to the sides of the fissure. The rock is in many cases somewhat impure from the admixture of grains or small irregular veins of chromic iron, which break the continuity of the fibre in the vein and require the mineral to be carefully "cobbed" in order to separate these impurities. The veins at or near the surface are also affected by the infiltration of water by which the asbestos is discolored and its value correspondingly reduced. This is especially noticeable in areas where the surface serpentine is shattered, either by the action of weather or other causes, and this discoloring ceases as the rock becomes solid. As a rule the veins increase in value or quality of fibre as lower depths are reached. Veins are not however continuous; the size frequently varies, and like all mineral veins they are affected by faults or slides which often cut off, completely, a valuable working face. In such cases the slickensided character is very marked; sheets of impure or imperfect asbestos with long coarse woody fibre lying along the lines of fault. The veins have often the aspect of true segregation veins, and the containing walls often change their character for a distance of half an inch to three inches on each side of the vein. The theory of their formation is however as yet an open question.

"Asbestos mining was commenced at Thetford in the year 1878, by what is now known as the Boston Asbestos Packing Company. The demand at that time was exceedingly limited and considerable difficulty was at first experienced in finding a market. The output for that year did not exceed 50 tons, but its value was soon ascertained and explorations on the serpentine belt at this place resulted in finding asbestos in workable quantity over a considerable area.

"The Thetford River appears to mark the western limit of the serpentine on these properties, the rocks on the other side of the stream being altered slates and sandstones. To the east of the railway which cuts directly across the area the serpentine forms a knoll with an elevation of about 90 to 100 feet above the track. All the works are confined to this portion of the area and consist of open cuts in the face of the hill, nothing apparently having yet been done to ascertain the value of the area between the railway and the river."

"The quality of the asbestos at all the four mines at this place may be stated as excellent. The fibre is fine and readily worked and the veins are, for the most part, especially in the lower cuts, comparatively free from chromic iron or other impurities, reaching a width of from three-quarters of an inch to four inches, though in some, notably the quarry of Johnston & Co., veins of five or six inches are observed. The fibre in these large veins is not however of such good quality, in so far as yet worked, as that found in those of less size, and veins of one and a half to three inches give as good material as can be wished. Numbers of such veins yielding fibre which ranks as extra first quality are found in all the mines at this place. In some of the cuts these appear as a perfect interlacing network in the surrounding walls and can be counted by the dozen. While all these properties may be said to be about equally productive that of the Boston Company may be especially mentioned both for the amount of its output, which will probably equal that of the three others combined, as well as for the excellent way in which the property has been developed by its experienced manager, Mr. Thomas Sheridan, with a view to successful future operations, and also as illustrating the remarkable improvement in the quality and increase in the quantity of the fibre as the depth increases; a feature clearly established at all the mines, not only in this vicinity but also at Black Lake.

"The profitable output of the asbestos is at present apparently only limited by the demand. The amount extracted since the commencement of operations here may be briefly stated thus:—

"Boston Asbestos Packing Company, opened 1878, output for 1886, 700 tons. Total output to end of 1886, 30,000 tons.

King Bros., for 1886, say 250 tons, adjoining to north, total since 1881, 850 tons. Irving-Johnston Company, for 1886, say 400 tons, opened since 1879, total 2,500 tons.

"Ross-Ward Bros., one quarry, three years only, say 400 tons.

"The cost of extraction varies in different localities and depends upon the amount of barren rock encountered, which owing to the action of faults is greater in some cuts than others. It may however be safely put down at \$20 to \$25 per ton.

"The prices obtained for the asbestos at points of shipment on railways range from \$50 to \$55 per ton for second quality to \$80 or even \$100 for first, a considerable portion of that taken from the lower cuts realizing the latter figures. The markets are Great Britain, Germany, Belgium, the United States and Italy.

"The majority of the veins worked range from three-fourths of an inch to two inches and a half. The material is blasted out, carried to the dump, broken up and cobbled by boys and old men, who grade the asbestos, this latter depending upon the color as well as purity of the fibre, with due regard to its length. The wages paid for laborers in the quarry range from \$1 to \$1.10 per day, and for boys and cobblers, 50 cents.

"The comparison of the cost of extraction with the value of the raw material shows a very good margin for profit. The works at this place are, however, carried on, for the most part, during the six months of summer and autumn only, since it has not as yet been found advantageous, in view of the limited market, to undergo the inconvenience and extra expense of continuing operations during the winter. As the market enlarges, however, the mode of working will doubtless adjust itself to the demand. The properties worked at Black Lake are situated on the west side of a steep ridge of serpentine which rises to a height of about 900 feet above the waters of the lake itself. The three areas are contiguous and from a fourth to a half mile east of the railway. The work is carried on by open cuts in the face of the hill, in all of which veins of excellent asbestos are disclosed, ranging in size up to four inches. The fibre is, in most of these, somewhat discolored from the presence of water which penetrates the shattered serpentine, and, as a consequence, the greater portion of the output grades as second; but in most of the openings the solid rock is now reached, and the quality of the asbestos is rapidly improving. These mines have not been in operation so long a time as those of Thetford, but the output, which is as follows, shows readily the growing importance of this locality:

"The output of the Anglo-Canadian (formerly Hopper's mine), for 1886, may be stated at 550 tons, and total output for the four years, 1,500 tons.

"The Frechette mine has been at work only one year, with an output of about 200 tons.

"The Lionais-Martin mine, now the Scottish-Canadian Company, has done a large amount of exploratory work. Its estimated output for 1886 may be stated as 250 tons, with a total from the commencement of, say 700 tons.

"The cost of mining here varies but little from that at Thetford, and may be stated as averaging \$.25 per ton.

"In the vicinity of Black Lake several other areas occur, in which the exploratory work done, though not very extensive, shows indications that fully warrant the statement that a valuable and profitable output may be expected. These properties are known as the Reed and Hayden properties, and are situated on Lots 27 and 28, Range B, Coleraine. In various open cuts in the side of the hills numerous veins are disclosed, ranging upward to a width of two and a half inches, with surface indications apparently in no way inferior to those of the adjoining properties now being worked at this place, or even of those of Thetford, not only as to number and size of veins but also as to quality of fibre. These indications appear

at many points on both the Hayden and Reed properties, which embrace a total of 200 acres. Between these and Caribou Lake the serpentines extend as an apparently continuous ridge, and show at intervals very good indications of asbestos, but this portion has not as yet been explored to any extent, and but little can be said from actual examination of the value of this section of the serpentine belt, though that it will be found equally productive with the adjoining areas seems reasonable.

"In the vicinity of Coleraine station serpentine also occurs, but the main ridge, extending south-west from Black Lake, keeps to the north-west about one mile and a half, where it forms a conspicuous hill feature. This has been but little examined, but an opening was made on its south-east extremity during the present year by Mr. Kennedy, disclosing the presence of a number of veins of asbestos, one of which had, near the surface, a thickness of nearly four inches. Sufficient work was not done to determine the persistence and value of these veins. An interesting feature in connection with this opening is the presence of mica in considerable quantity in direct contact with the asbestos, a feature not as yet noted at any other point.

"The asbestos area of Wolfestown is situated on the north-east extremity of a serpentine ridge, which extends south westerly, with several interruptions from the road leading from Coleraine station to Wolfestown, to the vicinity of Lake Nicolet. It is owned by Mr. John Bell, of London, Eng., and though a considerable sum of money has evidently been spent on this property it has been largely in the way of explorations. The surface indications, while not equal to those of Black Lake, yet show at several points numbers of veins, some of which reach a thickness of one and a half and even two inches. Only a small force of men is employed, and the property cannot yet be said to be fairly proved. Considerable deposits of chrome iron are found in the hills on this area, which embraces 600 acres. At present it would be exceedingly difficult to give any decided opinion as to the merits of this property. A very fair showing of workable veins has been exposed in the upper part of a deep cut which it is now proposed to intersect at a considerably lower level. Should the same rule of increase which holds at Black Lake and Thetford apply here, there should be good paying ground when the lower level is driven in past the capping of barren rock, provided the veins already disclosed are not cut off by faults, whose presence is noted here as at other points. The total amount of asbestos taken from the Belmina area is about twenty-five tons.

"In addition to the properties already described the only other point where this mineral is worked successfully is on Lot 9, Range 3, Shipton, about four miles from Danville on the Grand Trunk railway. The outcrop of the serpentine here is quite limited, with steep sides all round, and contains a number of veins of asbestos, mostly of small size though the quality of the fibre is good. Faults have affected the value of this property considerably, some very good veins with a thickness reaching two inches having been cut off completely at a depth of 50 feet from the surface. The output, however, is considerable, for the year ending 28th August, 1886, being 455 tons, but from various causes it is at present much less, the mine not being worked to its full capacity.

"It will be seen from the facts here presented that the asbestos interests of the province are very important, and judging by the ratio of increase for the last six years will soon assume large proportions. The demand is annually increasing as new uses for the raw material are being found, and from the prospects presented not only at the mines already opened, but in those areas contiguous and which appear equally rich, the supply is practically limitless.

"During the past year attention was directed to the deposit of marble situated near Marbleton, in the Parish of Dudswell. This was described by the late Sir Wm. Logan in the *Geology of Canada*, 1863, p. 827. A great variety of marble is here presented, some of which are very fine, notably a black ground, with veins of ochre yellow. Though the deposits of marble in the vicinity have been extensively used for some years for the manufacture of lime, the desirability of utilizing the finer grades as marble was such that a company was formed during the past year for this purpose. The ground has been cleared and a channelling machine set to work. The extent of

the present quarry is about forty feet square. The black and gold variety is interbedded with others of dove-grey and variegated shades, all of which present a fine appearance when polished, some bands entirely composed of fossils (corals) notably so. The rock bids fair to be sufficiently solid to extract valuable blocks of large size in the second cut, and it is the intention of the company to erect in that case sawing and polishing machinery for its manufacture.

The work of the season began on the 17th of May, and extended to the 1st of November.

Expenditure in connection with work, \$1,560.

At the end of July Mr. H. M. Ami was instructed to join Mr. Ells in the Eastern Townships for the purpose of assisting him in collecting fossils and examining the various fossiliferous localities which had been discovered, with the view of fixing the age of parts of the rock series of the district. Messrs. Ami and Ells together obtained about five hundred specimens from various places near Lake Memphremagog, in Stukely, Stoke and Dudswell; along the Chaudière River, Quebec City, Montmorency and the Island of Orleans.

Rev. Professor J. A. K. Laflamme having consented to continue the work previously carried on by him in connection with the accurate definition of the boundary of the Cambro-Silurian on the Archæan to the north of the St. Lawrence, and the areas respectively occupied by the various subdivisions of the formation, sketches the result of his labors as follows:—

"I have traced on the map with as much precision as possible the limits of the Laurentian and Cambro-Silurian formations between Quebec and Three Rivers, as well as the several divisions of the Cambro-Silurian which are found in this part of the country. I have, however, unfortunately, been unable to complete the stratigraphical study of the region immediately surrounding the city of Quebec.

"The geological map received from Ottawa for use as a basis of work was found exact in its principal lines. Some slight errors which I have noted have been carefully corrected, and will be indicated on the map which will be submitted with my report.

"Certain facts which appear worthy to be remarked are as follows:—

"(1.) The discovery of some small deposits of apatite in the Canton de Caxton merit special attention, as it is not impossible that more important deposits will be found in the future, as the Laurentian gneiss of the neighborhood is traversed in different directions by veins of crystalline calcite rich in mica and pyroxene.

"(2.) The great thickness and quantity of sand which occurs on the banks of the St. Maurice renders the observation of the exact limits of the different geological formations impossible, particularly as regards the boundary of the Utica and the Trenton limestone. The sand contains a great quantity of ferruginous matter, giving rise to abundant deposits of limonite wherever the surface is occupied by swamps. Thus in this part of the country we find the most ancient iron furnaces of Canada, several of which are now, however, not in operation, owing to the scarcity of fuel.

"(3.) The Utica shales preserve there one of their distinctive characters in giving rise to strong and highly saline, mineral springs, the therapeutic value of which has long been known.

"(4.) The same shales with the subjacent Trenton limestones produce considerable quantities of light carburetted hydrogen, almost pure, and capable of being utilized at several places very profitably. One in particular of these flows of combustible gas occurs quite close to the old forges, abandoned on account of the scarcity of fuel, and there, it appears, all the conditions exist which would justify boring operations with the object of augmenting the flow of gas, for the purpose of resuming the smelting operations. The boring made at St. Grégoire leads to the belief that the gas is stored principally in the Utica shales. If this be the case it would be necessary only to sink wells through the thick bed of clays which cover this formation here to produce an abundant flow of gas.

"(5.) The Trenton limestones have a great development at St. Alban, where are found the well known quarries which yield the best building stone of the province of Quebec. The limestone is crystalline and fossiliferous. The quarries yield annually from four to six thousand toises of stone.

"(6.) The study which I have made of the immediate vicinity of Quebec, though superficial, leads me to the belief that there are on the northern side of the rock mass of this vicinity tongues of Utica shale. These would be somewhat analogous stratigraphically to those shown by Sir W. E. Logan's section of the Island of Orleans. It appears to me impossible to class as Trenton the whole of the exposures comprised between the left bank of the river and the heights of Beauport, Charlesbourg and Lorette.† There is quite close to the edge of the Laurentian a band of variable width of Trenton limestone, but the remaining space is occupied by shales very like those which are again found to the south-east of the Montmorency Fall between the fall and the river."

Prof. L. W. Bailey was again occupied during the summer in the geological survey of New Brunswick, with the object in view of completing the sheets of the geological map yet remaining unfinished. Prof. Bailey was personally assisted during the season by Mr. J. W. Bailey. His preliminary account of his work, with that of Mr. W. McInnes in the same province, is given below.

"In accordance with instructions, my own attention was directed chiefly to the study of the Silurian system of northern New Brunswick, with a view to the determination of the succession of its rocks and their relations to the formations above and below it. With this object in view, examinations begun in the previous year on the northern side of the Silurian basin where it comes into contact with the rocks, supposed to be of the age of the Quebec Group, in the vicinity of Lake Témiscouata, were renewed and extended both easterly and westerly, while an examination was also made of the neighboring portions of Aroostook county, Maine, where the same Silurian rocks are associated with others which have been supposed to be Devonian. The result of these examinations was to show a general parallelism between the succession of rocks as seen on Lake Témiscouata, on the northern side of the Silurian tract, with that previously made out on its southern side, on the Beccaguimic River, in Carleton; while portions of the rocks of Aroostook county, previously regarded as Devonian, would seem also to occupy a like position in the Silurian system. The final determination of these points, however, is largely dependent upon the examination of their contained fossils. Of these somewhat numerous collections were made on Lake Témiscouata, on the Tuladi and Squatook Rivers, at Squaw Lake, Maine, and at Ashland and along the course of the Aroostook River in the same State. These are now in the hands of Mr. Whiteaves and Mr. Ami.

"The work in the Témiscouata region has already sufficed to show, irrespective of fossils, that a considerable area about the lake of that name, regarded by Sir W. E. Logan as of the age of the Quebec Group, is at least as recent as Silurian, while other areas to the north, referred by Mr. Richardson to the Silurian, really belong to the more ancient Cambro-Silurian system. A complete exploration of the region intervening between the Témiscouata Portage Road and Lake Metapedia on one side, and between the same road and the Chaudière district on the other, is required before the real structure of this region can be fully understood.

"The especial object of the work carried on by Mr. McInnes was the completion of the information necessary for sheets No. 2 south-west, and 2 north-west of the geological map of New Brunswick, on which Mr. McInnis reports as follows:—

"I left Ottawa on the 3rd of June and arrived at Fredericton on the 9th, spending three days, in passing, in a brief examination, in company with Mr. Ellis, of the

† This is quite true, but there seems no great difficulty in considering them to represent the Trenton group, i.e., the Chazy, the Birds-eye, Black River, Trenton, Utica and Hudson River formations. In any case the fossils of the Citadel Hill rocks ally them more closely to the Trenton group than to the Levis, the graptolitic fauna of which belong to a much older horizon. The main point now to be decided is whether the Citadel Hill rocks are below or above the Trenton and Black River limestone formations.—A. R. C. SELWYN.

region about Lake Témiscouata. After a week in Fredericton, occupied in making tracings of Crown Land plans and in completing arrangements for the season's work, I started for the upper St. John district on the 14th of June. Arriving at Andover, advantage was taken of the high water prevailing in the streams to make a survey by micrometer telescope of the right hand branch of Tobique River, of Campbell River and of Trousers, Long, and Serpentine Lakes; in descending the Serpentine, a sketch survey of that stream was also made. The country passed through on this exploration lies mostly within the pre-Cambrian and intrusive granite areas, the latter extending from Little South-West Miramichi Lake across to a point about midway between the outlet and inlet on Long Lake, and the former occupying most of the district between the granite and the main Silurian area.

"The region in general is very rough and broken with high hills and ridges, and the surface often thickly strewn with large blocks and boulders of the underlying hard crystalline rock. The forest growth is chiefly black spruce and fir, mixed with cedar along the watercourses, and with scattered pine, birch, mountain ash, &c. What is probably the first representative, yet noticed in New Brunswick, of the Oriskany sandstone, so common in the neighboring State of Maine, occurs near the confluence of the Don and Campbell Rivers. A broad band, three miles or thereabouts in width, of buff weathering dolomitic sandstone, with fossiliferous layers, crosses the river at this point. This seems to be an isolated patch lying upon the older rocks which has escaped the general denudation.

"In the latter part of July two weeks were spent in making odometer surveys of the roads between Edmundston and St. Francis in Madawaska county, and between Edmundston and Notre Dame du Lac, Témiscouata, chiefly for the purpose of topographical detail. During August a micrometer survey was also made of Lake Témiscouata, and a sketch survey of Horton Branch of Tuladi River.

"The remainder of the season, September and part of October, was spent in exploring the region lying between the Tobique and Campbell Rivers by ascending the stream flowing into the Tobique from the south and by a paced survey of the portage road to Trousers Lake. This whole area is very hilly and rough, and presents a marked contrast to the rest of the valley of the Tobique below the forks, where the soft and calcareous character of the Silurian and Lower Carboniferous strata has produced a soil of great fertility with numerous fine alluvial flats and islands which, when cleared of the large elms and balsam poplars with which they are generally wooded, form nice meadow lands. Extensive beds of gypsum, which occur near the summit of the Lower Carboniferous outlier, add to the value of the lands.

"Collections of fossils were made from the Silurian beds on Campbell River and Riley Brook, which are in the hands of the palæontologist of the Survey for identification.

"Leaving Fredericton on the 20th October after a few days spent there in packing and labelling specimens, &c., I arrived in Ottawa on the 22nd and resumed work in the office.

"During the summer about 200 miles of lakes and streams were surveyed with the Rochon micrometer telescope, 100 miles of roads with the odometer, and about 70 miles of rough roads and streams by pacing and sketch surveys."

Expenditure in connection with field work \$1,579.67.

Mr. R. Chalmers left Ottawa on the 1st June, with instructions to work out in detail the surface geology of the districts comprised within the two quarter sheet maps, 2 N.E. and 6 S.W., New Brunswick. Mr. Chalmers' preliminary statement with regard to the work carried out is as follows:—

"Certain sections included in sheets 3 S. E. and 3 S. W., the surface geology of which was investigated during the previous summer, had first to be further examined to obtain additional data to complete these maps, and accordingly a part of June was devoted to this object. On finishing this I started on a canoe trip to explore Shippegan and Miscou Islands and the adjacent mainland, and then ascended the Nepisiquit River to the limit of the map. Thence I crossed over to the North-West Miramichi River, and examined the inter-

vening country as well as portions of that lying north of the Nepisiquit as far as time would permit. The general elevation and topographic features of this interior region were noted, and some points of interest, relative to the peculiar character of the Nepisiquit as a drainage channel, observed. Immediately thereafter I went up the North-West Miramichi from Newcastle, and on the return trip ascended its affluent, the Little South-West, some distance. Interesting observations on the country drained by these rivers, and on the terraces and intervalles skirting them, were made. Subsequently another canoe trip was made down the Miramichi Bay and the coasts and islands examined as far as Portage Island and Escuminac Point. These explorations occupied my time till about the middle of September. The remainder of the season was devoted to the study of the character and distribution of the deposits in those sections lying at a distance from the coasts and rivers and in mapping the forest-covered areas. All back settlements and places accessible by roads of any kind were visited. The old Indian camping grounds at Tabusintac and Derby were also explored and some relics found.

"The investigations of the season have resulted in showing a much wider extension of pre-glacial gravels and sands than was hitherto supposed to exist in New Brunswick. From the evidence afforded in numerous sections in different parts of the area under discussion it would seem that they must have formed a general covering of some thickness, especially upon the flat Carboniferous plain, and probably mantled the crystalline rocks of the interior as well, although the proofs of this are not so abundant. These gravels were no doubt considerably reduced in bulk previous to the advent of the ice age, by atmospheric erosion, especially on the latter tract, or wherever the country was hilly or had an uneven surface, and along the lines of drainage. Near the coast large areas are still covered by them, however, but overlain by stratified materials. Either the ice of the glacial period has passed very lightly over the tract, or it has been unglaciated, and was probably submerged during the greatest extension of ice.

"Some interesting facts were observed regarding boulder distribution. Blocks of granite, felsite, gneiss, diorite, &c., are abundantly strewn over the whole area examined. These together with the courses of striae show that the general ice movement, as stated in my preliminary report, Annual Report, 1885, page 566, was eastward or north-eastward from the higher grounds of the interior. Besides this, however, other and probably smaller local glaciers followed the valleys in different directions. The boulders of crystalline rocks met with below the 200 feet contour line do not now occupy the sites to which they were borne by glacier ice, but appear to have been shifted about by floating ice since on the shores of the receding post-Tertiary sea as they are found almost wholly on the surface.

"Within the Miramichi basin no marine terraces were found at a greater height than 150 to 160 feet above sea level, and it therefore seems probable that the post-Tertiary subsidence was hardly as great there as in the Baie des Chaleurs district.

"Regarding river terraces a number of facts were collected which serve to throw light on their origin and on the relation they bear to the rivers which formed them. The Little South-West Miramichi, the most rapid river in north-eastern New Brunswick, has the highest and finest terraces.

"Close attention was given to the agricultural character of the country examined. Large intervalles and considerable tracts of good uplands were seen along the Miramichi Rivers.

"Observations were also made regarding the forest growth. The approximate limits of the burnt forest areas, particularly that of the great Miramichi fire of 1825 were located, and the extent of country cleared and inhabited was likewise noted.

"Extensive beds of peat were observed at Point Escuminac, Tabusintac, Miscon Island and elsewhere near the coast. The bottoms of these seem now to be slightly below high tide level, and their thickness in some places is known to be upwards of 20 feet. They apparently owe their growth to proximity to the sea, where the conditions of temperature, moisture, &c., are favorable. Sand beaches, drift wood, and in one instance a charred log, were found at the bottom of these peat deposits.

"Beaches of blown sand are characteristic features of the coast along the Straits of Northumberland. They appear to have been produced by the action of the sea along a shallow, stationary coast margin. Under some of these rock, *in situ*, was seen nearly as high as sea level. A singular beach formation is now being thrown up at the north-east point of Miscou Island in which the bones of the walrus were found.

"The field work was brought to a conclusion on the 11th of November."

Expenditure in connection with field work, \$321.97.

Mr. Fletcher and assistants were engaged during the season in continuing and extending the geological work carried out by them in Nova Scotia in previous years. It was found advantageous to detach Mr. Faribault for the investigation of a separate district. The following summary of the work of both parties is presented by Mr. Fletcher, that portion referring to his own exploration having been supplied by Mr. Faribault:—

"To the westward of the district referred to in the Summary Report for 1885, page 20, surveys were made during the summer of 1886, so that a geological map can now be constructed of all that portion of Nova Scotia lying east of longitude 62° 30', and including the whole of Antigonish and Guysborough counties and part of Pictou and Halifax counties.

"Mr. Faribault was again put in charge of the work among the gold-bearing rocks of the Atlantic coast. Mr. Robert assisted me in Antigonish and Pictou counties, and was for a long time engaged in mapping out the plications of the Lower Carboniferous rocks and their relations to the metamorphic rocks of the hill ranges.

"The general distribution of the Carboniferous rocks over most of this area was described in the above mentioned Summary Report. Many additional details of structure have, however, been obtained, and the various basins into which the different sub-divisions can be separated have been carefully traced. The Carboniferous limestone runs in a narrow belt along the eastern shore from Antigonish to Morristown, and a patch of this formation occurs also at the mineral spring in Hallowell Grant; but the greater part of the Carboniferous rocks between Antigonish and Cape George, including the so-called coal mines of Malignant Brook, Hallowell Grant and other places in the neighborhood, belongs to the "Metamorphic Carboniferous," Horton or Basal conglomerate group. Underlying the Lower Carboniferous at McCara's Brook, is a small area of red and greenish slates and sandstones, apparently Upper Devonian, from which Mr. Weston obtained certain tracks and fossil plants. Beneath these lie the Silurian rocks of the well-known Arisaig shore, running in a narrow belt eastward to McNeil's Brook, and underlaid by Cambro-Silurian and perhaps older rocks. In addition to this Silurian area several others were found in the region in question. (1.) Two small patches on the sea shore at Cape George; (2) a small patch west of Vamey's Brook; (3) a long narrow basin in the deep picturesque valley along the railway from James' River to the west end of Marshy Hope; (4) a broader belt extending from Bailey's Brook to Avondale, thence up Barney's River to Kenzieville, thence along the telegraph road to Glenshee, thence to the St. Mary's road at McPherson's mills to join the area of pre-Carboniferous rocks shown on Sir Wm. E. Logan's and Hartley's map of the Pictou coal field, a large part of which, however, belongs to the underlying Cambro-Silurian; (5) a small patch at Moose River; (6) the broken basins north of the East River of Pictou extending from the vicinity of Beaver Lake down stream towards Springville, and described by Sir J. W. Dawson in *Acadian Geology*, and by Dr. Honeyman in the *Transactions of the Nova Scotian Institute of Natural Science*.

"But by far the greater part of the districts underlaid by pre-Carboniferous rocks is occupied by rocks older than Silurian, those containing the iron ore at London-derry mines (probably Cambro-Silurian), and by a series of felsitic, mica, hornblende, chlorite, talc and other schists resembling those in the Cobequid Hills called Archæan by Mr. Ellis, but which have not yet been examined with sufficient care in Antigonish and Pictou counties to determine that they are not a part of the Cambro-

Silurian series. On the sea shore at Arisaig and Georgeville are exposures of very crystalline limestone and other rocks, which have been referred to the Archæan, but of which no more can be at present affirmed than that they form pebbles in certain conglomerates, which are apparently Cambro-Silurian.

"In the Cambro-Silurian strata only a few obscure fossils were found at McNeil's Brook, where also, as well as in the Malignant and Doctor's Brooks, deposits of red hæmatite, probably of great thickness and value, have been exposed in many places; but the want of a convenient shipping place has hindered the development of these ores. Iron has also been found in Barney's River, French River and other places. Small quantities of the precious metals are reported to have been found in the numerous quartz veins of the Cambro-Silurian rocks at Vamey's Brook, Bailey's Brook, Rights River, Malignant Brook, Georgeville and other places; but nothing to warrant the belief that they exist in paying quantity was seen by us.

"In addition to the coal found in the Lower Carboniferous as stated above, it has been sought, of course in vain, in the black Silurian slates of Arisaig, Kerrowgare and other places.

"Traces of copper and lead have been found in all of the formations above described, as at Arisaig, Moose River, Blue Mountain, and other places, but apparently not of economic importance. The innumerable veins, usually of white quartz, cut the Cambro-Silurian rocks as at Sutherland River, and seem to be invariably barren.

"Mr. Faribault was assisted during the season by Mr. M. H. McLeod, and part of the summer by Messrs. A. Cameron, G. B. Faribault and A. H. McLeod.

"The first four months were spent making a detailed topographical and geological survey of the country lying between the Liscomb and Sheet Harbor Rivers and the Atlantic coast. The country examined consists entirely of the gold-bearing rocks (lower Cambrian?) which are much less altered than those seen last year in the vicinity of the granite dykes south of West River, St. Mary's. No fossils, however, could be found in them. Some seven miles up Ecum Secum River, many Upper Silurian fossils were discovered in the drift, but whether they were carried from Antigonish county or belong to an isolated patch of the Upper Silurian in the gold-bearing rocks, could not be ascertained. Much attention was paid to the stratigraphy of these rocks with the view of ascertaining the position of possible new gold districts.

"The only gold mine now being worked in the region surveyed is the well-known Salmon River mine, where much work is still being done with very good returns. The following gold mines, not worked at present, were also examined:—Hattie's mine, quarter of a mile east of that at Salmon River, Harrigan Cove mine, Moose Head mine and Ecum Secum mine. Besides the quartz leads which have been prospected at various places and are known to contain gold, many quartz veins of very good appearance were also seen at the head of Moser's River.

"Over a month was employed in the latter part of the season in revisiting the country previously surveyed along the south shore from Liscomb River to Cape Canso, in order to obtain more definite information relating to the general structure of the gold-bearing rocks, the map and report of which will be ready for publication next spring. A large number of rock specimens, illustrating the alteration of the various strata as they come near the granite, was collected. Five hundred and thirty-eight miles of stream and 130 miles of roads were measured by Mr. Faribault, and many heights taken with the barometer.

"Field work was begun on the 2nd of June and continued till about the end of November."

Expenditure on exploration, under Mr. Fletcher's charge, about \$2,000.

PALÆONTOLOGY AND ZOOLOGY.

Under these headings Mr. Whiteaves reports that the systematic catalogue of the zoological specimens contributed by the Department of Fisheries to the Colonial and Indian Exhibition, of which mention was made in last year's report, has been revised and published in the shape of an octavo pamphlet of 42 pages, 1,000 copies of which have been distributed in London.

The study of by far the larger portion of the extensive series of recent marine invertebrata dredged or otherwise collected by Dr. G. M. Dawson and Mr. D. B. Dowling, in 1875, in the Strait of Georgia, Discovery Passage, Johnstone Strait and Queen Charlotte and Quatsino Sounds, as well as that of the whole of the marine fishes, birds and other vertebrates from the same region, has been completed, and a paper upon them, which is now in the printer's hands, has been read before the Royal Society of Canada at its last meeting. All the species of Foraminifera, Anthozoa, Echinodermata, Brachiopoda, Mollusca, Ophidia, Batrachians, birds and mammals, have been determined and labelled, and the duplicates made up into sets for distribution, as far as the time would permit. The Crustacea obtained in these dredgings have been sent to Professor Sidney J. Smith, of Yale College, and the hydroids and polyzoa to the Rev. Professor Hincks, of Leigh Woods, near Bristol, England, who have kindly promised to report upon them.

A paper entitled "Illustrations of the Fossil Fishes of the Devonian Rocks of Canada," which is also now in the press, has been prepared and read at the last meeting of the Royal Society of Canada. This paper, which is illustrated by five quarto plates, contains fuller descriptions than have yet been published of four out of the eight remarkable species discovered in 1880 and 1881 in the Upper Devonian rocks at Scaumenac Bay, Que., and the homologies of the Canadian *Pterichthys* or *Bothriolepis* are discussed at some length.

A considerable portion of the letterpress of Part II of the first volume of the "Contributions to Canadian Palæontology" has been written, and the lithographic plates required to illustrate it have been prepared. This report, which it is hoped will be issued early in the spring of 1887, will contain descriptions of the fossils, and more especially of the crinoids and blastoids, of the Hamilton Formation of Western Ontario.

A preliminary examination has been made of the large and interesting collections of Palæozoic and Mesozoic fossils made this year by Mr. R. G. McConnell in the Rocky Mountains, and of the Cambro-Silurian or Silurian fossils collected by Mr. A. P. Low on the Fawn branch of the Severn River.

The skeleton of the Harp Seal obtained by Mr. T. C. Weston in 1861, from the Post-Pliocene clays of Montreal, and that of the White Whale or Beluga (*Delphinapterus catodon*) found in deposits of similar age at Cornwall, Ont., in 1870, have been skilfully articulated by Mons. Jules F. D. Bailly, and now form conspicuous objects in the upper flat of the Museum.

Sixteen additional specimens of mammalia, six of which are seals, and thirty of birds, have been mounted and placed on exhibition during the year, and the number would have been greater but for the fact that Mr. Herring's time, up to the first of April, was occupied in cleaning and remounting a large number of specimens of birds, &c., which were sent to the Colonial and Indian Exhibition. All the species added to the Museum during the year in the department of zoology, a list of which will be found on pages 33-37, have been examined and determined, and the whole series of mammals and birds now in the cases has been re-labelled and re-arranged. Some progress also has been made in the labelling and classification of the numerous specimens of fossils and recent invertebrates that have also been lately added to the Museum.

The number of letters written is 270, many of which partake of the nature of "reports."

Most of Mr. T. C. Weston's time has been spent in Museum work, in the classification and arrangement of the Carboniferous, Cretaceous and Laramie fossils,

in conjunction with Mr. Ami, in labelling and planning the arrangement of specimens of gold, *Eozoon*, &c., selected for transmission to the Colonial and Indian Exhibition, and in field exploration.

During the months of July, August and September, he made large collections of fossils and lithological specimens from the Carboniferous, Devonian and Silurian rocks of Nova Scotia and Cape Breton. A list of these fossils, with other information, will be embodied in a forthcoming report by Mr. Hugh Fletcher.

Mr. Weston has also visited Côte St. Pierre, where he has collected as large a series of specimens as possible of *Eozoon* for exhibition in the Museum and for distribution.

Mr. H. M. Ami has been occupied chiefly in the classification and labelling of fossils in the Museum. All the species enumerated in Mr. Whiteaves' recently published Report on the Invertebrata of the Laramie and Cretaceous rocks of the Bow and Belly Rivers and adjacent localities in the North-West Territories, and the fossil plants of the "Jurasso Cretaceous," Cretaceous and Laramie rocks of the North-West Territories, described by Sir William Dawson in 1885 and 1886, have been labelled, classified and placed upon exhibition in the Museum. A number of fossils from the Devonian rocks of the North-West and Hudson's Bay Territory, and the whole series of fossil plants from the Carboniferous formation of New Brunswick, Nova Scotia and Cape Breton, in the possession of the Survey, have also been labelled and classified.

Collections of fossils made by Professor L. W. Bailey, Messrs. Hugh Fletcher, W. McInnes and W. H. T. Reed, at various localities in the provinces of Quebec, New Brunswick and Nova Scotia, consisting in all of some eight hundred specimens (some of which appear to belong to species not previously represented in the Museum) have been examined with a view to determine, as far as possible, the exact geological horizons of the rocks from which they were collected. The Palæozoic fossils collected by Mr. R. G. McConnell in 1885 from eight different localities in the Rocky Mountains, and in the early part of the season of 1886 from the Bow River Pass, have also been examined and provisional reports thereon prepared. The Cambro-Silurian fossils collected by Mr. F. D. Adams in 1885 at Lake St. John, and those collected by Colonel Grant on the Island of Anticosti in the same year (which latter were sent to the Colonial and Indian Exhibition), have been studied, and the species determined.

Collections of duplicate fossils, &c., have been sent to the Redpath Museum at Montreal, to the Museums of Queen's University, Kingston, and of the University of Fredericton, N. B., also to those of the Agassiz Association of Montreal, and of the public schools at Berlin and Blair, Ont.

During two months of the year Mr. Ami has been engaged in the field in the examination of fossiliferous rocks at various localities in the Eastern Townships of the province of Quebec, and in Central Ontario, with the object of determining their exact geological horizons, as already stated on pages 19 and 26.

The following collections have been received during the year from members of the staff or gentlemen engaged in the work of the Survey:—

R. Bell:—

- One Harp Seal (*Phoca Grænlantica*) from Blanc Sablon.
- One Peregrine Falcon (*Falco communis*) from Cape Chudleigh, Labrador.
- One Gyr Falcon (*Falco sacer*) also from Cape Chudleigh.
- One King Eider (*Somateria spectabilis*) from Ashe's Inlet, Hudson's Strait.
- One Long-tailed or Buffon's Skua (*Stercorarius Cephus*) from Cape Chudleigh.
- One Glaucous Gull (*Larus glaucus*) from Resolution Island, Hudson's Strait.
- One Ivory Gull (*Pagophila eburnea*) from Resolution Island.
- One Kittiwake Gull (*Rissa tridactyla*) from Cape Chudleigh.
- One Fulmar Petrel (*Procellaria glacialis*) from Resolution Island.
- Two Black Throated Divers (*Colymbus arcticus*) from near Cape Digges, Hudson's Bay.

Thirty-six specimens of fossils from the Albany River between its mouth and the forks.

Twenty-one specimens of fossils from the Attawapishcat River.

R. G. McConnell:—

(From the Rocky Mountains near the line of the Canada Pacific Railway):—

One specimen of the Hoary Marmot or "Siffleur" (*Arctomys pruinosus*) from mountains near Devil's Head Lake.

One specimen of the Rocky Mountain variety of Parry's Marmot (*Spermophilus Parryi*, var. B.) from the base of Castle Mountain.

One specimen of the Missouri Ground Squirrel (*Tamias quadrivittatus*) from the base of Grotto Mountain.

One Red Squirrel (*Sciurus Hudsonius*, var.) from the base of Wood Mountain.

One Virginian Owl (*Bubo Virginianus*) from Gap Siding, C.P.R.

About 700 specimens of Palæozoic and 100 of Mesozoic fossils.

J. B. Tyrrell and D. B. Dowling:—

(From the Upper North Saskatchewan and its vicinity.)

One Coyote or Prairie Wolf (*Canis latrans*) from Egg Lake.

Two Badgers (*Taxidea Americana*) one from Sounding Creek and one from Dried Meat Lake, near the Battle River.

One Striped Gopher (*Spermophilus tridecemlineatus*) from Nose Creek.

Two Northern Pocket Gophers (*Thomomys talpoides*) from near Edmonton.

One specimen of the western variety of the White Footed Mouse (*Hesperomys leucopus*, var. *occidentalis*.)

One specimen of Cooper's Shrew (*Sorex personatus*) from Pigeon Lake.

Fifty-two skins of Birds, including three Magpies (*Pica melanoleuca*, var. *Hudsonica*), one Swainson's Buzzard (*Buteo Swainsonii*), two Avocets (*Recurvirostra Americana*), one Wilson's Phalarope (*Steganopus Wilsoni*), one Black-tailed Godwit (*Limosa Hudsonica*), two Willets (*Totanus semipalmatus*), two Upland Plovers (*Actiturus Bartramius*), one White Pelican (*Pelecanus trachyrhynchus*), and two Sooty Terns (*Hydrochelidon lariformis*).

Eggs of Swainson's Buzzard, Avocet and Upland Plover.

One hundred and twenty-five butterflies, and a small series of fresh-water shells.

About four hundred specimens of Cretaceous and Tertiary fossils.

T. C. Weston:—

Six hundred and eighty specimens of fossils from various localities near Arisaig, N.S.

Twenty-four specimens of fossils from Lochaber, Antigonish County, N.S.

Thirty-six do do do Escasoni, C.B.

Eighty do do do George River, Bras d'Or, C.B.

Forty-five do do do Lévis, Que.

One hundred and twenty-five fossil plants from the Devonian rocks at various localities in Nova Scotia.

A. P. Low:—

Fifty-four specimens of fossils from the Cambro-Silurian or Silurian rocks of limestone rapid on the Fawn branch of the Severn River.

A. C. Lawson:—

Black variety of the Wood chuck (*Arctomys empetre*) and five fresh water shells (three *Unio luteolus* and two *Anodonta Footiana*) from Rainy Lake.

H. M. Ami:—

About one thousand specimens of fossils from the Cambro-Silurian and Silurian rocks at various localities in the Provinces of Quebec and Ontario.

Seventy-two specimens of fossils from the Post-Pliocene nodules of Green's Creek, near Ottawa, Ont.

L. W. Bailey :—

About six hundred specimens of fossils, chiefly of Silurian age, from different localities in the Provinces of Quebec and New Brunswick or from the adjacent parts of Maine.

W. McInnes :—

Ninety specimens of fossils from the Silurian and Devonian rocks of New Brunswick.

R. Chalmers :—

Fifty specimens of fossils from the Upper Devonian rocks of Scaumenac Bay, Que.

Four arrow heads, a number of quartz chipped flakes and an ancient iron axe head, all from the Tabucintac River, N.B.

Walrus bones from Miscou Island, N.B.

The additions to this branch of the Museum, by presentation and purchase, are as follows :—

By Presentation :—

The Department of Marine :—Specimens of the following species of mammals, birds, &c., all collected by Mr. F. F. Payne, in 1886, at Cape Prince of Wales, Hudson's Strait :—

Two Artic Foxes (*Vulpes lagopus*) in summer fur. Three Hudson's Bay Lemmings (*Myodes torquatus*) two in summer and one in winter fur, and one Polar Hare (*Lepus glacialis*) in winter fur.

One Stone Chat (*Saxicola œnanthe*) the first known to have been taken in Canada; one Shore Lake (*Eremophila alpestris*); one Water Thrush (*Siurus naevius*); one Lapland Longspur (*Plectrophanes Lapponicus*); one Raven (*Corvus corax*); one immature Gyr Falcon (*Falco sacer*) in very dark plumage; one Rough legged Buzzard (*Archibuteo lagopus*); two Rock Ptarmigans (*Lagopus rupestris*) one in full summer the other in winter plumage; one Ring-necked Plover (*Ægialitis semipalmatus*); pair of Red Phalaropes (*Phalaropus fulicarius*); one Purple Sandpiper (*Tringa maritima*); one White-rumped Sandpiper (*Tringa Bonaparti*); male Brant Goose (*Bernicla brenta*); one Hutchins' Goose (*Bernicla Hutchinsii*); two Long-tailed Ducks (*Harelda glacialis*), one male in summer plumage and one female; one Harlequin duck (*Histrionicus torquatus*) adult male; one Herring Gull (*Larus argentatus*); one common Tern (*Sterna hirundo*); one Great Northern Diver or Loon (*Colymbus torquatus*); one male red throated Diver (*Colymbus septentrionalis*); three Black Guillemots (*Uria grylle*) one an adult male in summer plumage and two in winter plumage; and one Little Auk (*Mergulus alle*). Four eggs of the Shore Lark, twenty-two of the Water Thrush, twenty-four of the Snow Bunting (*Plectrophanes nivalis*), eight of the Ring Necked Plover, four of the King Eider (*Somateria spectabilis*), five of the Herring Gull, one of the Common Tern, two of the Red Throated Diver, and seven of the Black Guillemot.

One rather large variety of the Speckled or Brook Trout (*Salvelinus fontinalis*).

Department of Fisheries :—

One Black Porpoise (*Phocœna communis*) and one Hooded Seal (*Cystophœra cristata*) both stuffed.

Smithsonian Institution, Washington :—

Specimens of the following shells, viz: Five *Strombus gigas*, one *Tridacna gigas*, two *Mopalia Wossnessenskyi*, two *Pteroceras bryoniæ*, one *Triton triton*'s, one *Fusus proboscoidiferus*, one *Cassis cornutum*, one *Spondylus sp.*, one *Tridacna elongata* and six *Capsa desolata*.

Dr. R. Bell, Ottawa.

Black variety of the American Hare (*Lepus Americanus*) from the Hudson Bay district.

Dr. Percy M. Mathews, York Factory, Hudson's Bay :—

One Weasel or Ermine (*Putorius ermineus*) in winter fur, and one young Musk Rat (*Fiber zibethicus*) both from Fort Severn, Hudson's Bay. One Belted Kingfisher (*Ceryle Alcyon*) from Fort Severn; one Golden-winged Woodpecker (*Colaptes auratus*) and one Goshawk (*Astur palumbarius*) from York Factory; three goslings of the Canada Goose (*Bernicla Canadensis*) and one Lesser Scaup Duck (*Fulix affinis*) from Fort Severn; one Long-Tailed Duck (*Harelda glacialis*) in spring and one in autumn plumage, and one King Eider (*Somateria spectabilis*) all from York Factory; two Surf Scoters (*Oedemia perspicillata*) from Fort Severn; and one Black Guillemot (*Uria grylle*) from York Factory. These, though presented in 1885, were not received until 1886.

Arthur Laperrière, Temiscamange :—

Fine specimen of the Ringed Seal (*Phoca (Pusa) foetida*) from Cape Digges, Hudson's Bay.

W. Skinner, Toronto :—

Specimen of the Harbour Seal (*Phoca vitulina*) from Nachvak, Northern Labrador, and siphuncle of a species of *Orthoceras*, from Fort Churchill, Hudson's Bay.

Sir William Dawson :—

Twenty-eight species of marine shells and seven of echinodermata from the Gulf of St. Lawrence.

Montague Chamberlain St. John, N.B. :—

One Merganser (*Mergus merganser*), pair of Long-tailed Ducks (*Harelda glacialis*), one Kumlien's Gull (*Larus Kumlieni*), one Great Black Backed Gull (*Larus marinus*), two Gulls, immature, one young Cormorant (*Graculus carbo*?), two young Loons (*Colymbus torquatus*) and two young Red Necked Grebes (*Podiceps Holbolli*).

James Deans, Victoria, B.C. :—

Three fine specimens of a *Trigonia* (probably *T. intermedia*, Fahrenkohl), one of *Thracia semiplanata*, one of *Unio Hubbardi*, a cast of an *Inoceramus*, one *Stephanoceras cepoides*, a fossil fruit (*Dioonites Columbianus*), two pieces of fossil wood and three concretions, all from the Middle Cretaceous rocks of the Queen Charlotte Islands.

Walter R. Billings, Ottawa :—

Two specimens (each the types) of *Archæocrinus desideratus* and *Euspirocrinus obconicus*, from the Trenton Limestone of Ottawa city.

Andrew B. Hender-on, Ottawa :—

Skull of Black Bear (*Ursus Americanus*) and do of Beaver (*Castor fiber*) from the Sturgeon River.

W. G. Allan, Marlbank, Ontario :—

Stone implement of Indian manufacture.

W. Moore, Bowesville, Ont. :—

Stone gouge from the Black Rapids on the Rideau River.

Rev. W. A. Burman, Griswold, Manitoba :—

Skin of Striped Gopher (*Spermophilus tridecemlineatus*) and skin of Ermine (*Putorius ermineus*), also two roots of "Cree Turnip" (*Psoralea esculenta*) as prepared for food by the Indians. All from Manitoba.

F. R. Latchford, Ottawa :—

Six fresh water bivalve shells, (viz., four *Unio nasutus* from Toronto Bay, and two *Unio borealis* from the Ottawa River).

James Fletcher, Ottawa :—

One Jumping Mouse (*Zapus Hudsonicus*), two Field Mice (*Arvicola*), one Striped Gopher (*Spermophilus tridecemlineatus*) and a snake, all from Regina.

P. B. Winning, Plantagenet, Ont. :—

Specimens of characteristic fossils of the Trenton Limestone of that locality.

[PART III]

T. A. Burrows, Winnipeg :—

Fine specimen of the left valve of *Inoceramus problematicus*, from the Cretaceous Rocks of Vermilion River, Riding Mountain, Manitoba.

H. K. Jordan, Newport, Monmouthshire :—

Specimen of *Buccinofusus Bernicensis*, a rare deepsea shell from the Dogger Bank, coast of Northumberland, and ten species of British Chitonidæ.

Lyndwode Pereira, Ottawa :—

Stone Maul from the Qu'Appelle District.

R. L. Johnston, Banff, N. W. T. :—

Rocky Mountain Rat (*Neotoma cinerea*).

W. Craig, Russell, Ont. :—

Adult male Porcupine (*Erethizon dorsatus*) from the Township of Russell.

Samuel Edey, Aylmer, Que. :—

Short Eared or Marsh Owl (*Asio brachyotus*) from Aylmer, P.Q.

J. G. Vincent, Osnaburgh House *via* Wabigoon, C. P. R. :—

Two fossil shells from the Albany River.

T. Probert, New Edinburgh, near Ottawa :—

Female Marsh Harrier (*Circus cyaneus*, var. *Hudsonicus*).

By Purchase :—

Skin, &c., (since mounted) of Northern Fur Seal (*Callorhinus ursinus*) from the west coast of Vancouver Island, and skeleton of another specimen of the same, which latter has been cleaned and mounted by Mons. Jules F. D. Bailly.

One Blue Jay (*Cyanurus cristatus*), one Barred Owl (*Syrnium nebulosum*), one Acadian Owl (*Nyctale Acadica*), and a pair of Snowy Owls (*Nyctea Scandiaca*), all from the neighborhood of Ottawa City.

One Kildeer Plover (*Ægialitis vociferus*), and a young Eared Grebe (*Podiceps auritus*), both from the vicinity of Toronto.

Two Cretaceous fossils, viz., one *Placenticerus placenta*, var. *intercalaris* and an unusually large and perfect specimen of *Cyprina ovata*, var. *alta*, from the Bow River.

Some large and interesting exotic shells have also been acquired by exchange with Prof. H. A. Ward, of Rochester, N. Y.

BOTANY.

Prof. John Macoun was occupied during the early part of the past year in completing the third part of his catalogue of Canadian plants and in preparing a collection of Canadian plants for display in connection with the Colonial and Indian Exhibition. Prof. Macoun left on the 8th of April for England, returning to Ottawa at the close of his duties in connection with the exhibition on the 29th of November.

The third part of the Catalogue of Canadian Plants above referred to, including a complete index to the first three parts, is a pamphlet of 228 pages. The three parts now published are arranged to bind together as a volume which incloses in all 623 pages and embraces all the known dicotyledonous plants of the Dominion, with the geographical range and synonymy of each constituting a *flora* of the Dominion, though without descriptions of species. The volume represents 101 orders, 584 genera and 2,207 species, exclusive of varieties. In consequence of Prof. Macoun's absence much of the work connected with the preparation of the index to the first volume had to be attended to by Mr. J. M. Macoun, while Mr. James Fletcher, of the Parliamentary Library, devoted a large amount of time and attention to the critical revision of the proof sheets during the printing of the work in Prof. Macoun's absence.

The only important collection made during the past year is one by Mr. J. M. Macoun while acting as assistant to Mr. A. P. Low, in the country between Lake Winnipeg and Hudson Bay.

While in England in connection with the Colonial and Indian Exhibition, Prof. Macoun devoted himself to giving information in regard to the collections of woods and natural products shown there, in which much interest was manifested, both from a strictly scientific point of view and in their commercial bearings. Relations were also established with various institutions which will prove of advantage in connection with the prosecution of the botanical work.

In addition to the work above mentioned as having been performed by Mr. J. M. Macoun, while acting as assistant to Prof. Macoun, he has mounted for the Herbarium during the past year sheets of specimens of Canadian, United States and European plants.

These have been sent to various institutions and individuals by way of exchange or in consideration of assistance rendered in the prosecution of the work.

CHEMISTRY AND MINERALOGY.

Mr. G. C. Hoffmann furnishes the subjoined summary of work carried out by him, or under his direction, in the laboratory of the survey, with a list of donations to the mineralogical section of the Museum. In addition to the work mentioned in Mr. Hoffmann's report, he has devoted a portion of his time to superintending the arrangement of the specimens in the Museum and in determining and naming them.

In accordance with the practice of preceding years, the work carried out in the chemical laboratory during the past year, may, on the whole, be said to have been of a purely practical character; the time having been almost entirely occupied in the examination and analysis of such minerals, etc., as were considered likely to prove of commercial importance. The work embraced:—

I—Analyses of numerous iron ores.

II—Analyses of copper and manganese ores.

III—Analyses of platinum ore.

IV—Analyses of several mineral waters.

V—Gold and silver assays—The number of which far exceeded that of any preceding year.

VI—Miscellaneous examinations—under which heading are included cement-stones, marls, saline deposits, etc., etc.

There has been a very marked increase in the number of mineral specimens received for examination; these amounted to five hundred and forty-six, as compared with three hundred and thirty-nine for last year. By far the greater number of these were brought by visitors and the results of the examination together with information in regard to their economic value were in most instances communicated in the course of a personal interview. The number of letters written amounted to one hundred and fifty-one, the majority of which constituted reports embodying the results of the examination, analysis or assay of mineral specimens—chiefly those received from distant parts.

Mr. F. D. Adams, assistant chemist, was engaged in laboratory work up to the close of the first week in April, when he left for England on matters connected with the Colonial and Indian Exhibition. Mr. E. B. Kenrick, who has been acting as junior assistant chemist, merits commendation for the diligence with which he has applied himself to the work entrusted to him.

In the mineralogical section of the Museum many of the old exhibits have been replaced by better specimens, and one hundred and fifty-one new ones added, including the following presentations:—

Allan, W. A., Ottawa:—

Four specimens of muscovite, from the Villeneuve mica mine, Villeneuve, Ottawa county, Que.

Elwyn, T., Victoria, British Columbia:—

Platinum ore, from Granite Creek, Similkameen River, B.C.

Ells, R. W., of the Geological and Natural History Survey, Ottawa:—

Steatite, from Gouverneur, Lawrence county, N.Y.

- Asbestos, from Maryland, U.S.A.
 Asbestos, from Italy.
 Asbestos yarn and sheeting, manufactured from the asbestos of Thetford, Mégantic county, Que.
- Fletcher, James, Ottawa:—
 Chabazite, from the Bay of Fundy, N. S.
 Concretionary nodule, from Green's Creek, Gloucester, Carleton county, Ont.
- Harrington, Dr. B. J., Montreal:—
 Sodalite, from Mount Royal, Montreal, Que.
 Huronite, from between Loch Alch and Missinabi stations, C.P.R.
- Hill, Albert J., C.E., New Westminster, British Columbia:—
 Molybdenite, from Lillooet River, vicinity of New Westminster, B.C.
- Keefer, T. A., Port Arthur, Ontario:—
 Five specimens of argentite and one specimen of argentite associated with native silver, from the Porcupine mine, district of Thunder Bay, Ont.
- Kirkland, ——— Port Arthur, Ontario:—
 Two specimens of native silver from the Beaver mine, district of Thunder Bay, Ont.
- Leach, J. A., Ottawa:—
 Specular iron, from Shefford, Shefford county, Que.
- Moberly, H. J., Fort Vermilion, N.-W.T.:—
 Four specimens of gypsum, from Peace Point, Peace River, N.-W.T.
- Onésime, Frère, Professeur d'histoire naturelle, Pensionnat des Frères des Ecoles Chrétiennes, Lyon (Rhône), France:—
 Arseniosiderite, from a manganese bed at Romanèche, Department of Saône-et-Loire, France. A rare mineral found only at this locality and then but at rare intervals.
 Walchowite, from between Thonon and the Chateau des Allinges, Haute Savoie, France.
 Amianthus (fibrous hornblende), from the Piedmontese Alps, Italy.
 Talc, from the quarry of Braly near Pignerol, Piedmont, Italy.
 Vaugnerite, from Vaugnerais near Lyon, France.
 The foregoing are all handsome specimens.
- Powell, E. Grant, Ottawa:—
 An association of quartz, mica, and apatite, from the township of Miller, Frontenac county, Ont.
 Specimens of mica, with inclusions, from the same locality.
- Reed, Dr. James, Reed-dale, Mégantic County, Que.:—
 Specimens of chromite from the townships of Thetford, Coleraine, and Leeds, Mégantic county, Que.
- Rehm, Gustav Von, Ottawa:—
 Specimen of muscovite, with inclusions of garnet from the Villeneuve mica mine, Villeneuve, Ottawa county, Que.
- Rhodes, Curry & Co., Amherst, N.S.:—
 A specimen of red sandstone (cube, dressed) from Amherst, N.S.
- Russell, M. L., Renfrew, Ont.:—
 Pyrrhotite, from the vicinity of Sudbury, McKin, District of Nipissing, Ont.
- Shirley, L. H., C.E., Buckingham, Ottawa County, Que.:—
 A crystal of black tourmaline, from Wakefield, Ottawa county, Que.; and the following from the Villeneuve mica mine, Villeneuve, Ottawa county, Que.:—Five specimens of microcline.
 Specimens of quartz.
 An Association of quartz, muscovite, albite and garnet.
 Specimens of albite.
 A large fragment of albite (in association with some muscovite, a little quartz and garnet) penetrated by crystals of black tourmaline. This is a very handsome specimen.

Torrance, J. F., Montreal :—

Infusorial earth, from Folly Lake, Colchester county, N.S.

Treen & Fish, Newcastle, N.B.

A specimen of grey sandstone (cube, dressed) from the vicinity of Newcastle, Northumberland county, N. B.

Welden, F. C., Grenville, Que. :—

A specimen of disseminated graphite, from Grenville, Argenteuil county, Que.

Wylie, W. H., Carleton Place, Ont. :—

Two specimens of barite, from Pakenham, Ont.

Young, James :—

A specimen of dolomite (cube, dressed) from the Narrows of Lake Manitoba.

Mr. C. W. Willimott was actively engaged, up to the time of his departure for England at the close of March, in receiving, cataloguing and packing the mineral collection for the Colonial and Indian Exhibition.

The greater part of Mr. R. L. Broadbent's time has been devoted to the permanent labelling of the mineral collection, re-adjusting of some of the cases, and work of a like nature. He has made up and catalogued six mineral collections, comprising 340 specimens, for distribution. He also rendered some assistance to Mr. Willimott, and after the latter's departure attended to matters connected with the shipment of such goods as arrived too late for forwarding with the first consignments.

MAPS.

The greater part of the time of Mr. S. Barlow, chief draftsman, has been devoted, as usual, to the general superintendence of the mapping work, and in discussing the material for the selection of fixed points in the various sheets in progress.

Mr. Barlow furnishes the following memoranda of maps completed or in course of completion :—

British Columbia.—A map of the western part of Vancouver Island and adjacent coast on a scale of eight miles to an inch, which is intended to illustrate a forthcoming report on the geology, is now nearly ready for the engraver. Mr. Bowman's revised map of the southern interior of the same province is in the draftsman's hands and will probably be finished this winter. The map of the Cariboo mining district is also in course of compilation and will be pushed through as rapidly as possible.

British Columbia and North-West Territory.—Dr. Dawson's map of a portion of the Rocky Mountains, mentioned in the last summary report, has been completed and published as a reconnaissance map, including all available information up to date.

North-West Territory.—A map of the Cascade coal basin, on a scale of $1\frac{1}{2}$ inch to a mile, in the Rocky Mountains, has been drawn and photo-lithographed and is published in Dr. Dawson's report. Mr. McConnell's map of the Cypress Hills and Wood Mountain has been engraved and published. Mr. J. B. Tyrrell's map comprising the third sheet on a uniform scale of 8 miles to an inch and including the country between the upper parts of the Bow and North Saskatchewan Rivers, will, it is hoped, be completed for publication in a few months.

Manitoba and Western Ontario.—Mr. Lawson's map of the Lake of the Woods and its vicinity is in the hands of the engraver and will very shortly be published, various unforeseen difficulties in connection with the topography of this map have unavoidably delayed its publication. Work to the south and south-east of the above sheet also carried out by Mr. Lawson, is in the draftsman's hands, but will not be completed for publication before the work of another season in the field is available.

Ontario.—Mr. E. D. Ingall has in course of completion a contoured map of Silver Mountain and vicinity, Thunder Bay district. This covers an area of about forty square miles and will be published in a few months.

Mr. Cochrane has continued the work of last season in sheet No. 115, referred to as in course of revision in the last summary report. During the past season he was occupied from June 28th to October 24th in examining and correcting 900 square miles of the area embraced, leaving about 300 square miles to be revised before the completion of the sheet. In the course of this work various measurements were made where found necessary. The progress of the mapping work by Mr. Coste and assistant is referred to elsewhere. Copies of 57 township plans in Ontario have been procured and about 750 miles of railway lines, on a large scale, have been copied, for the purpose of checking and correcting the township surveys.

Quebec.—The map of Lake Mistassini has been published in Mr. Low's report. In the course of Mr. Ellis' examination of a part of the Eastern Townships a number of road surveys have been made and are being added to the engraved map. It has been found impossible, owing to the press of work in the office, to add much to the map of Ottawa and Pontiac counties during the past year.

New Brunswick.—One sheet (plan 2 S.W.) has been published.

Nova Scotia.—One sheet (plan 4 N.W.) has been published.

The work in progress in Nova Scotia and New Brunswick, with surveys carried out in the region between Hudson Bay and Lake Winnipeg, is fully noticed in connection with the field work of the various parties.

LIBRARY.

The Librarian, Dr. Thorburn, reports that during the year 1886, from January 1st to December 31st, 8,185 copies of the Geological and Natural History Survey publications were distributed; of these 6,924 were distributed in Canada; the remainder 1,261 were sent as exchanges to scientific and literary institutions and individuals in America, Europe, India, Japan and Australia, etc.

Seven hundred and twelve publications, including books, transactions, memoirs, periodicals, pamphlets and maps were received as exchanges. There were added to the Library during the year, by purchase, 101 volumes, besides 43 scientific magazines and periodicals on geological, mineralogical and natural history subjects which were subscribed for.

During the year 189 volumes were bound. There are now in the Library about 6,500 volumes. The number of letters received was 1,060, the number sent out 898.

During the past year a card catalogue has been completed, and is now in use. It will be found to be of great practical value, and will materially assist the members of the Geological Survey staff in finding, more readily than formerly, what books there are in the Library which treat of any subject on which information is wanted.

VISITORS.

The number of visitors to the Museum during the year ended 31st December, 1886, was 14,465, an increase, as compared with the previous year, of 1,022.

STAFF, APPROPRIATION, EXPENDITURE AND CORRESPONDENCE.

The strength of the staff at present employed is 50, viz., professional, 34, ordinary, 16.

During the year the following promotions were made in the permanent staff:

Messrs. L. M. Lambe, and A. P. Low from third class to second class clerks.

The amount available for the fiscal year ended 30th June was:—

Civil list salaries, appropriation.....	\$ 36,200 00
General purposes do	78,53 01
Total.....	<u>\$115,053 01</u>

The expenditure may be summarized under the divisions named as follows:—

Pay list salaries.....	\$ 35,936 03
Wages, temporary employees	19,142 60
Exploration and survey	36,895 44
Printing and lithography	15,383 45
Purchase specimens.....	1,722 05
Purchase books and instruments	3,334 16
Laboratory apparatus and chemicals.	329 14
Stationery.....	591 89
Incidental and other expenses.....	3,828 02

\$116,662 83

Less paid in 1885..... 11,006 59

\$105,656 24

Advances to field explorers and others on account
1886-87 8 837 48

Unexpended balance civil list appropriation..... 263 97

Unexpended balance contingency appropriation..... 295 32

\$115,053 01

The correspondence of the branch shows a total of 10,673 letters sent, and 8,420 received.

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

ALFRED R. C. SELWYN,
Director.

PART IV.

NORTH-WEST TERRITORIES.

REPORT CONCERNING THE ADMINISTRATION OF THE NORTH-WEST TERRITORIES FOR THE YEAR 1886.

GOVERNMENT HOUSE,
REGINA, 3rd January, 1887.

To the Honorable
The Minister of the Interior,
Ottawa.

SIR,—I have the honor to submit the following report concerning the administration of the North-West Territories for the year 1886.

SESSION OF COUNCIL.

The Council of the North-West Territories opened on the 13th October and closed the 19th November.

The members composing it were:—

Lieut.-Col. Hugh Richardson, *ex-officio*.
Lieut.-Col. James F. McLeod, C.M.G., *ex-officio*.
Charles B. Rouleau, *ex-officio*.
Paschal Breland, nominated.
Lieut.-Col. A. G. Irvine, nominated.
Hayter Reed, nominated.

Elected Members.

James H. Ross, for electoral district of	Moose Jaw.
John G. Turriff	do Moose Mountain.
Spencer A. Bedford	do Moosomin.
William D. Perley	do Qu'Appelle.
Dr. Herbert C. Wilson	do Edmonton.
Viscount Boyle	do McLeod.
Charles Marshallsay	do Broadview.
Samuel Cunningham	do St. Albert.
Owen E. Hughes	do Lorne.
John Secord	do Regina.
David F. Jelly	do do
John B. Lauder	do Calgary,
Hugh S. Cayley	do do
Robert Cawford, 2nd member for	Qu'Appelle.

Legislation.

The following ordinances were passed at the above Session of Council, namely:—

No. 1. An Ordinance respecting Municipal matters in the Town of Calgary.

No. 2. An Ordinance respecting the Administration of Civil Justice.

No. 3. An Ordinance respecting the incorporation of Joint Stock Companies by Letters Patent.

No. 4. An Ordinance respecting Juries.

No. 5. An Ordinance respecting the holding of lands in trust for Religious Societies and Congregations.

No. 6. An Ordinance to facilitate the conveyance of Real Estate by married women.

No. 7. An Ordinance to amend the Municipal Ordinance of 1885.

No. 8. An Ordinance to incorporate Agricultural Societies in the North-West Territories.

No. 9. An Ordinance to incorporate companies for the establishment of Cemeteries.

No. 10. An Ordinance to amend the School Ordinance of 1885.

No. 11. An Ordinance respecting Fire Districts.

No. 12. An Ordinance to amend Ordinance No. 21 of 1884, respecting the licensing of Billiard and other Tables, and for the prevention of Gambling.

No. 13. An Ordinance to amend No. 21 of 1885, respecting prairie Fires.

No. 14. An Ordinance to amend Ordinance No. 12 of 1885, intituled: "An Ordinance respecting Poisons."

No. 15. An Ordinance to further amend Ordinance No. 8 of 1883, intituled: "An Ordinance for the protection of Game."

No. 16. An Ordinance to amend Ordinance No. 13 of 1881, intituled: "An Ordinance respecting Bulls."

No. 17. An Ordinance to further amend Ordinance No. 29 of 1884, intituled: "An Ordinance to amend and consolidate as amended, the several Ordinances respecting Fences."

No. 18. An Ordinance to repeal Ordinance No. 20 of 1885, and to amend Ordinance No. 1 of 1884, intituled: "An Ordinance respecting the herding of Animals."

No. 19. An Ordinance to incorporate a General Hospital at Regina.

No. 20. An Ordinance to legalize certain By-laws of the Corporation of the Municipality of South Qu'Appelle and the Debentures issued thereunder.

No. 21. An Ordinance to legalize a certain By-law of the Municipal Council of the Town of Regina.

Judicial.

The most important of the Ordinances passed by the Council at its last session is the one relating to the administration of Civil Justice. Its provisions, in the main, are based upon the English Judicature Act, with some of the modifications introduced in Nova Scotia and Ontario, which appeared to suit the requirements of the Territories.

This Ordinance, in thus assimilating the Administration of Civil Justice in the Territories to that which obtains in the Provinces, will, undoubtedly, prove highly beneficial.

It will come into force by Proclamation of His Excellency the Governor General, together with the Act of the Parliament of Canada constituting the Supreme Court of the North-West Territories.

SCHOOLS.

The School Ordinance passed at the Session of the North-West Council held in December, 1885, came practically into operation on the 1st of April last.

It has met with general approval throughout the Territories, and with the few amendments (principally in details) passed at last Session of Council, it is now a good workable Ordinance. The Board of Education is now fully organized and has passed regulations for the general conduct of schools which appear to meet the requirements of trustees, teachers and pupils.

During the year a large number of new districts have been erected, and we have now seventy-seven Protestant and sixteen Roman Catholic districts established in the Territories; in all ninety-three schools, against fifty-nine at same date last year—an increase of thirty-four.

Of this total number we had sixty-four Protestant schools in operation during the summer term (*i. e.* from 1st April to 31st October last) with an attendance of 2,041 pupils, and twelve Catholic schools with 512 pupils.

From returns received it appears that out of the 2,553 pupils who attended during the term mentioned, 669 attended 100 days or more.

For the present term (*i. e.* from 1st November last to 31st March, 1887,) there are fifty-one schools in operation, with about 2,150 pupils per registers.

Eight petitions for new districts are now pending. When these are established and added to the other newly erected districts, now preparing for work, I look for at least 100 schools to open on 1st April for the summer term, with from 3,300 to 3,500 pupils.

The Board of Education has established a system of examinations for teachers' certificates. The first examination will be held on 11th January next.

Already forty-seven teachers have signified their intention of presenting themselves for examination, two for first-class certificates, nine for second-class, and thirty-six for third-class.

The present constitution of the Board of Education is as follows:—

Chairman: The Lieutenant Governor.

Protestant Section: John Secord and Charles Marshallsay.

Roman Catholic Section: C. B. Rouleau, S. M. and A. E. Forget.

The following is a list of the officials connected with the Board:—

Secretary: James Brown.

Board of Examiners.

Protestant Member: Rev. Dan. Lewis.

Roman Catholic Member: Rev. J. Hugonard.

School Inspectors.

Protestant: Thos. Grover, Regina; John Hewgill, Moosomin; Rev. John McLean, B. A., McLeod; Rev. A. B. Baird, B D, Edmonton; Rev. Canon Flett, B.D., Prince Albert; P. G. Laurie, Battleford.

Roman Catholic: M. M. Seymour, M.D., Fort Qu'Appelle; J. W. Costello, Calgary; Rev. A. André, Prince Albert; E. M. Richard, Battleford.

For further particulars regarding the state of education in the Territories, I beg leave to refer you to the Report of the Board of Education, copy of which I append hereto.

APPOINTMENTS.

The following is a list of Territorial appointments made during the year 1886:—

Justices of the Peace.

Hubert Blake.	Wapella,	Assiniboia.
Henry Oscar Partridge.....	Sintaluta	do
Hilton Keith.....	Touchwood Hills	do
John Hewgill.....	Moosomin	do
Richard Blythe.....	Wapella	do
Farquhar Beaton.....	do	do
Francis Cosgrave.....	Whitewood	do
George F. Dunn.....	Moosomin	do
Thomas Peden.....	Shellmouth P.O., Manitoba.	
Jean Edward Flaherty.....	Gleichen, Alberta.	
William H. Minninnick.....	Kinbrae, .	Assiniboia.
Joshua Milligan.....	Touchwood Hills	do
Louis Marion.....	Duck Lake, Saskatchewan.	
William Craig.....	Prince Albert	do
Eric Knight.....	Regina, Assiniboia.	
Joseph H. Millward.....	Calgary, Alberta.	
John D. Moodie.....	Insp. N.-W. Mounted Police.	
William Nolan Costello.....	Calgary, Alberta.	
Hartley Gisborne.....	Battleford, Saskatchewan.	
Bernard Brewster.....	Prince Albert	do
William Denny Antrobus.....	Supt. N.-W. Mounted Police.	
Andrew R. Dixon.....	Balgonie, Assiniboia.	

William Carnegie de Balinhard.....	Calgary, Alberta.
George Duck.....	Prince Albert, Saskatchewan.
Major James Frederick Wilson.....	Moose Jaw, Assiniboia.
George A. Stewart.....	Banff, Alberta.
Jacob W. Smith.....	Regina, Assiniboia.
Francis Norman.....	Insp. N.-W. Mounted Police.
Seymour Noel de Puisage Green.....	Moose Jaw, Assiniboia.
Reverend Shafto Agassiz.....	Fort Pelly do
James Grier.....	Fort McLeod, Alberta.
William Francis Johnson.....	Katopwe, Assiniboia.
Alexander G. Thorburn.....	Broadview do
Alexander Stewart.....	Castle Avery, Manitoba.
Charles Robertson.....	Kinistino, Saskatchewan.
Henry D. Likely.....	Insp. N.-W. Mounted Police.
Andrew Spence.....	Red Deer Hill, Saskatchewan.
Alexander Stansfield.....	do do
Captain James Howie.....	Prince Albert do
George Sutherland.....	Sturgeon River, Alberta.
John F. Betts.....	Prince Albert, Saskatchewan.
George C. King.....	Calgary, Alberta.
Thomas Anderson.....	Dunvegan do
Charles Nolin.....	Batoche, Saskatchewan.
George J. Fisher.....	do do
Robert Wishart.....	Touchwood Hills, Assiniboia.
William E. Jones.....	do do
Alexander Cameron.....	Sturgeon River, Alberta.
James Thomson.....	Calgary do
Thomas Copland.....	Saskatoon, Saskatchewan.
Isaac Jones.....	Pheasant Forks, Assiniboia.

Notaries Public.

George Frederick Hinck.....	New Alsace, Assiniboia.
Levi Thomson.....	Wolf Creek do
Charles P. Conybeare.....	Lethbridge, Alberta.
William Johnson.....	Moosomin, Assiniboia.
Joshua Milligan.....	Quill Plain do
Thomas Brown Lafferty.....	Calgary, Alberta.
Robert Dundas Strong.....	Qu'Appelle Station, Assiniboia.
John Pascoe J. Jephson.....	Calgary, Alberta.
Thomas Ede.....	do do
Peter McCarthy.....	do do
Charles H. Connon.....	Regina, Assiniboia.

Coroners.

William Leckie Bain, M.D.....	Wolseley, Assiniboia.
Andrew Henderson, M.D.....	Calgary, Alberta.
Andrew E. Porter, M.D.....	Prince Albert, Saskatchewan.
Hilton Keith.....	Touchwood Hills, Assiniboia.
Laurence John Munro, M.D.....	Edmonton, Alberta.
John Hutchison, M.D.....	Grenfell, Assiniboia.
Duncan J. Campbell.....	McLeod, Alberta.

Commissioners for taking affidavits outside the North-West Territories.

James Burridge.....	Winnipeg, Manitoba.
Duncan L. McDougall.....	Montreal, Quebec.
William Prescott Sharp.....	do do

Issuers of Marriage Licenses.

Alfred F. Grady.....	McLeod, Alberta.
Arthur Goldsmid.....	Wolverine, Assinibolia.
Joseph Clementson.....	Broadview do
William Syme Redpath.....	Qu'Appelle Station, Assinibolia.
Herbert Hill.....	Sumner, Assinibolia.
Henry Ellis Skinner.....	Katepwe do
William H. Minhinnick.....	Kinbrae do
John Gilbert Gordon	Moose Jaw do
Robert L. Alexander.....	do do
William Andrew Smith.....	Workman do
Reverend Shafto Agassiz.....	Fort Pelly do
William Francis Johnston.....	Katepwe do
John Henry Charles Willoughby...	Saskatoon, Saskatchewan.
Charles F. P. Conybeare.....	Lethbridge, Alberta.
Christian Troyer.....	Alameda, Assinibolia.
William Dixon.....	Maple Creek do

Fire Guardians.

(Under Ordinance No. 21 of 1885.)

John Henry Hawks.....	Regina, Assinibolia.
John McNaughton	do do
Thomas Fleming.....	do do
James Duncan.....	do do
John Herron	Pincher Creek, Alberta.
Charles Kettles.....	do do
W. Bell.....	Walrond Ranch do
William Cochrane.....	Cochrane Ranch do
F. C. Inderwick.....	North Fork do
F. W. Godsall	South Fork do
John Duthie.....	Pincher Creek do
George Chaffee.....	Prince Albert, Saskatchewan.
Louis Marion.....	Duck Lake do
G. W. Wood.....	Maple Creek, Assinibolia.
J. J. English	do do
Richard J. Pritchard	Prince Albert, Saskatchewan.
Andrew N. Patterson.....	Carlton do
George Tait	Puckahn do
Robert Adams.....	Kirkpatrick do
Jean Caron.....	Batoche do
Alexander McKay.....	St. Andrews do
James Fergus.....	Yorkton, Assinibolia.
James Campbell.....	Kinbrae do
John A. Snell.....	Yorkton do
James McCaughy.....	Alameda do
John Sample	Kenlis do
Charles Downing.....	do do
J. A. C. Blackwood.....	do do
Joseph Gray.....	Indian Head do
Justus Beech.	do do
C. F. Brown.....	do do
Thomas Donelly	do do
W. A. B. Fishleigh.....	do do
A. S. McLennan	Katepwe do
John Crawford.....	Indian Head do
G. C. Battiscombe.....	do do

J. C. Valteau	Indian Head, Assiniboia.
John Sheppard.....	do do
Alexander McAllum.....	do do
Angus McKay.....	do do
W. H. Stephens.....	do do
James Moxon.....	do do
Robert Railton.....	Carson do
Alexander Debenham.....	do do
Dennis Quigley.....	do do
Thomas Davis.....	do do
Thomas Banks.....	do do
Arthur T. Cadwallader.....	Kinistino, Saskatchewan.
James Tenant	do do
Thomas Sanderson	do do

Game Guardians.

Charles L. Gouin.....	Calgary, Alberta.
James Nixon	Kinbrae, Assiniboia.
Joseph Hanafin	Prince Albert, Saskatchewan.
George Tait.....	Puckahn, Saskatchewan.
Alexander Stansfield	Red Deer Hill, Saskatchewan.
Alexander McBeath	Prince Albert do
Thomas Sanderson	Kinistino do
Arthur T. Cadwallader	do do
James Tenant	do do
Edward Salisbury	Crescent Lake, Assiniboia.

Advocates.

(Enrolled pursuant to Ordinance No. 10 of 1885.)

David Lynch Scott, Q.C.....	Regina, Assiniboia.
Nicholas Flood Davin.....	do do
William Cayley Hamilton.....	do do
Thomas Cooke Johnstone.....	do do
Amédée E. Forget.....	do do
John Secord	do do
William Prescott Sharp.....	do do
Frederick Fraser Forbes	do do
James Henry Benson	do do
William Grayson	Moose Jaw do
Thomas Cristopher Down.....	Broadview do
Robert B. Gordon	Regina do
James A. Loughheed.....	Calgary, Alberta.
John C. F. Bown.....	do do
George A. Watson	Edmonton do
John R. Costigan.	Calgary do
William Johnson.....	Moosomin, Assiniboia.
Herbert N. Morphy.....	Fort Qu'Appelle, Assiniboia.
James P. Mitchell.....	Medicine Hat do
Ralph A. Stevenson.....	Moosomin do
John Gilbert Gordon.....	Moose Jaw do
Colin Nicol Campbell.....	Calgary, Alberta.
Eudo Saunders.....	Regina, Assiniboia.
Fitzgerald Cochrane.....	Calgary, Alberta.
Herman Joseph Eberts	Indian Head, Assiniboia.

Arthur Lewis Sifton.....	Prince Albert, Saskatchewan.
Henry W. Newlands.....	do do
William R. Gunn	do do
William V. MacIise	do do
Joseph V. Kildahl.....	Edmonton, Alberta.
Henry Bleecker.....	Calgary do
Stephen Brewster.....	Prince Albert, Saskatchewan.
William Syme Redpath.....	Qu'Appelle Station, Assiniboia.
Robert Strachan	Edmonton, Alberta.
Adélard P. Forget.....	Battleford, Saskatchewan.
Edouard Richard	do do
Charles C. McCaul	McLeod, Alberta.
Edward P. Davis.....	Calgary do
Robert Dundas Strong	Qu'Appelle Station, Assiniboia.
Hayter Reed.....	Regina do
John Pascoe J. Jephson.....	Calgary, Alberta.
Thomas Ede.....	do do
William James Scott	Battleford, Saskatchewan.
Charles Wesley Peterson.....	Calgary, Alberta.
William White.....	Moosomin, Assiniboia.
Charles H. Cannon.....	Regina do
Hugh A. J. McDougall	Fort Qu'Appelle, Assiniboia.
William Smith.....	do do
Thomas Brown Lafferty	Calgary, Alberta.

Medical Practitioners.

(Registered under Ordinance No. 11 of 1885.)

William L. Bain.....	Wolseley, Assiniboia.
Oliver C. Edwards.....	Qu'Appelle Station, Assiniboia.
Robert B. Cotton.....	Regina do
Henry Dodd.....	do do
Lawrence John Munro.....	Edmonton, Alberta.
Herbert Charles Wilson	do do
George Eliot.....	Grenfell, Assiniboia.
Henry Yarwood Baldwin.....	Assistant Surgeon, N. W.-M. Police.
John Hutchison.....	Grenfell, Assiniboia.
Henry Joseph Clark.....	Battleford, Saskatchewan.
Andrew J. Rutledge.....	Moosomin, Assiniboia.
John Alexander Duncan.....	Moose Jaw do
John H. C. Willoughby.....	Saskatoon, Saskatchewan.
Augustus Jukes.....	Surgeon, N.-W.M. Police.
William Hall.....	Fort Qu'Appelle, Assiniboia.
John C. Holme.....	Maple Creek do
James Collinge	Fort Qu'Appelle do
Maurice M. Seymour.....	do do
Hugh Urquhart Bain.....	Prince Albert, Saskatchewan.
Andrew E. Porter.....	do do
Henry A. Wright.....	Qu'Appelle Station, Assiniboia.
Herman L. McInnis.....	Edmonton, Alberta.

Medical Examiners.

(Under Ordinance No. 11 of 1885.)

Henry Dodd, M. D.	Regina, Assiniboia.
Augustus Jukes, M. D.....	do do

Printer to the Government of the North-West Territories.

Amédée Emmanuel Forget.....Regina, Assiniboia.

Sole Issuer of Billiard and other Table Licenses.

(All appointments heretofore made being cancelled.)

Robert Bell Gordon.....Regina, Assiniboia.

I append hereto a return as required by sub-section 2 of section 90 of the North-West Territories Act, 1880, of all liquor permits issued by me during the year 1886.

I have the honor to be, Sir,

Your obedient servant,

E. DEWDNEY,

Lieutenant Governor of the North-West Territories.

RETURN of Special Permissions for the importation of Intoxicating Liquors into the North-West Territories, during the Year 1886, as required by 43 Victoria, chapter 25, section 90, sub-section 2.

Permits.	Quantity of each Intoxicant in each Permit.							Total Quantities.							Remarks.	
	Whiskey.	Brandy.	Wine.	Gin.	Rum.	Alcohol.	Beer.	Porter.	Whiskey.	Brandy.	Wine.	Gin.	Rum.	Alcohol.		Beer.	Porter.
2	1								1							
43	2								43							
1,841	3								3,682							
19	3								57							
68	4								272							
31	5								155							
3	6								18							
4	10								40							
3	2								24							
1	5								5						30	
1	5								5						1,024	
32	2								64						13	
1	2								2						10	
1	2								2						10	
1	2								2						30	
2	2								4						96	
3	4								12						5	
3	4								2						2	
1	2								2						20	
1	2								2						30	
1	2								2						32	
2	3								3						64	
1	5								5						5	
1	1								1						32	
1	1								2						15	
1	1								2						25	
1	1								3						8	
1	2								2						64	
2	5								10						9	
1	4								4							

Pharmaceutical purposes.

12 RETURN of Special Permissions for the importation of Intoxicating Liquors into the North-West Territories, &c.—Continued.

Permits.	Quantity of each Intoxicant in each Permit.							Total Quantities.							Remarks.		
	Whisky.	Brandy.	Wine.	Gin.	Rum.	Alcohol.	Beer.	Porter.	Whisky.	Brandy.	Wine.	Gin.	Rum.	Alcohol.		Beer.	Porter.
1	4		2			32			4			2				32	
1	10					32			10							32	
1	4		1			32			4		1					32	
26	2	2							52								
66	2		2						132		132						
5	1			1					5				6				
1	2	3							2	3							
16	1		1						16		16						
1	4	2							4	2							
11	1	1							11								
2	2	2							4		4						
1	5		10						5			4					
4	3		2						12		8						
4	5	2							20								
7	4		2						28								
1	4		1						4		14						
1	1		6						1		1						
1	1	1							1	6							
4	1	1	1						4	4							
1	1	5							1	10							
2	9	2	10						10		20						
2	5	2							6	4							
1	5		1						5		1						
3	2	1							6								
1	3	3							3		1						
1	5	3							3		3						
1	1	2	2						5		2						
1	1	6							1		6						
3	3	3							9		8						
1	1	2	2						1		2						
1	1	1							2		2						
1	2	1							14		7						
7	2								1		1						
1	1								1		1						
1	1								1		1						
1	1								1		1						
1	1								1		1						
1	1								1		1						
1	1								1		1						
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1	1								1		1						
1	1								1		1						
1	1					</											

[illegible]

RETURN of Special Permissions for the importation of Intoxicating Liquors into the North-West Territories, &c. — *Concluded.*

Permits.	Quantity of each Intoxicant in each Permit.							Total Quantities.							Remarks.	
	Whiskey.	Brandy.	Wine.	Gin.	Rum.	Alcohol.	Beer.	Porter.	Whiskey.	Brandy.	Wine.	Gin.	Rum.	Alcohol.		Beer.	Porter.
1	1	1	1	1	1	1	10		1			1			10	
2	2	2	2	2	2	2	2		2		2					
1	1	1	18						2		18					
1	1	1	2						2		2					
1	1	1	4						4		4					
1	1	1	3						6		6					
1	1	1	3						9		3					
2	2	2	2						2		2					
1	1	1	1						2		14					
14	14	14	1								178					
89	89	89	2								3					
3	3	3	3								40					
1	1	1	4								20					
10	10	10	5								12					
4	4	4	9								8					
2	2	2	8								10					
1	1	1	10								4					
2	2	2	2								8					
2	2	2	2								2					
4	4	4	1								1					
1	1	1	1								2					
1	1	1	1								8					
1	1	1	2								4					
1	1	1	1								2					
1	1	1	1								1					
1	1	1	2								5					
1	1	1	2								32					
1	1	1	1								14					
1	1	1	2								2					
1	1	1	1								40					
1	1	1	1								6					
4	4	4	8								32					
1	1	1	10								9					
61	61	61	10								190					
2	2	2	12								24					
1	1	1	13								13					
3	3	3	14								28					

[illegible]

REPORT OF THE BOARD OF EDUCATION FOR THE NORTH-WEST TERRITORIES, FROM THE CLOSE OF LAST SESSION OF COUNCIL, 18TH DECEMBER, 1885, TO THE 1ST OCTOBER, 1886.

(Presented by His Honor the Lieutenant Governor, Chairman Board of Education.)

BOARD OF EDUCATION,

REGINA, 25th October, 1886.

Gentlemen of the North-West Council

I have the honor to submit herewith the report of the Board of Education from the close of the last session of Council to 1st instant.

I would ask your special attention to the remarks of Mr. Inspector Grover, on page 27, with reference to the great need which exists for the establishment of a High School in the Territories, with a Training School for teachers attached, where the higher branches of education could be taught.

The Board entirely concurs in Mr. Grover's remarks, and recommends that the Council should, during this session, adopt some measure which would ensure the establishment, at an early date, of such an institution, without which no system of public education is complete.

I regret to inform you the Rev. Father Lacombe has placed in my hands his resignation as a member of the Board, as, owing to the large extent of the district over which he has to travel in the interest of his church, he feels his inability to attend our meetings with the regularity he would desire.

The Board will consequently in future be deprived of his valuable services, and it will devolve upon you, as provided by Ordinance, to appoint his successor before the close of the present session.

I have the honor to be, Gentlemen,

Your obedient servant,

E. DEWDNEY,

Chairman, Board of Education.

DEPARTMENT OF EDUCATION,

REGINA, 1st October, 1886.

To His Honor EDGAR DEWDNEY,

Lieutenant-Governor of the North-West Territories,

Chairman of the Board of Education.

SIR,—I have the honor to submit the following report of the proceedings of the Department of Education and of the organized school districts throughout the Territories, from the close of the last session of the North-West Council to the present date.

On the 31st December last there were 48 Protestant public, 10 Catholic public, and 1 Catholic separate, in all 59, school districts, established in the Territories. To-day there are 76 Protestant public, 12 Catholic public, and 2 Catholic separate, in all 90, school districts, an increase of 31. Petitions for the erection of 5 additional school districts have also been presented to your Honor.

This increase is no doubt due to the greater facilities for forming districts and the larger grants of assistance towards the support of schools provided by the Ordinance now in force.

As numerous enquiries have been made with reference to the educational system of the Territories, it has been thought that the following recital of the principal features of the Ordinance will most conveniently supply the desired information:—

SCHOOL DISTRICTS.

A Protestant or Catholic, public or separate, school district shall, at its erection, comprise an area of not more than thirty six square miles, its extreme limits being not more than nine miles apart, and shall contain not less than four resident heads of families, with a population of children of school age, that is to say, between the ages of five and sixteen, of not less than ten.

FORMATION OF DISTRICTS.

Three resident electors within an area as described above can form themselves into a committee to procure its erection into a school district, and may petition the Lieutenant-Governor for such erection. Giving at least 21 days' notice, they call a meeting of electors resident in proposed limits to decide if the majority are in favor of the erection of the district.

So soon as the majority of electors at this first school meeting have decided in favor of the erection of the school district, the electors present, by a majority of votes, elect from the resident electors in the school district three trustees.

On receiving the report of a first school meeting the Lieutenant-Governor, if the majority of the votes at the school district meeting has been in favor of the erection of the school district, proclaims the district a school district in accordance with the terms of the petition addressed to him in that behalf, and with such number as he may see fit.

Trustees are elected annually, except in the case of the trustees elected at a first school district meeting, who continue in office until the 31st day of October next ensuing the one following their election.

The school year is divided into two terms—a winter term and a summer term:—

(1) The winter term begins on the 1st day of November and ends on the 31st day of March in each year;

(2) The summer term begins on the 1st day of April and ends on the 31st day of October in each year.

In any school district where there are at least fifteen children of school age within a radius of one mile and a half from the school house, the public school for such district must be open during both the summer and the winter terms.

In cases where the school is only open for the summer term, such term constitutes the school year for the purposes of the attendance of the children and the report of the inspector.

The fiscal school year commences on the first day of November in each year, and all accounts opened during the preceding fiscal year shall, if possible, be closed at that date.

MEETINGS.

The annual meeting for the election of Trustees takes place on the second Monday of October in each year.

The annual meeting of the ratepayers of a school district takes place on the first Tuesday in November of each year. At this meeting the annual statements of the secretary, treasurer and teacher, and the annual report of the trustees are to be submitted in writing.

RELIGIOUS INSTRUCTION.

No religious instruction, such as Bible reading, or reciting, or reading or reciting prayers, or asking questions or giving answers from any catechism, is permitted in any public school in the North-West Territories from the opening of such school at nine o'clock in the forenoon until the hour of three o'clock in the afternoon, after which time any instruction, permitted or desired by the trustees of the district, may be given.

Any child attending any school whose parent or parents or guardian is or are of the religious faith different from that expressed in the name of such school district, has the privilege of leaving the school-room at the hour of three o'clock in the after-

noon, or of remaining without taking part in any religious instruction that may be given, if the parents or guardian so desire.

AID TO SCHOOLS.

To aid the trustees in meeting the current expenses of the school, the following grants are receivable by all organized school districts:—

(1.) Grants on account of teachers' certificates:

(a.) An annual grant of \$250 to every school employing a teacher, male or female, holding a provisional certificate from the inspector of schools for that district or a third-class certificate from a Normal school or the Board of Education;

(b.) An annual grant of \$300 to every school district employing a teacher, male or female, holding a second-class certificate from a Normal school or from the Board of Education;

(c.) An annual grant of \$350 to every school district employing a teacher, male or female, holding a first-class certificate from a Normal school or from the Board of Education.

(2.) Grants on account of attendance:

(a.) An annual grant of \$2.00 per child, per annum, to every school whose average attendance is at least eight, for every child who has attended school one hundred school days, where the school is only open during one term;

(b.) An annual grant of \$2.50 per child, per annum, to every school whose average attendance is at least eight, for every child who has attended school one hundred and sixty school days, where the school is open during both the winter and summer terms.

(3.) Grant on account of Inspector's report of school:

(a.) An annual grant of an amount not exceeding the total amount of the capitation grant for the attendance of children to every school district of whose school the inspector of schools shall report favorably.

(4.) Grants on account of additional teachers:

(a.) To every school district where the average daily attendance exceeds forty, a sum of one hundred and fifty dollars for an assistant teacher;

(b.) To every school district where more than one assistant teacher is employed, a grant of one hundred dollars for every assistant teacher employed after the first, where the average daily attendance shall be at least twenty for each teacher, the principal teacher included.

(5.) Grants to advanced classes:

(a.) To every school district employing a teacher holding a first-class certificate, a grant will be given to one group of pupils examined in the same subjects not being more than two subjects, at the rate of \$1 per child per subject. The examination to be in writing and conducted in the Inspector's presence, the examination papers to be provided by the Board of Education.

The grant on account of teacher's certificate is paid to the treasurer of the district quarterly, immediately after the thirty-first March, thirtieth June, thirtieth September and thirty-first December in each year; and the grants on account of attendance and inspector's reports are paid to the treasurer of the school district, annually, as soon as practicable after the thirty-first of October in each year.

BOARD OF EDUCATION.

The control and management of the educational interests of the Territories are vested in a board of education, appointed by the Lieutenant Governor in Council, and composed of five members, two of whom shall be Roman Catholics and two Protestants, and the Lieutenant Governor, who shall be chairman.

The duties of the Board are as follows:

(1.) To meet twice a year, at least, at Regina.

(2.) To appoint inspectors, who shall hold office during the pleasure of the Board, and to remunerate them for their services.

(3.) To appoint a board or boards of examiners for the examination of teachers, whose qualifications shall from time to time be prescribed by the Board of Education.

(4.) To provide for the expenses of the Board of Examiners.

(5.) To arrange for the proper examination, grading, and licensing of teachers, and the granting of certificates; such certificates to be of four classes, viz., a first, second and third-class certificate, and a provisional certificate.

(a.) Every such certificate of qualification shall have the signature of a member of the Board, but no certificate shall be given to any teacher who does not furnish satisfactory proof of good moral conduct.

(6.) To appoint a secretary to the Board, and to provide for his salary.

(7.) To make from time to time such regulations as they may think fit for the general organization of schools.

(8.) To make regulations for the registering and reporting of daily attendance at all schools.

(9.) To cause to be kept a proper record of the proceedings of the Board.

(10.) To determine all appeals from the decisions of inspectors of schools, and to make such orders thereon as may be required.

(11.) To prescribe the form of school register for all schools.

(12.) To make regulations for the calling of their meetings from time to time, and prescribe the notices thereof to be given to members.

The Board of Education shall resolve itself into two sections, the one consisting of the Protestant, and the other of the Roman Catholic members thereof, and it shall be the duty of each section:

(1.) To have under its control and management the schools of its section, and to make from time to time such regulations as may be deemed fit for their general government and discipline, and the carrying out of the provisions of this Ordinance.

(2.) To cancel the certificate of a teacher upon sufficient cause.

(3.) To select, adopt, and prescribe a uniform series of text books, to be used in the schools of the section.

The constitution of the present Board of Education is as follows:—

Chairman—His Honor the Lieutenant Governor.

Protestant Section—John Secord, Esq., M.N.W.C., Regina; Charles Marshallsay, Esq., M.N.W.C., Whitewood.

Catholic Section—C. B. Rouleau, S.M., M.N.W.C., Calgary; Rev. Father Lacombe, Calgary.

MEETINGS OF THE BOARD.

A meeting of the Board was held immediately after the close of last session of Council, when Mr. James Brown was appointed secretary of the Board.

The next meeting of the Board was held on 11th March last, when the following business was transacted:

The Territories were divided into the following inspectoral districts:—

Protestant Districts:

“Eastern Assiniboia,” from western boundary of Manitoba to Range 7 west of the 2nd Principal Meridian, inclusive;

“Western Assiniboia,” from Range 8 west of the 2nd Principal Meridian to the eastern boundary of Alberta;

“Calgary and MacLeod,” “Edmonton,” “Battleford,” and “Prince Albert.”

Catholic Districts:

“Assiniboia,” “Calgary and Macleod,” “Edmonton,” “Battleford” and “Prince Albert.”

The following appointments were made:—

INSPECTORS.

Protestant :

District.	Inspector.	Salary.
Eastern Assiniboia.....	John Hewgill, Esq.....	\$ 500
Western do	Thomas Grover, Esq	500
Calgary and Macleod.....	Rev. John McLean, B.A.....	100
Edmonton	Rev. A. B. Baird, M.A., B.D....	75
Battleford.....	P. G. Laurie, Esq.....	25
Prince Albert	Rev. Canon Flett.....	275

Catholic :

Assiniboia.....	Rev. Father Lebreton.....	50
Calgary and Macleod.....	J. W. Costello, Esq.....	25
Edmonton	Rev. Father Lestane	150
Battleford.....	E. E. Richard, Esq.....	25
Prince Albert	Rev. Father André.....	75

BOARD OF EXAMINERS.

The Rev. F. W. Pelly, St. John's College, Qu'Appelle, and the Rev. J. Hugonard, Industrial School, Fort Qu'Appelle, with a remuneration of \$100 each for their services for the first year.

The secretary was directed to send the following instructions to the Board of Examiners, Inspectors and boards of school trustees :

1. Memorandum of instructions to Board of Examiners :

That they prepare a syllabus of subjects for the examination of teachers for certificates to teach schools in the North-West Territories, and that the same be divided into four classes, viz. :

- (1.) Requirements of all candidates.
- (2.) do of candidates for 3rd class certificates.
- (3.) do do 2nd do
- (4.) do do 1st do

That the subjects for class (1) embrace reading, writing, spelling, and method of teaching.

That the subjects for class (2) embrace industrial drawing, English grammar, composition, English literature, history, geography and arithmetic.

That the subjects for class (3) embrace industrial drawing, English grammar, composition, English literature, history, geography, arithmetic, useful knowledge, (chemistry of common things, elements of botany, physics, 1st principles of agriculture) algebra, plane geometry and book-keeping.

That the subjects of class (4) embrace industrial drawing, English grammar, composition, English literature, history, geography, arithmetic, useful knowledge, algebra, plane geometry, practical mathematics, book-keeping and natural philosophy.

2. Regulations for the examination of candidates for teachers' certificates in the North-West Territories :

From the syllabus of subjects, prescribed by the Board of Education, the Board of Examiners shall prepare sets of examination questions on each subject. The set to be of a length and standard sufficiently to test, in the opinion of the examiners, the requisite attainments of the candidate, and also to be worked within the limited time available for the examination.

The necessary papers shall be sent by the Board of Examiners, by registered letter, to the inspector of schools, under seal, so as to be received by him in time for the examination.

All examinations shall be held in the most convenient school house, to be selected by the inspector, who shall make all suitable arrangements for holding the examination. It shall be obligatory on the trustees of any school district, upon application of the inspector, to place the school house at the disposal of the inspectors for the purpose of holding examinations.

Upon the examination day, the candidates being all seated in the places where they will work their examination papers, the inspector shall break the seal of the packet containing the questions in the presence of the candidates, and shall proceed to deliver a proper copy of the questions to each candidate. Blank paper, for answering the questions upon, shall be furnished to each candidate by the inspector. No book or means of reference whatever shall be allowed to be within the reach of any candidate, and any candidate availing himself of the means of reference, by whatever way obtained, or having any communication, during the hours of examination, with any one, except with the inspector in charge of the examination, will not be allowed to continue his examination at that time and place, and will be requested to leave the examination room.

The circumstances of such a case shall be reported by the inspector to the Board of Education.

The inspector shall not leave the examination room during the hours of examination.

If any candidate desires to leave the examination room, he must be requested to deliver up to the inspector the paper at which he was working, before he leaves, and be told at the same time he will not be allowed to resume the examination upon the subject of that particular paper which he had then given up.

One set of questions upon one subject only will be permitted to a candidate at one time.

At the close of the examination the inspector shall collect the examination papers of the candidates and forward them under seal to the Board of Education.

The inspector shall forward a memorandum of his charges and the expenses incident to the conduct of the examination to the Board of Education.

The Board of Examiners may make such further regulations for the proper carrying out of the above as they may deem fit, and shall at once report the same to the Board of Education.

3. Instructions to inspectors of schools:

INSTRUCTIONS TO INSPECTORS TO CARRY OUT THE PROVISIONS OF THE SCHOOL ORDINANCES NO. 3 OF 1885.

The Board of Education require inspectors of public schools to observe the following regulations, namely:—

Sec. Sub.
Sec.

82. 1. The inspector shall inspect each school in his district, at least once a year. This visit is to be made upon a date not earlier than the first day of August and not later than the thirtieth day of September in each year; fourteen days notice of the inspector's annual inspection of the school shall be given to the teacher. No notice is necessary for an inspector's *occasional* visit to a school. "Examine the pupils, etc.," not necessarily individually, but class by class in some of the subject in which the class has been instructed during the year, as shown by the "time table."
2. It is not desirable to examine the teacher at this time by a written examination, but by an oral one, and the inspector shall have the teacher examine a class before him.
3. Any serious irregularity in the conduct of a school is to be immediately reported to the board.

5. Inspectors shall notice that the books are selected from the authorized list, and that the pupils' books are in good condition.
6. Examinations of teachers for certificates shall be conducted by the inspector at one or more centres in his district, the place of examination being so fixed as to suit the greatest number of the candidates. Special instructions will be issued for the conduct of the examinations.
7. To report only upon the schedule issued by the board for that purpose. A copy of the endorsement referred to in 82-17, to be appended to this schedule.
8. The diary is to be ruled and kept according to the precedent supplied by the board, and an abstract of the same forwarded to the board at the close of the inspection tour.
10. The form of certificate supplied by the board is to be used and no other.
11. A careful inspection of the manner in which the school register is kept is very necessary. If the register is not well kept it should be specially remarked in the visitors' book, upon the scheduled report and by a suggestion to the school trustees.
13. Compare school building and school furniture and other essential particulars with the circular to trustees issued by the board, and, if any serious remedy is necessary, suggest the same to the trustees, and append the suggestions to the scheduled report to the board.
14. The board attaches great importance to the school "time table." Reading, writing, and arithmetic are to be taught once at least every day to every child of the age of seven years and over. There is no objection to drawing being alternated with writing, once during the week.
16. The report recorded in the visitors' book shall agree in all essential particulars with the scheduled report sent to the board.
17. The board recommends that the endorsement upon a teacher's certificate be made on the back thereof in the following manner:—
"1886—Aug. 16th. Inspected school. Excellent results.

"JOHN JONES, *Inspector of Schools.*"

Any of the terms "very good," "good," "very fair," "fair," or "moderate," may be used, instead of the term "excellent," at the discretion of the inspector, but the board requests that no other terms be substituted.

4. Terms upon which provisional certificates will be granted:—

Provisional certificates will be granted to teachers, not holding Normal school certificates, on their sending the following information to the inspector of schools for the district in which they are now teaching, or desire to teach in:—

- (1.) A recommendation from the board of trustees of the school district.
- (2.) Evidence of good moral character.
- (3.) Any certificate from school trustees or teachers as to competency.
- (4.) An application for the certificate in the applicant's own handwriting.

Such provisional certificate shall rank as a third-class certificate.

5. Circular to boards of school trustees *re* school buildings, &c.:

Of School Buildings and Furniture:—The size of the school building should be such as to allow 150 cubic feet of air for each sitting provided. *Example*, an attendance of twenty-two children requires a school room 24 feet by 18 feet by 12 feet. The height of the school room wall should be at least 10 feet.

TABLE FOR GRADUATING THE HEIGHT OF DESKS AND SEATS.

Age of Pupils.	Height of Chairs or Seats.	DESKS.				Space between Desks for Seats.
		Height of side next to pupil.	Length of		Width.	
			Double Desks.	Single Desks.		
5 to 6 years.	11 inches.	21½ inches	36 inches.	18 inches.	12 inches.	14 inches.
6 to 8 "	12 "	22 "	36 "	18 "	12 "	14 "
8 to 10 "	13 "	23 "	40 "	22 "	12 "	14 "
10 to 12 "	14 "	24½ "	45 "	24 "	15 "	17 "
12 to 14 "	15 "	26 "	46 "	24 "	15 "	17 "

A space of from 4 to 5 feet, extending across the room, should be left between the teacher's platform and the pupils' desks.

There should not be any windows in the rear of the teacher's platform, and little or no light should be admitted from the opposite side of the room. The desks should always be so placed that the pupils may face the entrance of the room.

Ventilation.—Without proper ventilation the school room must be an unhealthy place, and one pervaded by bad odours. Two separate flues from the ceiling, or the divisions of a single flue into several parts, are frequently employed. This plan secures an upward current through one and a downward current through the other, and causes a change of air in the room.

The schoolhouse should be located at a distance from all sources of malaria, such as swamps or stagnant water. A dry airy position commanding as attractive a prospect as natural facilities will permit, will be found best adapted for school purposes.

N.B.—In instances where the communications of the secretaries of school districts and others are not made upon the official form, furnished by the Board of Education, it is requested that they be made upon paper of *foolscap* size.

It was also resolved that the secretary of the board be paid a salary of \$60 per month out of the school funds.

At subsequent meetings, held on 12th March last, of the two sections of the board the following lists of books were adopted for use in the schools of the respective sections.

PROTESTANT.

List of books authorized by the Board of Education for use in the Protestant public schools in the North-West Territories:—

English—

Canadian Readers, published by W. J. Gage & Co., Toronto:

1st Primer, 6 cents.

2nd Primer, 10 cents.

2nd Book, 25 cents.

3rd Book, 40 cents.

4th Book, 50 cents.

5th Book, 60 cents.

6th Book, 90 cents.

Gage's Practical Speller, 30 cents.

Morrison's English Composition, 45 cents.

Miller's Swinton's Language Lessons, 25 cents.

Mason's outlines of English Grammar, 45 cents.

Mason's Advanced Grammar, 75 cents.

Spalding's English Literature, 90 cents.

Geography and History—

Page's Physical Geography, 90 cents.

Gage's Map Geography Primer, 40 cents.

Creighton's Epoch Primer of English History, 30 cents.

Creighton's Epoch Series of English History, 90 cts. (or in parts, 20 and 50 cts.)

Hughes' Canadian History, 20 cents.

Freeman's Europe (History Primer.)

Mathematics—

Kirkland & Scott's Elementary Arithmetic, 25 cents.

Hamblin Smith's Arithmetic, 75 cents.

McLellan's Mental Arithmetic, Part I., 30 cents; Part II. 45 cents.

Hamblin Smith's Elementary Algebra, 90 cents.

Pott's Euclid, Books I and II, 30 cents. Complete edition, 50 cents.

Hamblin Smith's Geometry, Books I. and II. 30 cents. Books II and III, 30 cents. Complete Edition, 60 cents.

Gage's Standard Book-keeping, 70 cents.

Writing and Drawing—

Gage's Copy Books, 5 and 10 cents.

Walter Smith's Primary Drawing Cards, 15 cts. per set.

do Intermediate Drawing Books, 10 cents.

Music—

Campbell's Canadian School Song Book.

Mason's National Music Readers, 1st, 2nd, 3rd and 4th.

Agriculture—

Agricultural Class Book, Published by the Irish Commissioners of National Education.

Books recommended for teachers' use, and for use of candidates preparing for teachers' certificates :

Baldwin's Art of School Management.....	\$1 05
McLellan's Teachers' Handbook of Algebra.....	1 25
McLellan & Kirkland's Examination Papers in Arithmetic.....	0 75
Hughes Topical History of England.....	0 30
do History of Canada.....	0 20
do Drill and Calisthenics.....	0 40
Walter Smith's Primary Drawing Manual.....	0 50
do do Intermediate Manual.....	1 25
Buckton's Health in the House.....	0 90
Browning's Educational Theories.....	1 00

CATHOLIC.

List of books authorized by the Board of Education for use in the Roman Catholic schools in the North-West Territories:—

Published by.

Price.

	Primer.....	\$0 05
	1st Book "Metropolitan".....	0 17
Sadlier's	2nd do do.....	0 25
Montreal and	3rd do do.....	0 35
New York.	4th do do.....	0 45
	5th do do.....	0 75
	Lennie's Grammar Principles.....	0 13
Christian	Primary Geography (illustrated).....	0 30
Brothers of	Sacred History.....	0 17
Montreal.	History of Canada.....	0 17
Board of Education	Spelling Charts (10 sheets).....	0 40
Prov. of Quebec.	Butler's Catechism.....	0 06

Intermediate Course.

Sadlier's	Metropolitan Grammar.....	0 35
Christian Brothers of Montreal.	Int. to Commercial Arithmetic T. P. B.....	0 45
Sadlier's.	Intermediate Geography T. P. B.....	0 45
Copp, Clark & Co., Toronto.	History of Canada T. P. B.....	0 30
	Lynch's Catechism.....	0 13
	Ryerson's Agriculture.....	0 50
	Webster's Dictionary.....	0 45

Superior Course.

A. S. Barnes, New York.	Bown's Grammar.....	1 00
Christian Bros., Montreal.	Commercial Arithmetic T. P. B.....	0 45
A. S. Barnes & Co., New York.	Illustrated Geography (20 maps) T. P. B.....	1 75
Murphy & Co., Baltimore.	Davis' Algebra.....	1 50
	Todhunter's Euclid.....	1 50
	Lingard's History of England.....	1 60
	Catechism of Perseverance.....	0 60

The next meeting of the Board was held on 22nd April last, to which meeting the Board of Examiners was invited to be present, in order that a more perfect system might be arranged for the examination of teachers for certificates.

The following regulations were adopted and the secretary instructed to have same printed and distributed, viz.:—

REGULATIONS of the Board of Education for the North-West Territories, for the examination of candidates for certificates to teach in the schools of the Territories. Adopted 22nd day of April, 1886.

Examinations of candidates for certificates shall be held on the second Tuesday of August and on the second Tuesday of January in each year, at such places as may be decided upon by the school inspectors, of which due notice will be given.

Two months' notice of their intention to attend the examination shall be given by candidates to the inspector of schools for the district in which they intend to be present for examination.

One month's notice of the number of candidates for each grade of certificate who purpose attending the examination, shall be given by the inspectors to the Board of Examiners.

The certificates granted by the Board of Education shall be graduated as follows:—

- First-class, two grades, A and B.
- Second-class, two grades, A and B.
- Third-class, one grade

RULES TO BE OBSERVED BY CANDIDATES.

(1.) Candidates, in preparing their answers, shall write on one side only of each sheet, placing the number of each page at the top in the right hand corner. Having written his name at the bottom of each page, and having arranged his answer papers in the order of the questions, each candidate shall fold his papers *once* across from the bottom upward, and write on the outside, on separate lines, (1) the name of the place of examination, (2) his name, (3) the class of certificate for which he is a candidate, and (4) the name of the subject.

(2.) Candidates shall be in their places punctually at the appointed time, and shall, when the order to stop writing is given, obey it immediately. No candidate shall be permitted to make any alterations in his answers after they are once handed in, or to put in supplementary answers, and no extra time shall be given those who arrive late.

(3.) In the event of a candidate copying from another, or allowing another to copy from him, or taking into the room in which the examination is held any books, notes or anything from which he can derive assistance in the examination, it shall be the duty of the presiding inspector, if he obtains clear evidence of the fact, at the time of its occurrence, to cause such candidate at once to leave the room; neither shall such candidate be permitted to enter during the remaining part of the examination, and his name shall be struck off the list of candidates. If, however, the evidence of such copying be not clear at the time, or if it be obtained after the conclusion of the examination, the inspector must report the case to the Board of Education.

(4.) Each candidate shall, upon the first day of examination, hand to the presiding inspector a slip of paper containing the following information:—

1. Age on last birthday.
2. Kind of certificate last held (if any), and where obtained.
3. Name of Normal School (if any) where trained.
4. Length of experience in teaching.
5. Name and address of person signing certificate of moral character.
6. Candidate's name in full.
7. Candidate's post office address.

SUBJECT OF EXAMINATION.

First-Class.

The subjects of examination for first-class certificates shall be as follows:—

Reading: To be able to read intelligently and expressively any extract in prose or verse.

Spelling: To be able to write correctly from dictation an extract from any author; the papers written on the other subjects must also be free from orthographical errors.

Writing: To be thoroughly acquainted with the principles of penmanship and to be able to write a good running hand.

English Literature: To have a general acquaintance with English literature and its history, and to be able to give a critical analysis of a play from Shakespeare, or a work of some other author assigned for examination from time to time by the Board.

Grammar: To be thoroughly acquainted with the origin and construction of the English language and to show familiarity with its correct use in speaking and writing.

Composition: In addition to the work for second-class, to show, by passing an examination on this subject and by the character of their answers on other subjects, an acquaintance with the rules of Rhetoric and a habit of writing English with clearness, force and taste.

Geography: To have a thorough knowledge of the mathematical, physical and political geography of the world.

History: As for second-class, together with Green's Shorter History of the English People.

Book-keeping: To be acquainted with single and double entry.

Arithmetic and Mensuration: To have a thorough knowledge of Arithmetic and the mensuration of surfaces and solids.

Algebra: To the Binomial Theorem, inclusive, in Todhunter's large Algebra.

Euclid: Books I, II, III, IV, and VI and the definitions of Book V, with deductions.

Statics, Hydrostatics and Physics: As contained in the prescribed text books.

Physiology and Hygiene: As for second-class, with a knowledge of the brain and the nervous system.

Chemistry and Botany: As contained in the prescribed text books.

Books prescribed and recommended for the use of candidates for first-class certificates:—

Spalding's History of English Literature; Mason's English Grammar; Bain's Rhetoric and Composition; Green's Shorter History of the English People; Withrow's Canadian History; Kirkland's Elementary Statics; Hamblin Smith's Elementary Hydrostatics; Balfour Stewart's Elementary Physics; Gray's How Plants Grow; Huxley's Elementary Physiology; Bucton's Health in the House; Roscoe's Elementary Chemistry; Todhunter's Algebra; McLellan's Teachers' Handbook of Algebra; Page's Physical Geography; Pott's Euclid.

For Roman Catholic candidates, in place of Green's Shorter History of the English People. Lingard's History of England, and Catechism of Perseverance.

Books for French candidates:

Littérature Française et Anglaise; Grammaire Française de l'Académie; Rhétorique et Composition; Histoire d'Angleterre (Drouin); Histoire du Canada (Garneau); Éléments de Physique; Éléments de Botanique (Provancher); Algèbre, Géométrie, et Trigonométrie, Arithmétique en toutes ses parties (Frères des Écoles Chrétiennes); Analyse grammaticale et logique; Terme des Livres et partie double et en partie simple; Géographie mathématique, physique et politique (Holmes); Histoire Sainte; Catéchisme de Persévérance.

SECOND CLASS.

The subjects of examination for second-class certificates shall be as follows:—

Reading: As for first-class.

Spelling: As first-class.

Writing: As first-class.

English Literature: To be acquainted with the outlines of the history of English Literature and to be familiar with the work or works of some English author, assigned from time to time for special preparation.

Grammar: To be acquainted with grammatical forms and the rules of Syntax, and their correct application to the use of language in speaking and writing.

Composition: In addition to the work for third-class, to show by the composition of abstracts, paraphrases or essays an acquaintance with the rules of punctuation, and a fair mastery of the art of writing good English.

Geography: Mathematical, physical and political.

History: To be thoroughly acquainted with the history of England and Canada.

Book-keeping: By single and double entry.

Arithmetic: A thorough acquaintance with the subject.

Algebra: To the end of Quadratic Equations.

Euclid: Books I and II with deductions.

Physiology and Hygiene: To be acquainted with the processes of digestion, circulation and respiration, and to be familiar with the ordinary laws of health.

Books prescribed and recommended for the use of candidates for second-class certificates:—

Stopford Brooke's English Literature; Mason's Outlines of English Grammar; Abbott's How to Write Clearly; Huxley's Elementary Physiology; Catharine Bucton's Health in the House; Page's Physical Geography; Collier's History of the British Empire; Jeffers' History of Canada; Beatty & Clare's Book-keeping; Todhunter's Algebra for Beginners; Pott's Euclid.

For Roman Catholic candidates, in place of Collier's History of the British Empire and Jeffers' History of Canada, Lingard's History of England, A.D., 1066-1272, Christian Brothers' of Montreal History of Canada, and Butler's Catechism.

Books for French candidates:

Lecture raisonnée; Écriture; Grammaire: Géographie; Éléments d'Algèbre, Éléments de Géométrie (Frères des Écoles Chrétiennes); Histoire d'Angleterre (Drouin); Histoire Sainte (Drouin); Histoire du Canada (Garneau); Catéchisme de Persévérance.

THIRD CLASS.

The subjects of examination for third-class certificates shall be as follows:—

Reading: To be able to read any passage selected from the authorized reading books intelligently and expressively.

Spelling : To be able to write correctly any passage that may be dictated from the authorized readers.

Writing : To be able to write legibly and neatly.

Grammar : To be acquainted with the elements of English Grammar, and to be able to analyze and parse any ordinary prose sentence.

Composition : To be acquainted with the construction of sentences, the rendering of poetry into prose, the forms of business and general correspondence, and the writing of themes.

Geography : To be acquainted with the general geography of the world, and of America and Europe in particular; and to have a good general knowledge of the form and motions of the earth, and their connection with climate, the seasons and the divisions of time.

History : To have a good general knowledge of the History of England and Canada.

Arithmetic : To be thoroughly acquainted with the subject as far as percentage, including interest and discount.

Books prescribed and recommended for study by candidates for third-class certificates:—

Mason's Outlines of English Grammar; Morrison's English Composition; Campbell's Geography; Collier's School History of the British Empire; Jeffers' History of Canada (primer); Hughes' Topical Histories of England and Canada; Hamblin Smith's Arithmetic.

For Roman Catholic candidates, in place of Collier's History of the British Empire and Jeffers' History of Canada, Lingard's History of England, A. D. 1066-1215, Christian Brothers of Montreal History of Canada, and Butler's Catechism.

Books for French Candidates.

Livres de Lecture, 1er, 2nd, 3e, 4e et 5e (J. B. Rolland, Montreal); Grammaire Française et Analyse (Frères des Écoles Chrétiennes); Exercices Orthographiques; Grammaires avec exercices; Géographie Primaire (Frères des Écoles Chrétiennes); Arithmétique (F. X. Touissant); Histoire Sainte (Drouin); Histoire du Canada (Laverdière); Écriture.

PERSONS ELIGIBLE TO RECEIVE THE VARIOUS GRADES OF CERTIFICATES.

A first-class certificate will be granted by the Board of Education of the North-West Territories, as follows:—

(1.) To any candidate producing a first-class certificate from any Normal School, or a first-class professional certificate.

(2.) To any candidate producing a second-class certificate from any Normal School and passing the examination of the Board of Examiners of the North-West Territories for a first-class certificate.

(3.) To any candidate holding a second-class certificate from the Board of Education of the North-West Territories and passing the examination of the Board of Examiners for a first-class certificate and producing the Inspector's report of the candidate's school, showing that his method of teaching has been graded "excellent."

(4.) To any candidate who is a graduate of a British or Canadian university and who furnishes evidence to the satisfaction of the Board of Examiners of having taught a school for at least two years.

A second-class certificate will be granted as follows:—

(1.) To any candidate producing a second class certificate from any Normal School, or a second class professional certificate.

(2.) To any candidate producing a third class certificate from any Normal School and passing the examination of the Board of Examiners for a second-class certificate.

(3.) To any candidate holding a third-class certificate of the Board of Education of the North-West Territories and passing the examination of the Board of Examiners for a second-class certificate and producing the inspector of schools'

report of the candidate's school, showing that his method of teaching has been graded "very good" or "good."

(4.) To any candidate who is a graduate of a British or Canadian university and who furnishes evidence to the satisfaction of the Board of Examiners of having taught a school for at least one year.

A third-class certificate will be granted as follows:—

(1.) To any candidate producing a third-class certificate from any Normal School, or a third-class non-professional certificate.

(2.) To any candidate producing a provisional certificate and passing the examination of the Board of Examiners for a third-class certificate and producing the inspector of schools' report of the candidate's school showing that his method of teaching has been graded "very fair" or "fair."

(3.) To any candidate who is a graduate of a British or Canadian university.

At same meeting the secretary was instructed to invite tenders for 100 each of the following maps, to wit:

1 map of the World, 1 map of the Dominion of Canada, 1 map of the Continent of America, 1 map of Europe, 1 map of Asia, 1 map of Africa; 100 globes, 12, 15 or 18 inches; 1,000 double desks for pupils, 100 teachers' desks, and other school material found necessary.

In accordance with the above instructions, tenders were invited and a meeting of the Board called for 1st June last, to open the tenders and award same.

On opening tenders at said meeting, the following tenders were accepted:—

W. F. Wilson, Brandon, for 100 teachers' desks.....	\$ 661 25
J. H. Ashdown, Winnipeg, for 1,000 pupils' desks.....	2,986 00
S. R. G. Pearson & Co., Toronto, for 100 maps of the Dominion.....	360 00
W. J. Gage & Co., Toronto, for 100 maps of North and South America, combined; 100 Maps of Europe; 100 maps of Asia; 100 maps of Africa; 100 maps of the World, on Mercator's projection; 100 sets of spelling and reading charts; 100 globes.....	2,265 00

Total contracts awarded.....	<u>\$6,272 25</u>
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The Board next met on 27th July; but on account of the illness of His Honor the Lieutenant-Governor, the meeting was adjourned until next day.

On 28th July the Board met, and had a meeting with the Hon. Thomas White, Minister of the Interior, in connection with a proposition that a high school, with a training school for teachers attached, should be erected at Regina.

Mr. White promised to give attention to the matter on his return to Ottawa.

On the following day, the Board met at Government House, when His Honor the Lieutenant-Governor was able to be present, and the following business was transacted:

Taking into consideration the exceptional circumstances of the case, a grant of \$100 was given to Little Pipestone School District, to aid in rebuilding the school-house, which had been burnt down by incendiaries.

The Rev. D. Lewis, Church of England minister at Fort Qu'Appelle, was appointed member of the Board of Examiners, *vice* the Rev. F. W. Pelly, who had resigned on account of ill-health.

It was determined to postpone the first examination of candidates for certificates till the second Tuesday in January next, as owing to Mr. Pelly's resignation having been received so late in the season, it would be impossible to have papers prepared for an examination, in order that certificates could be issued to successful candidates in time to be available for the present term, which ends on the 31st October instant.

It was also resolved that Shakespeare's "Merchant of Venice" be assigned as the work in English literature for candidates for first-class certificates, and that Scott's "Lady of the Lake" be assigned as the work in English literature for candidates for second-class certificates.

List of School Districts authorized to borrow money by the issue of debentures, for the purpose of building and furnishing school houses:—

Indian Head.....	P.P.S.D. No. 49.....	\$1,200
Eden Grove.....	do 21.....	500
Revine Bank	do 27.....	400
Summerberry	do 33.....	450
Fairfield.....	do 46	700
Wapella.....	do 11.....	550
Fleming.....	do 45.....	500
Moosomin.....	do 12.....	1,000
Poplar Grove.....	do 31.....	500
Faulkner.....	do 53.....	300
Abbottsford.....	do 37.....	400
Mount Pleasant.....	do 39.....	600
Thistle.....	do 32.....	450
Wide Awake.....	do 54.....	700
Qu'Appelle	do 2.....	1,600
Summerhill.....	do 34	400
Greenville.....	do 36.....	250
Meadow Lea.....	do 55.....	200
St. John.....	do 16.....	800
Park	do 20.....	700
Sunnymead.....	do 38.....	600
Buffalo Head	do 60.....	300
Boggy Creek	do 64.....	500
Victoria Plains	do 67... ..	650
Spring Coulee	do 59.....	550

Provisional certificates were granted to the following teachers:—

Rebecca A. Webster	Francis B. McDougall
Henry Newmarch	Alexander McKellar
John W. McPhail	John W. Kenyon
Sarah M. Moffatt	Eliza Boulding
E. C. Stewart	Henry Blanc
Victoria E. Burns	Alfred Arcand
Robert McMillan	Sarah Cowan
Maggie Huckerby	Lottie Cowan
Thomas D. Acheson	Arthur E. Cox
Roxy Alexander	Sister Mary Green
Mrs. James Moore	Sister Augustine Higgins
Mrs. Ann Reeve	Sister Stanislaus Poiret
H. O. Partridge	William Gerrond
Edward Cumming	Samuel M. Marsh
Mrs. Jessie McNiece	Robena McGregor
Nellie Jaffray	Vincent R. C. Hutcheson
Clara A. Powell	Grace C. Hutchinson
Lillie Grier	Melissa Jefferson
Jacob Brookfield	E. F. Guainans
Lawrence B. Latimer	Clara Givin
Thomas J. Irwin	Minnie Fotheringham
John Young	Rev. Father Zachary Touze.

List of Schools established in the Territories, showing Number in each Inspectoral District.

PROTESTANT SCHOOLS IN EASTERN ASSINIBOIA. J. HEWGILL, INSPECTOR.

Name of District.	No.	Name of Teacher.	Class of Certificate.	No. of Pupils on Register.	No. of Pupils present on day of Inspection.	P. O. Address.	General Tone of Inspector's Report.
Broadview	5	Mrs. A. Painter.....	None....	34	10	Broadview.....	Very unsatisfactory.
Wapella.....	11	Miss G. E. Dodson.....	3rd.....	25	10	Wapella.....	Very fair.
Moosomin.....	12	Thos. Dickie.....	2nd.....	65	26	Moosomin.....	Good.
Little Pipestone.....	14	J. W. McPhail.....	Pro.....	23	21	Glen Adelaide.....	do
Montgomery.....	15	Not open.....	Pro.....	16	5	Montgomery.....	Fair.
*St. John.....	16	H. Newmarch.....	do.....	20	11	Whitewood.....	Very fair.
*Park.....	20	J. O. Callin.....	do.....	15	12	Wapella.....	Fair.
Eden Grove	21	Miss Clara Givin.....	do.....	15	12	Rocanville.....	Inspector reports school not open, but a log school house is now in course of erection.
Rocanville.....	22	Not open.....	do.....	15	12	Wapella.....	Very fair.
Revine Bank.....	27	R. McMillan.....	Pro.....	32	26	Wapella.....	Fair.
*Sunnymead.....	38	Miss M. Huckerby.....	do.....	23	8	1/2 Whitewood.....	do
Hillburn.....	43	Miss R. A. Webster.....	do.....	21	9	Hillburn.....	do
J. Young.....	45	J. Young.....	3rd.....	24	9	Fleming.....	Very encouraging.
Fleming.....	46	Miss Nellie Jaffray.....	Pro.....	19	10	do.....	Very satisfactory.
Fairfield.....	53	G. E. Cummins.....	do.....	13	11	Grenfell.....	Good.
Faulkner.....	55	Mrs. J. McNiece.....	do.....	9	5	Broadview.....	Very fair.
Meadow Lea.....	56	T. J. Irwin.....	do.....	14	9	do.....	Fair.
Lansdowne.....	57	Miss L. M. Moffatt.....	do.....	24	19	Whitewood.....	Very fair.
*Whitewood.....	58	Not open.....	do.....	24	19	Rocanville.....	Inspector does not think this district will be opened for some time.
Ivy.....	58	Not open.....	do.....	24	19	Whitewood.....	Very fair.
Buffalo Head.....	60	Miss M. Jefferson.....	Pro.....	14	11	Carlyle.....	Fair.
Rillington.....	62	Mrs. A. Reeve.....	do.....	17	14	Grenfell.....	Very fair.
Dalesboro'.....	69	Sch'l house being erected.....	do.....	17	14	Dalesboro'.....	Not open.
Golden Plain.....	70	.....	do.....	17	14	Sunnymead.....	do
Kinbrae.....	73	.....	do.....	17	14	Kinbrae.....	Just proclaimed.
Derry Grove.....	74	.....	do.....	17	14	Fairmeade.....	do

* Schools open for both terms.

No. of schools in operation, 18

No. of pupils on registers, 407.

List of Schools established in the Territories, showing Number in each Inspectoral District.—Continued.

PROTESTANT SCHOOLS IN WESTERN ASSINIBOIA. THOS GROVER, INSPECTOR.

Name of District.	No.	Name of Teacher.	Class of Certi- ficate.	No. of Pupils on Register.	No. of Pupils present on day of Inspection.	P. O. Address.	General Tone of Inspector's Report.
*Moose Jaw.....	1	Jas. N. McDonald	2nd	76	63	Moose Jaw.....	Highly satisfactory.
*Qu'Appelle.....	2	J. W. Peters	2nd	83	42	Qu'Appelle Station	Excellent.
*Regina.....	4	D. S. McVannell.....	do	161	94	Regina.....	Most encouraging; saw marked improvement since former visit.
*Kenia.....	6	Miss M. Kerr	do	15	12	Kenia.....	Very good.
*Wolseley	25	Miss R. L. Douglas.....	3rd	45	20	Wolseley	Good.
*Fort Qu'Appelle.....	26	Mrs. V. E. Burns.....	2nd	20	6	Fort Qu'Appelle.....	Encouraging.
*Maple Green.....	28	Miss M. Armstrong.....	Pro	28	19	Kenia.....	Fair. Former teacher away on day of inspec- tion.
*Wascana.....	29	Since date of inspection. Miss S. Cowan	do	10	6	Via Regina.....	Children progressing fairly. Inspector recom- mends that this school amalgamate with some neighboring district, owing to small number of resident pupils.
Round Plain.....	30	Edward Fee	2nd	19	8	Wishart.....	Very good.
Poplar Grove.....	31	H. A. Ross.....	3rd	11	9	Wolf Creek.....	do
*Thistle.....	32	Mrs. J. H. Moore.....	Pro	13	7	Summerberry	Very fair.
Summerberry.....	33	J. F. Middlemiss.....	2nd	19	17	do	Very good.
Summerhill.....	34	T. D. Acheson.....	3rd	29	19	do	do
Westfield	35	Robt. G. Fleming.....	None.....	17	13	do	Not very encouraging. Teacher without any experience.
Greenville	36	Miss Fotheringham.....	Pro	8	8	Wolf Creek.....	Very fair.
Abbotsford	37	A. T. Fotheringham.....	2nd	29	20	do	Good.
Mount Pleasant.....	39	Miss U. Bulyea.....	do	20	16	Edgeley Farm	do most encouraging.
*Bonnycastle	40	E. A. Partridge	Pro	31	25	Katepwe.....	Highly satisfactory.
Phoenix Forks	48	John W. Kenyon	3rd	25	7	Phoenix Forks.....	Good.
*Indian Head	49	Miss C. Barnes.....	2nd	36	26	Indian Head	Encouraging.
*Spring Brook	50	.....	.....	.....	.....	Fort Qu'Appelle.....	Not open.
*Caron	52	Miss R. Alexander.....	Pro	14	13	Caron	Good.
*Wide Awake.....	54	Miss C. Powell.....	3rd	25	12	Indian Head	Encouraging
Spring Ooulee	59	H. O. Partridge	Pro	15	6	Sinaluta	Very encouraging.
McLean	61	.....	.....	.....	.....	McLean	Not open.
Pasqua	63	J. Brookfield.....	Pro	15	6	Pasqua	Moderate.
Boggy Creek	64	A. McKellar.....	do	15	10	Via Regina.....	Fair progress being made.

Prospect.....	65	Miss F. B. McDougall.....	do .....	.....	Grenfell School.....	Very discouraging. Closed on the 7th August, teacher having left.
Tregars.....	66	Miss E. A. F. Boulding.....	do	13	Va Regina.....	Only moderate progress being made.
Victoria Plains.....	67	S. B. Jameson.....	2nd	20	do	Healthy and encouraging.
Lake View.....	68	Miss L. Cowan.....	Pro	8	Craven P.O., <i>via</i> Regina.....	Fair progress
Red Fox Valley.....	72	J. Drinnan.....	.....	102	Sinclair.....	Not open.
Medicine Hat.....	76	.....	.....	.....	Medicine Hat.....	Just proclaimed.

* Schools open for both terms. No. of schools in operation, 29. No. of pupils on register, 826.

PROTESTANT SCHOOLS IN CALGARY AND MACLEOD DISTRICTS. REV. J. McLEAN, B.A., INSPECTOR.

Calgary.....	19	{ Joseph Boag.....	1st.....	88	Calgary.....	Excellent progress being made.
Macleod.....	47	{ Miss Rose Watson.....	3rd.....	26	Fort Macleod.....	Most encouraging.
Lethbridge.....	51	{ Miss Gillie Grier.....	Pro	56	Lethbridge.....	Most satisfactory progress being made, considering lack of accommodation.

† Schools open for both terms. No. of schools in operation, 3. No. of pupils on registers, 170.

PROTESTANT SCHOOLS IN EDMONTON DISTRICT. REV. A. B. BAIRD, M.A., B.D., INSPECTOR.

Edmonton.....	7	W. H. Carson.....	Pro	73	Edmonton.....	Good.
Belmont.....	23	J. B. Steele.....	3rd.....	43	do	Very good.
Sturgeon.....	24	Mrs. M. Inglis.....	1st.....	14	do	do
Victoria.....	75	.....	Scotch.....	11	Victoria.....	Just proclaimed.

No. of schools in operation, 3. No. of pupils on register, 130. *Small attendance on account of prevalence of measles in the district.

PROTESTANT SCHOOLS IN PRINCE ALBERT DISTRICT. REV. CANON FLETT, INSPECTOR.

Prince Albert.....	3	J. F. A. Stull.....	1st.....	69	Prince Albert.....	Very good.
St. Andrews.....	8	Wm. Gerrard.....	Pro	53	do	Very good results.
Colleston.....	9	V. R. C. Hutcheson.....	do	19	do	Good
Prince Albert East.....	10	Miss G. C. Hutchinson.....	do	33	do	Very good.
Saskatoon.....	13	.....	.....	45	Saskatoon.....	Good; school closed temporarily; no teacher.
Red Deer Hill.....	17	Hugh Roger.....	2nd.....	19	Prince Albert.....	Very good; many pupils absent owing to prevalence of whooping cough.
St. Catharines.....	18	Miss R. McGregor.....	Pro	43	do	Good.
Lindsay.....	44	Rev. H. W. Atwater.....	2nd.....	61	Kirkpatrick.....	Very good.
Kinisteno.....	42	S. M. Marsh.....	Pro	13	Kinisteno.....	Very fair.
Island Lake.....	44	J. C. Slater.....	2nd.....	19	Prince Albert.....	Good.

No. of schools in operation, 10. No. of pupils on register, 374.

List of Schools established in the Territories, showing the Number in each Inspectorial District.—Continued.

PROTESTANT SCHOOLS IN BATTLEFORD DISTRICT. P. G. LAWRIE, INSPECTOR.

Name of District.	No.	Name of Teacher.	Class of Certificate.	No. of Pupils on Register.	No. of Pupils present on day of Inspection.	P. O. Address.	General Tone of Inspector's Report.
†Battleford.	71	.....	.....	34	.....	Battleford .....	.....
† Schools open for both terms.							

ROMAN CATHOLIC SCHOOLS IN CALGARY DISTRICT. J. W. COSTELLO, INSPECTOR.

†Lacombe.	1 C.S.	Sr. Mary Greene Sr. Stanislaus Poirer Sr. Anna O'Neill Sr. Faustine Carroll Sr. Etheburga Clarks'n...	Pro Pro	106	45	Calgary	Very good.
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ROMAN CATHOLIC SCHOOLS IN EDMONTON DISTRICT. REV. FATHER LESTANG, INSPECTOR.

†Saskatchewan	2 C.P.	Mary Curran	Pro	25	15	Fort Saskatchewan.	Very good.
†St. Albert.	3 C.P.	{ Rev. Sister Dillon { Rev. Marie des Anges { Miss Aurelia Cardinal	Pro 1st	77	77	St. Albert	Excellent.
†St. Leon.	4 C.P.	Henry Blanc	Pro	25	25	do	Good.
†Cunningham	5 C.P.	J. F. Quevillon.	1st.	55	46	do	Excellent.
†Bellerose	6 C.P.	{ Jos. Blodeau { Alfred Arcand	Pro do	24	.....	do .....	.....
†St. Francois Xavier	7 C.P.	.....	.....	.....	.....	Edmonton.....	.....
No. of schools in operation, 5.				No. of pupils on register, 206.			

Could not inspect this school on account of sickness of the children.
School closed for about a year.

ROMAN CATHOLIC SCHOOLS IN PRINCE ALBERT DISTRICT. REV. FATHER ANDRÉ, INSPECTOR.

Belleve.....	1 O.P.....	.....	.....	.....	Batoche.....	.....	Not open.
†Stobart.....	8 C.P. Rev. Z. Touze.....	.....	22	22	Stobart.....	.....	Very encouraging.
†St. Laurent.....	9 C.P. Rev. Père Fourmond.....	1st.....	26	26	St. Laurent.....	.....	Excellent.
†Lourdes.....	10 C.P. Octave Regnier.....	2nd.....	14	14	St. Louis de Langevin.....	.....	Good.
No. of schools in operation, 3. No. of pupils on register, 62.							

ROMAN CATHOLIC SCHOOLS IN ASSINIBOIA. No Inspector at present.

†Lebret.....	12 C.P. E. F. Guainans.....	Pro.....	51	.....	Fort Qu'Appelle.....	.....
†Benbecula.....	2 C.S. Rev. Father Gillies.....	1st.....	27	.....	Wapella.....	.....
No. of schools in operation, 2. No. of pupils on register, 78.							

ROMAN CATHOLIC SCHOOL IN BATTLEFORD DISTRICT. E. RICHARD, INSPECTOR.

†St. Vital of Battleford...	12 C.P. Miss Dorval.....	1st.....	60	34	Battleford.....	.....	Very favorable.
† Schools open for both terms.							

From the preceding tables it will be seen that sixty-four Protestant schools are in operation with an attendance of 2,041, as per registers. If to this number is added the estimated school population of the twelve schools erected, but not yet opened, say 224, it appears that the seventy-six Protestant school districts have a school population of 2,265.

The twelve Catholic schools in operation have an attendance of 512 per registers. If the estimated school population of the two Catholic schools erected, but not yet opened, say 27, be added, the school population of the fourteen Catholic school districts will amount to 539.

The estimated school population of the five proposed new districts, petitions for which are now pending, is 140. Adding this number to the above figures it indicates that we will soon have about 3,000 pupils attending the organized schools.

I regret that it is impossible for me to state at present the average attendance at each school, as this information cannot be obtained until the end of the school year (31st October) when the registers are closed and sent to this office.

I have appended hereto several extracts from inspectors' reports, which, apart from their official returns, will place the Board in possession of a considerable amount of valuable information regarding the general state of education throughout the Territories.

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

JAS. BROWN,
Secretary, Board of Education.

APPENDIX.

EXTRACTS FROM THE FIRST ANNUAL REPORTS OF THE INSPECTORS OF SCHOOLS.

EASTERN ASSINIBOIA PROTESTANT SCHOOLS.

On the whole I have found the schools in a satisfactory state; and although, in nearly all cases, I found the teachers laboring under difficulties, because they were not supplied with the necessary paraphernalia, which assists so materially in making teaching a success, yet, I also found that the teachers, nearly without exception, had gone to work with a determination to do the best they possibly could. I have never failed, where I found a school in want of a black-board, to bring the matter forcibly before the trustees, not only through the medium of the visitors' book, but by a direct communication.

I have recommended for black-board use, ordinary green window-blind paper, cheap, durable, and much nicer than the common black-board. In my experience in some of the best public schools of Ontario, it is used exclusively, and in fact in one case pasted over the black wall, giving the room a more cheerful appearance, and being without a single objectionable feature. I might also refer to the Collingwood (Ont.) Collegiate Institute, where it has been in continuous use for years.

JOHN HEWGILL,
Inspector.

WESTERN ASSINIBOIA PROTESTANT SCHOOLS.

I have the honor to report that I have visited the various organized school districts within my inspectorate, and with the exception of two have found them all open, with an aggregate attendance of over 800 pupils, as shown by registers, giving each school an average of 30.

I am pleased to state that while all the schools are doing fairly good work, considering the short time they have been in operation and the disadvantages necessarily attending the same in a new and sparsely settled country, a number are doing excellent work, where the trustees have been fortunate enough to secure the services of educated and experienced teachers. In a few cases I found good teachers who had no previous experience, but were gifted with a natural aptitude for teaching.

We have several schools that will compare favorably with some town and rural schools in the older provinces, a fact not in the least surprising when we consider the enterprising and intelligent spirit of the people who have made homes in the "lone land," in whose vocabulary there is no such word as "failure." The children of such parents are imbued with the same progressive nature, and manifest an interest in their studies most encouraging. Of course, as our school system is, like the people of the North-West, new to the soil, we cannot expect, in its incipient state, the perfection to be found in old provinces. In my inspection of the different schools I have considered the peculiar disadvantages, and in some cases discouragements, that only time and growth can overcome. While, as a public servant, I have endeavored to do my duty, I have not felt like being too severe in my criticisms, but rather like trying to encourage and build up. In some of the districts where it is difficult to secure an average attendance trustees have felt obliged to take inexperienced teachers—consequently not as efficient as could be desired.

In view of the rapid strides that have been made in our common schools in so short a time, would it not be wise for the Board of Education to impress upon the Dominion Government the necessity of granting a fund for the purpose of establishing one or more high schools, with training schools attached, to meet the present and increasing wants of the country?

REMARKS *re* HIGH SCHOOLS, ETC.

1. There are many teachers now holding provisional certificates who intend to follow the profession of teaching, and would like to attend a training and high school to fit themselves for the position, provided they could do so without incurring the additional expense of leaving the province.

2. There are a number of parents in different parts of my inspectorate at the present time sending their children out of this province to be educated who would gladly send them to a high school in the Territories, thereby effecting a saving and keeping their children nearer home.

3. Our more advanced schools will be able within a year to send up from two to six pupils to pass the entrance examination to a high school, and if we have no such institution parents will be obliged to send them elsewhere.

4. By having a high school teachers have an object to work up to as well as pupils; therefore a stimulating influence is constantly going on in every school.

I trust I am not overstepping the bounds of my duty when I suggest to the members of the North-West Council and the Board of Education the advisability of sending to Ottawa a general report of all the public schools now established, the number of school buildings erected in so short a time, something unparalleled in the history of public schools with the same population, thus showing a most gratifying result of the wisdom of the grant already given for educational purposes in the North-West Territories.

As there is no factor in the national greatness of a country of more importance than its public schools, no more powerful lever to turn the tide of emigration, no more potent agent to attract the European settler to make a home here, any expenditure that tends to enlarge and solidify our school system must be most effectual in bringing settlers from the old world to this vast undeveloped land. Hence I would suggest to the Dominion Government the necessity of a larger grant to carry forward the work already begun and to meet the growing wants of the country, thereby benefiting not only those now here, but opening the door for thousands who are now wavering because they feel they cannot bring children to a land where educational advantages are restricted.

I am pleased to say the trustees and electors of the districts within my inspectorate highly approve of the general outlines of the School Ordinance, and appreciate the judicious distribution of the school funds.

THOMAS GROVER,
Inspector.

CALGARY AND MACLEOD DISTRICTS PROTESTANT SCHOOLS.

It is impossible to say much concerning our educational interests in this inspectorate, as the work is now in its infancy. In a new country, with a scattered population, many difficulties are experienced during the few months subsequent to the organization of schools. Pupils varied in size and age, taught under different systems, and of various nationalities are brought together, and the heterogeneous elements thus introduced, make the work difficult for the teachers. Some lack method and others know nothing of order, these therefore need special care from the teachers that they may not be hindrances, retarding the progress of the entire school.

The teachers possess intelligence and enthusiasm in their work. The people are unanimous in striving to excel in the matter of education.

There are three schools and four teachers in this inspectorate. The schools are held in rented buildings, and some difficulty has been experienced in securing halls or houses suitable for the purpose. The preliminary steps are being taken for erecting school buildings.

The trustees of the schools have delayed completing the school apparatus, awaiting the supplies granted by the Board of Education. When these are received, all will be equipped for securing efficient management.

Generally the progress of the pupils in their studies has been rapid and the attendance satisfactory.

Experience, intelligent observation and enthusiasm will, in a short time, develop our work, and then shall we hope for excellent results.

JOHN McLEAN, B.A.,
Inspector.

CATHOLIC SCHOOLS IN PRINCE ALBERT DISTRICT.

According to the instructions received from the Board of Education at Regina, I have visited all the Catholic schools of the district of Lorne, and I have the honor to present you with the results of my inspection. I was directed to inspect four schools, viz., the schools of Notre Dame de Lourdes, Batoche, Stobart, and St. Laurent, but besides these schools directly under my inspection I have inspected a school lately established at Gabriel's crossing known under the name of Taché, and the Elementary school at Prince Albert, under the direction of the Ladies' Faithful Companions of Jesus.

I have great pleasure to report that all the schools which I visited I found in an efficient state, and are doing as well as the many difficulties with which they have to meet, allow them to do. The liberal policy of the Government in helping schools is duly appreciated everywhere, among Catholics as well as Protestants, and great credit is due to your Honor for the noble way you have worked so hard to establish so fine a system of education in the vast territory, which enjoys privileges that many countries may envy us. Here Catholics and Protestants are on the same footing, and the State grants the same liberty to all denominations without interfering with religion or doctrines. It is a boon for which we Catholics are thankful. That feeling, I am happy to say, I have seen everywhere in visiting the several schools of the district. I thought it advisable to preface my report by these preliminary words before giving the result of my inspection in every particular school of the district.

(Here follows a report on each school.)

I finish my report with the following remarks :—

1. The conditions of most of the French half-breeds in the district is so low that they cannot afford to give support to the schools established amongst them, so the schoolmasters are obliged to provide everything, houses, books, ink, paper for the school, and a good many children are unable to attend school because they are without the necessary raiment. A great number, I fear, will not come to school when winter sets in, on account of the poverty of their parents.

2. I will take the liberty to suggest to the Board of Education the recommendation to have the inspectors to visit three times a year the schools of their districts. Those inspections made regularly cannot but be beneficial to the schools and help to develop education. The teachers require encouragement in their difficult task, and watching too. The knowledge of the appearance of the inspector at regular times will be an incentive for the teachers to work hard, in order that their school may receive credit for what they have done.

REV. FATHER ANDRÉ,
Inspector.

CATHOLIC SCHOOLS IN EDMONTON DISTRICT.

I have the honor of sending you the reports of my examinations held at different times.

I expected to make other examinations, from the first day of August to the thirtieth day of September, according to the school Regulations, but the measles invaded the country just at the time our schools were to be re-opened, and the plague is still raging in our midst.

I enclose herein the reports of examinations of my schools of St. Albert, St. Léon, Cunningham and Saskatchewan. I could not examine Bellerose School on account of the sickness of the children. The school district of St. François Xavier has been out of operation a long time, nearly a year.

I wish that the Board of Education may be satisfied with this hasty report; but I confess that I am far from being satisfied that I understand every clause of the School Ordinance.

With the permission of the Board, I will make some suggestions for the consideration of its worthy members.

The time of examining schools is very unfavorable, from the 1st August to the 30th September. It is not after six or seven weeks of holidays that the pupils are prepared for an examination.

It would seem to me that first and second-class certificates require too high qualifications in candidates for primary schools.

There are small centres of half-breeds where it is impossible to erect school districts. Those people are too poor in every respect to build school houses and to pay the salary of a teacher. What could the Board do to meet the case?

REV. FATHER LESTANC,
Inspector.

LACOMBE CATHOLIC SEPARATE SCHOOL AT CALGARY.

This institution has now entered upon the second year of its existence, and has advanced in every way with the growth of the town of Calgary, which is saying much in its favor. If the past be a guide as to its future progress, the convent has a great work before it, and those accomplished educators, the Sisters, have a field for their usefulness. A glance at the amount of instruction imparted during the last year in history, geography, grammar, writing, reading, arithmetic, drawing,

vocal and instrumental music will show that a very intelligent course of teaching is pursued by the Sisters in charge. The method of imparting instruction in the various branches is one calculated to strengthen the pupils' powers of observation, refine the taste, and excite enthusiasm for serious study.

J. W. COSTELLO,
Inspector.

ST. VITAL OF BATTLEFORD CATHOLIC PUBLIC SCHOOL.

The school re-opened on the 12th September, about two weeks later than usual. This delay was found necessary on account of the prevalence of sickness.

The pupils are mostly French Canadians and French half-breeds, yet there are from twelve to fifteen English Protestants, and the tuition, though mostly French, is also largely composed of English, enough to allow me to say that both languages are taught and spoken, and on a pretty equal footing.

The average daily attendance has been 34, which will likely increase when the prevalent sickness of the past weeks has completely disappeared, and will remain so until cold weather sets in, when a falling off to 30 or 35 may be expected.

As the school has only just re-opened and I could not delay my report any later, I cannot as fully report as I otherwise would, but it is my intention to closely watch the progress, the efficiency and the methods used in the school, and do my best to promote its interest and efficiency.

EDOUARD RICHARD,
Inspector.

REPORT
OF THE
COMMISSIONER
OF THE
NORTH-WEST MOUNTED POLICE FORCE
1886.

Printed by Order of Parliament.



OTTAWA
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1887.

*To His Excellency the Most Honourable the Marquess of Lansdowne, Governor
General of Canada, &c., &c.*

MAY IT PLEASE YOUR EXCELLENCY,

The undersigned has the honour to lay before Your Excellency the Annual
Report of the Commissioner of the North-West Mounted Police Force.

Respectfully submitted,

JOHN A. MACDONALD,
Superintendent-General of Indian Affairs.

TABLE OF CONTENTS

	PAGE.
Commissioner's Report.....	1

APPENDICES TO THE ABOVE.

A. Report of Inspecting Superintendent Herchmer.....	19
B. do Superintendent Cotton.....	22
C. do do McIlree.....	27
D. do do Gagnon.....	33
E. do do Neale.....	35
F. do do Steele.....	43
G. do do Perry.....	50
H. do do Griesbach.....	60
J. do do Jarvis.....	61
K. do do Antrobus.....	65
L. do Inspector Howe.....	73
M. Distribution state of men and horses.....	77
N. Report of Senior Surgeon Jukes.....	79
O. Report of Assistant Surgeon Kennedy, Fort Macleod, and Sick Report.....	90
P. Report of Assistant Surgeon Miller, Battleford.....	93
R. do do Baldwin do.....	94
S. do do Rolph, Regina, and Sick Report.....	96
T. do do Aylen, Saskatchewan do.....	99
U. do Acting do Henderson, Calgary do.....	102
V. do do do Bain, Prince Albert do.....	105
W. do do do Mewburn, Lethbridge do.....	107
X. Report of Hospital Steward Holme, Maple Creek, and Sick Report..	109
Y. do do Hazelton, Wood Mountain.....	112
AA. Return of Criminal and other cases tried during the year.....	115
BB. Return of cases disposed of by Inspector Piercy in British Columbia.....	146
CC. Map, in separate cover, showing Patrols of North West Mounted Police during the year.	

ANNUAL REPORT OF COMMISSIONER L. W. HERCHMER, NORTH-WEST
MOUNTED POLICE, 1886.

OFFICE OF THE COMMISSIONER,
NORTH-WEST MOUNTED POLICE,
REGINA, December, 1886.

The Right Honorable
Sir JOHN A. MACDONALD, G.C.B.,
President Privy Council,
Ottawa.

SIR,—I have the honor to submit this my annual report as Commissioner of the North-West Mounted Police, to which office I was appointed on the 1st April last, together with the annual reports of the Inspecting Superintendent and the Superintendents Commanding Divisions for the past year. I also enclose reports from Senior Surgeon Jukes and the Assistant Surgeons as to the Medical department of the force.

PROTECTION OF FRONTIER AND PATROLS.

As soon as possible after taking command, I took steps to secure the safety of the frontier by establishing a complete line of outposts, connected by patrols, between the Manitoba boundary and the Rocky Mountains, and I am happy to say that the result has quite answered my expectations, as horse stealing and smuggling have been to a great extent stopped. Still, it has only been by constant exertion and watchfulness that so much has been done. On the unavoidable withdrawal of a party in September between the head of the Cypress Mountains and Lethbridge, a marauding party of South Piegans immediately found out our absence and attempted to take advantage of it. Constant patrols have been carried on by all the divisions under my command, resulting in not only a suppression of crime in their immediate districts, but on several occasions by the arrest and punishment of parties who had managed to evade our frontier patrols and had succeeded in reaching the interior of the country. The attached map will give you some idea of the enormous tract of country that has been frequently patrolled.

HORSES.

I found the Force particularly weak in horses, being not only very much too few, but also in many cases of an inferior description, arising partly from the great quantity of work done during 1885, but generally from the large number of unsuitable horses that had to be bought in a hurry during the rebellion, and afterwards on the sudden large increase of the Force from 500 to 1,000 men. Having reported that it was useless to keep such horses on the strength of the Force and having received your sanction, I immediately commenced to weed out all the horses that I considered it impossible, by rest and ease, to make efficient, and from time to time when good opportunities for sale have occurred these horses have been offered to public competition with generally most satisfactory results, many of our cast horses selling within 25 per cent. of the price at which good ones have been bought to replace them.

Early in the season 125 horses were sent up from Ontario for team horses, in

which the Force was very short, advertisements having been called for these horses before I left Ottawa I had intended to have purchased them myself, but owing to my presence being required at headquarters the duty devolved on the Assistant Commissioner, and a good many horses unsuited for Police transport were purchased. The majority of the horses objected to were too heavy for our work and too flat in the feet, but were otherwise strong and able horses. As many of these as possible I have sold at remunerative figures, and replaced with more suitable horses, but the exigencies of the service necessitated some of those retained being employed on fast trips, before being seasoned, through sections of country affording only alkaline water, and we have lost a few from this cause. As the rest of these horses have stood a particularly hard summer's work with great scarcity of water and are now in fair condition, we have reason to believe that they are acclimatized and will do the transport service well. The first season being always hard on Ontario horses imported to this country, a large percentage in civil business with the best care invariably dying the first year. After this no more Ontario horses will be required for any purpose.

The horses offered here now, both raised in the North-West and imported from British Columbia and Oregon, of which we have purchased nearly 200 this year, are giving every satisfaction. While on first purchase it is very difficult to get transport horses, I have found after a short time on our feed quite a number of them grow and fill out so rapidly that in future this class will supply nearly all our wants for transport, and while a serviceable team of Ontario horses cost at least \$400 delivered, these western horses only cost \$250 a team, and are not nearly so liable to disease and death from bad water and exposure. At present with the exception of "G" Division the Force is very well horsed indeed; this Division is not as well off as I should like, but with care and good management will be able to do all the work required until spring, when I would recommend that a number of these horses be cast and replaced with good ones. In other divisions the severity of winter work will certainly find out the weak spots in some of the horses, and I feel certain that it will be found necessary to buy one hundred remounts in the spring to enable us to carry out next season's work, and while the present efficient system of patrols is carried out it must be expected that there will be an apparently, to eastern people, very large number of remounts required. This is caused by our being unable to buy horses old enough for the work and consequently being obliged to use our young horses at first. No comparison can be made between the work done by our horses and by those of any force that I am acquainted with. Not only have our horses frequently to travel in pursuit of horse thieves and other criminals, over fifty miles a day for some days, but when merely patrolling in the southern country adjacent to the boundary, the want of water frequently compels parties to exceed this distance for several days, and "D" Division in September on the march from Battleford to MacLeod had, on one occasion, to make fifty-eight miles with loaded teams. To this must be added the extremely cold winters, and the absolute necessity when duty calls of taking horses from stables to camp on the bleak prairie for days at a time.

All this must tend to use up a large number of horses, which people unaccustomed to our country and our work naturally consider excessive. A number of horses slightly stale have been turned out for the winter, and will be taken up early in the spring, generally much refreshed by this treatment, and will then stand another season's hard work, this will also save a lot of forage.

FORAGE.

I had hoped this year to greatly reduce the amount required to purchase forage, but the late extremely dry season, and the consequent enormous rise in the price of oats all over, and at most posts of hay, has necessitated the expenditure of a great deal more money than I expected, but every care has been taken by careful

stacking and economy in feeding to reduce this expenditure to the lowest point that the efficiency of the service will permit.

TRANSPORT.

As much as possible it has been endeavored to do away with all outside transport, and I am happy to report that the efforts in this direction have been generally successful. The march of "C" Division from Macleod to Battleford a distance of over 350 miles through an uninhabited country and of "D" Division from the latter place to Macleod having been effected at a total cost of \$250 for outside freighters, and this amount could have been saved if I had had as much experience of the Police as I now have, but to place us on a thoroughly independent and efficient footing considerable changes must at once be made in transport.

It has been the custom from time to time to purchase transport as required, and many of the vehicles thus purchased are found on trial unequal to our wants. With your permission I have ordered some pattern waggons to be made, to be oiled not painted, and from this standard it is proposed to buy all future waggons and buckboards.

HARNESS.

The harness supplied during the past year with the exception of a few sets necessarily bought in the country from local dealers, has been of very good quality and workmanship indeed, but unnecessarily heavy for our present requirements. I have already sent you specifications of harness of a lighter pattern which an experience of fourteen years has taught me is the most suitable for the country. I have also suggested certain alterations in the halters and small articles of leather sent to us in a manufactured state. Many of our horses are, when bought, wild off the plains, and halters for eastern horses are of no possible use for bronchos.

It is to be hoped that in future you will sanction our making all these and many other small articles, such as head-collars, holsters, hoppers, &c., ourselves, we having in the Force in the person of Saddler Major Horner a mechanic second to no tradesman in the Dominion, and we only require a few good stitchers and the leather to do the work.

SADDLERY.

The saddles made by Messrs. Main & Winchester are generally of good material, but should be at least two inches longer in the tree to enable us to carry rolled great coats behind the saddle, and should all be supplied in future with double cinches, as in hilly sections of country the single cinch saddles have to be drawn too tight and galls are certain to occur, otherwise these saddles, standing all sorts of weather admirably, are well adapted for our use, and preferable, all things considered, to any I know of; but for training recruits twenty saddles such as are issued to the Mounted Infantry Schools should be supplied for the Riding School. All imitations of the California saddle as yet made in Canada are unsuitable, and if used on service for a week would not only use up all the men but give sore backs to every horse in the command.

NUMNAHS.

A numnah as now supplied will not last four months if constantly used, and I have recommended lately to you that a pattern of the shape suitable for our service be sent to Pimlico, and that we get permission to obtain an adequate supply from the Imperial Government, made out of the material issued to the Imperial Cavalry until a suitable article is made in this Dominion.

WHITMAN BITS.

The Whitman bits, generally in use throughout the Force, are well suited to our requirements, when horses are once thoroughly broken, but are useless to break horses with, and I have suggested that a few cavalry bits and bridoons be furnished for breaking purposes, while a certain proportion of Whitman bits, with spare springs, should be supplied of a wider make, than those now in use for horses requiring them.

ARMS.

All the force have now been supplied with Enfield revolvers, which arm is eminently adapted for our use, and all have Winchester carbines. This weapon appears to be well suited to our requirements, but needs a good many improvements, deficiencies existing in the sighting of many of these carbines, and they are too weak in the stock. In future purchases these defects should be carefully attended to.

We are now well supplied with seven and nine-pounder guns, but we require ammunition waggons. Several gun detachments, during the season, have been well trained, but I do not consider these guns as well suited to the country or the encounters we are likely to be engaged in, as machine guns, and I would suggest that each division should be provided with a Nordenfeldt gun, which is easily handled in any part of our country, and I believe would be much more efficacious in action.

AMMUNITION.

Complaints have been made that some of the ammunition is weak, but all that has come under my immediate observation at headquarters has been good enough, the failure to reach the targets generally being occasioned by defective sights and inexperienced marksmen. An extra amount of ammunition should be allowed for target practice, and the repayment price should be put at as low a figure as possible, to encourage men on the prairie to practice whenever they can.

TARGET PRACTICE.

Target practice has been carried on in all the divisions, but while many of the men have made excellent shooting, a considerable number have done poorly. This I hope to remedy next season by careful overhauling of the carbines, and by more instruction in preliminary drill.

PRESENT SYSTEM OF CARRYING CARBINE.

The present system of carrying the carbine on the horn of the saddle, while perfectly suitable for patrolling, is not adapted for close ranks, several plans are now on trial; and it is proposed, with your permission, to adopt the most convenient next season for the whole Force.

INCREASE OF FORCE AND RECRUITS ENGAGED.

During the last year it was deemed expedient to increase the Force, in a very limited period, from 500 to 1,000 men, and consequently many men were admitted who were neither suited by character or ability to perform the onerous and responsible duties of their new positions. It has since been found necessary to invalid some of these men who were passed by medical examiners in eastern Canada; and a good many others were men accustomed to lead idle lives around towns, this class finding that the discipline enforced prevented them from following their natural inclinations, have, in many cases, deserted; and, owing to the great facil-

ties furnished by the enormous extent of country, have, in many instances, effected their escape, but many have been recaptured; and the majority, after undergoing their imprisonment, have turned out very well indeed.

The men we want are farmers' sons, with good common school educations, and a proportion of the better class of discharged short service men from the Imperial service. Of these two classes our best men are generally composed, although we have a number of young men of good family and education, many of whom, after a short service, in which they get accustomed to the work, are all that can be desired; but it is to the farmers' sons, raised in the Dominion, that I should like to look for the majority of our recruits; this class of recruits all understand the care of horses, and are accustomed to hard outdoor work, to the climate and to taking care of themselves in any situation; but, unfortunately, the short term of five years does not permit us to keep these trained men a sufficient time in the service; the best and smartest generally, after one period, decline to re-engage, as there is nothing to look forward to; at the expiration of five years they are generally young men feeling able to turn their hands to anything; but if a second period is put in very few would care to adapt themselves to civilian life; the majority know this, and seize the many good chances offering of taking permanent situations after their first period of service. This only can be remedied by a system of pensions, which, if carefully administered, would retain in the force a large percentage of our best men, whose example would be everything to our recruits.

Such a system I had the honor lately to submit to your consideration and the trifling expense incurred would be many times over repaid in the efficiency of the Force, which only requires the prospects of such a reward for long and meritorious service to secure and retain the services of the best men in the Dominion.

ENFORCEMENT OF LIQUOR LAW.

The enforcement of the liquor laws is the most disagreeable and trying service the North-West Mounted Police are employed upon, and in this particular service more than in any other our weakness is apparent. Our men are generally young, and it is not possible to expect very young men to enforce these laws, unless they have a large proportion of older and steadier men to set them an example, and all with a future in the service before them. To secure an efficient Police it is necessary that the men must believe that they are better off than they could be out of the Force, and the greatest punishment inflicted should be dismissal, no constable should be kept in this Force who requires imprisonment for any offence.

COMPENSATION FOR KITS AND INCREASED RATE OF EXTRA PAY TO ARTIZANS.

Another cause of complaint has just been removed, viz., the want of a system of compensation for kits. Prudent, careful men now have a chance of saving a little money by receiving two-thirds of the value of those articles they do not require; and if the increased rates of pay are granted that I have recommended to certain artisans, great encouragement will be given, while at the same time great saving will accrue to the Department, enormous prices being charged in this country for the simplest repairs, but the extra pay hitherto granted to mechanics when employed at their trades has not been a sufficient inducement to secure good tradesmen.

CONDUCT AND COMFORT OF MEN—BANDS AND RECREATION ROOMS.

The conduct of all Divisions since I took command has been generally very good indeed, and the erection of new barracks already commenced at Lethbridge, Regina and Battleford will greatly tend to the men's comfort and enable them to enjoy a little amusement when off duty, the want of suitable recreation rooms having

been the cause of most of the instances of misconduct among the men, they having had to seek any little amusement they enjoyed in the company of the usual inhabitants of frontier towns in billiard saloons. The entire absence of theatres, concerts and other sources of amusement being extremely hard on young men, generally of good education, but with the advent of good recreation rooms and the establishment of bands in many of the Divisions most of these drawbacks will be forgotten.

Both "H" and "E" Divisions have already good bands entirely without Government assistance, and a band (instruments provided by the Department) has just been started at headquarters. Other bands will shortly follow, and I would recommend that a yearly grant of \$50 be made to each Division for the purchase of music.

BARRACKS IN CHARGE OF PUBLIC WORKS DEPARTMENT.

The handing over the erection and repairs of barracks to the Department of Public Works will, I think, work admirably, but a competent Clerk of Works should be appointed to attend to Police business only, as there is plenty of work for one man, and constant practice at our work would soon render the services of an experienced man much more valuable to our department.

ERECTION OF NEW BARRACKS.

As it is proposed to erect new barracks at Prince Albert, where I have lately recommended the selection of a suitable site at a reasonable figure, and at Calgary and Edmonton (where I have not yet found a site), and at Battleford, I would strongly urge the adoption of brick, as being cheaper in the end and better adapted to resist fire, and in future all barracks should be two-storeyed, being more easily heated and less expensive in construction.

A new post is also required at Wood Mountain, which must always be an important point, and many small outposts are also needed; but, owing to the present unsettled routes of various railways about to be constructed, it is not advisable to spend money until we are satisfied where barracks will be permanently required, and for the present, rented buildings and boarding houses must meet our requirements in winter, and tents in summer.

PICKET FENCE ROUND BARRACKS.

Strong picket fences are also required at all posts, as the annoyance caused by cattle is great, and without proper fences it is impossible to keep both Indians and cattle outside the post.

BARRACK FURNITURE.

Now that the location of permanent barracks has been finally settled at all important points, I would suggest that more attention be paid to supplying suitable barrack furniture, more particularly iron bedsteads, the same as are in use in the Imperial service. These, instead of the present makeshift trestle and board style, would materially add to the comfort of the men and greatly improve the appearance and cleanliness of the rooms.

PHYSIQUE OF FORCE.

The physique of the force is very fine and improving all the time, the trouble being to get clothing large enough; but now that our clothing is generally made in Canada, with proper size rolls there should be no difficulty in guarding against this mistake.

CLOTHING.

To keep this Force dressed as it should be, a year's supply of clothing should always be on hand at Regina, under the present system since I have taken command we have always been short.

ESTABLISHMENT OF TAILOR'S DEPARTMENT AT HEADQUARTERS.

The establishment of a proper tailor's shop at headquarters with a competent Master Tailor will greatly improve the fit of the clothing and with that the appearance of the men.

BUFFALO OVERCOATS.

The impossibility of furnishing the men who have joined this year with buffalo overcoats has afforded me the greatest uneasiness, as the Force in winter is quite useless without some such protection, and as yet no efficient substitute has been found. For this winter we are, however, well supplied by the arrival of seventy-five guard coats, with which we can manage this season.

RIDING SCHOOL AT HEADQUARTERS.

The construction of a most commodious Riding School at Regina is found of the greatest service; hitherto drill has been almost at a stand still during winter at Headquarters, but now all the recruits can be thoroughly trained in the winter, and be ready for prairie service when required in the spring, and the Department having lately appointed to an Inspectorship, Captain Matthews formerly Riding Master and Adjutant of the 3rd Imperial Hussars, has placed me in a position to avail myself to the fullest of these advantages. All constables on joining are thoroughly instructed in drill by Inspector Matthews and in Police duties by Superintendent Gagnon, an experienced lawyer.

STANDING ORDERS AND DRILL BOOK.

Revised Standing Orders for the Force are now ready for the printer, and a short and concise drill book is being prepared to which instructions in Police duties and simple rules of Veterinary practice will be attached, which will place in each Constable's possession a complete explanation of all his various duties.

CAMPS OF INSTRUCTION.

A camp of instruction was established at Calgary during the summer, part of "G" Division joined "E" and both were inspected by you in August. It is proposed next year with your consent to form several camps at suitable places, as the result of the last was most satisfactory.

ESTABLISHMENT OF A DETECTIVE FORCE.

The establishment of a small force of reliable detectives, already authorized, is urgently required, particularly if the North-West liquor laws are to be still enforced. I am sorry to say that in the enforcement of this law the Police receive very little real encouragement from the class of settlers who are loudest in their complaints of its evasion, if the settlers opposed to liquor do not care to take the responsibility and odium of laying information it is useless for them to complain that the Police are not sufficiently zealous in this direction.

RATIONS SUPPLIED, BAKE OVENS, EXTRA PAY FOR BAKERS.

The rations supplied to the Force during the last season have been, on the whole, excellent, but in many places where meat should be cheapest the contract

price, owing to want of competition and arrangements between traders, has been much too high. For instance, beef at Regina, where it has all to be brought from a distance, is only seven cents per pound, while at Macleod it is ten and at Edmonton, Battleford and Prince Albert it is twelve and one-half cents per pound. In future only Hungarian patent flour should be called for, as Strong Baker's seems a variable grade and the delay in proving this, and making the contractor get better, is a constant trouble. During the summer we have tried buying bread, giving local bakers our flour to bake up, but I am of opinion that with Hungarian flour and a little better working pay to bakers the baking ourselves is a cheaper and better system in every way, and ovens should be erected at every post not already supplied, as the more work we can do within ourselves the more efficient we will be in times of trouble.

PAYMENT OF ACCOUNTS AND RE-ESTABLISHMENT OF SUPPLY STORE AT HEADQUARTERS.

The system lately adapted of paying accounts from Regina works very well indeed, and I think the re-establishment of a supply store at headquarters, for the whole Force, will work admirably, when the old buildings, lately used by the men as quarters, are fitted up for the purpose. Still it will be found necessary to purchase many little things at the headquarters of the various Divisions, and where they can be obtained at fair prices, I consider in a new and struggling country, with proper supervision from the officers, this practice should be encouraged.

PURCHASE OF SUPPLIES.

As far as possible it has been my aim to purchase all forage and other supplies entrusted to me to purchase from the settlers at each post, but the failure of the crop throughout the North-West last summer has necessitated most of the oats coming from Manitoba, and in some places the settlers have yet to learn that the Police intend to get their supplies, at any rate, at as low a price as ordinary individuals can buy them.

MEDICAL DEPARTMENT.

Irregularities have occurred hitherto in keeping the medical histories of men, and I have issued very stringent instructions on this point, but the unavoidable employment of civilian surgeons at many posts, over whom I have little or no control, is a great drawback to obtaining efficient returns, and I consider more surgeons are required in the Force; it is impossible, without ample assistance, for the Senior Surgeon to keep his department in a thoroughly efficient and business-like manner.

VETERINARY SURGEONS.

Another Veterinary Surgeon is urgently required, there being only one at present, Mr. Riddell, to look after ten Veterinary Sergeants scattered all over the country, and now that our establishment calls for 900 horses, at least two competent men are required, unless all the Veterinary Sergeants were qualified Veterinary Surgeons, which, with our present rate of pay, can hardly be expected.

The pay allowed, \$700 per annum, under the Act, for a Veterinary Surgeon, is not sufficient for the services of a competent man, and at that salary I fear we cannot expect to long retain the services of an efficient professional man. The Inspectors of this Force, on appointment, receive \$1,000, and it can hardly be expected that professional services can be obtained for less. I would respectfully suggest that the salary of the Veterinary Surgeon be increased to not exceeding \$1,200, and that one assistant, at least, be allowed at not exceeding \$1,000. I assure you the increased expense would be more than saved.

WELLS.

Additional wells have lately been sunk at all our posts, and an ample supply of water has generally been obtained, and the arrangements made for the supply of manual fire engines and hose will, with our usual bucket system and Babcocks, which is fully kept up, render us tolerably safe from fire; but in the northern posts, owing to the continued and prolonged cold weather, a small chemical engine should be supplied.

TANKS AND WINDMILLS.

A good tank and windmill should be erected at all posts next season, the wind blowing nearly every day in this country being sufficient to keep the tank constantly full, and with proper construction and a stove beneath there would be little fear of the tanks freezing in the coldest weather.

TENTS.

The bell tents supplied to the force are too small and very inconvenient for permanent camps, it being impossible to use bedsteads, and the men have to lie constantly on the ground.

For outpost service I would suggest that a certain number of oblong tents, made of heavy duck, with three feet walls, be supplied, in these men can, when camped at one place for a length of time, erect temporary bedsteads, and thus save themselves from a great deal of rheumatism, from which a good many of our best men suffer.

Each division should also be supplied with six A tents, 8 feet square, made of strong duck, for small patrols, and three tents 18 feet square, with 6 feet walls and a centre pole only, and with guy stakes at each corner, should also be supplied to each Division; these tents, when floored and lined with matched lumber and supplied with a stove could, on emergency, make good winter quarters for outposts, and make capital store tents.

PICKET LINES.

The picket lines we are able to obtain in Canada are of very poor quality, kinking all up when wet, and wearing out very fast. A better class of rope is supplied to the United States Cavalry, and a quantity of this material is required for our service. It is difficult to get constables to carry rope that is constantly kinking and giving great trouble, and the loss of several horses during the last summer may thus, I think, be attributed indirectly to the unsuitable rope we are able to buy.

TELEGRAPH SYSTEM.

The telegraph lines have been of great assistance during the year, but a line from Edmonton to Calgary is badly needed, and the line should be continued to the boundary south of Fort Macleod. At all important stations the lines should be run into the Barracks, as under the present system we cannot use them during the night and during portions of Sundays. Wood Mountain and Maple Creek should also be connected with the telegraph lines south of the boundary.

PRINTING PRESS.

I applied lately for a small and convenient printing press, this would save an enormous amount of writing, and enable us to, at all times, have a sufficient supply of forms on hand.

DESERTIONS.

Most of the deserters during the past year were men who had not completed a year's service, many of them but a few months, and, with very few exceptions, were men of a wandering disposition, who would not be contented in any sphere of life. As a rule, desertions take place during the first year of service, and the seeming large number during the past year is due to the late hurried increase in the strength of the Force, when many men of a class were engaged who, otherwise, would not have been accepted.

With reference to the remainder, two were at the time under arrest for a breach of discipline, and rather than stand their trial, broke out of barracks and escaped. Four were men stationed in the western districts, and deserted for no other reason than that of obtaining the high wages offered to men in the mines in Montana, U.S. Two were granted leave of absence to attend to private affairs in the East, and did not return at the expiration thereof. One was acting as Quartermaster Sergeant in the northern district, and taking advantage of the absence of his Commanding Officer and Division, committed breaches of discipline, for which, had he been tried, would have resulted in severe punishment; rather than undergo this, he deserted.

GENERAL STATE OF DIVISION.

It has been my aim, since appointment, to keep the Divisions in the west in every way ready for any emergency that may arise. All those Divisions are now well horsed, armed and equipped, and each is at its full strength, and generally all ranks are well up in their work; and if unfortunately they are called upon at any time to face the Indians, I have no doubt they will be found quite equal to the occasion.

HEALTH OF THE FORCE.

The general health of the Force has been excellent during the last year, and with the exception of an outbreak of fever at Battleford, which unfortunately resulted in five deaths, there has been no serious illness, every precaution having been taken to keep the barracks and their environs scrupulously clean; to this may be attributed, in a great measure, our immunity from sickness.

ASSISTANCE TO INDIAN DEPARTMENT.

During the last year assistance has in every way been rendered to the Indian Department, and escorts have been furnished for the conveyance of treaty money through the country whenever required; and small parties have also been present at nearly all the treaty payments, and all information gathered throughout the country, of any interest to that Department, has at once been reported to the Commissioner.

ASSISTANCE TO CANADIAN PACIFIC RAILWAY.

The presence of several thousand navvies at Roger's Pass, Donald, and other places along the line of the Canadian Pacific Railway, in British Columbia, and the impossibility of preventing the influx of liquor, and consequent probability of serious disturbance, occasioned the Canadian Pacific Railway Company to apply to you for a detachment of police, which was at once sent, and remained under Inspector Piercy, until the completion of the snow slides and other work. Law and order was strictly enforced all summer, and the work was finished without any unpleasantness. This service was particularly trying to our constables. The usual amusements to be found in railway towns were plentiful; and it is to be regretted that several of our finest men got into trouble, and rather than face the consequences, deserted.

MAIL ROBBERIES.

During the summer the Royal mail was robbed on two occasions. The robber of the Prince Albert mail has been secured and sentenced, but the Calgary robbers are still at large.

The mails on the routes between Calgary and Edmonton, Swift Current and Battleford, and Qu'Appelle and Prince Albert were constantly escorted by Police after the robbery until the cold weather removed the necessity, and since then outposts have been established at points along the roads for the winter, but patrolling will be resumed as soon as it is considered advisable in the spring.

INDIANS.

The Indians throughout the country have been very quiet and apparently contented during the year, but every precaution has been taken to keep strong bodies of Police well equipped at all important points, and constant patrols in the neighborhood of reserves have been kept up. In the north there is every reason to believe that no future trouble is likely to occur, as the Police are quite equal to any emergency there.

In the south the dangerous proximity to the boundary line of the reserves, and the numerous influences at work to irritate our Indians, one of the most powerful being the necessity they are under of surrendering all stolen horses, while horses stolen from them are not recovered in the United States, always will afford cause of uneasiness, and necessitate the greatest watchfulness on our part, particularly as long as the Indians are well armed and horsed, coupled with the enormous chances they have of doing damage at a moment's notice among the numerous herds of cattle that now completely surround their reserves.

RANCHING PROSPECTS.

Great strides have been made in ranching this season, and while at first it was considered that only a small tract of country in the west was suitable for wintering cattle, large herds are now wintering as far east as Wood Mountain, and from the condition of cattle that I saw there that had wintered out in 1874 and 1875, I have every reason to believe that Wood Mountain will in future feed large herds of cattle. The cattle men on this side of the line have, however, next season to make up their minds that beef in the North-West is only worth its value in eastern markets less freight and charges. A great drop in value has occurred this year already, and next season the cattle industry will be on a business footing.

CROPS.

While a very unfavorable season has generally interfered with the prospects of the settlers, still at certain points good crops have been grown, and at Calgary and Edmonton plenty of oats have been secured for the police, and an excellent crop of wheat has been raised at Prince Albert.

As a rule too little fall ploughing is done in the North-West, and there is consequently too much hurry among farmers in the spring, and large tracts of land are sown but not sufficiently worked; nearly all the farmers work too much land for their strength, and but very few indeed make any use of the manure from their barnyards, and although at nearly all Police posts farms are quite close, I am not aware that any manure is drawn from our stables by any farmers.

GAME.

While the larger game is rapidly disappearing in the country, a considerable number of small deer and antelope are still to be seen, and furs, such as beaver, lynx and mink, are in many parts still very numerous indeed, and afford good wages in winter to those who are able to follow hunting for a living.

Since my appointment, I have received the hearty co-operation of the Officers, Non-Commissioned Officers and men generally, and all ranks have shown a laudable desire to take advantage of every opportunity afforded for increasing their knowledge of matters connected with their profession; and if the services of the North-West Mounted Police have been acceptable to the country during the time I have held the Commissionership, to the above causes must be attributed the result.

I append hereto the annual reports of:—

Inspecting Superintendent Herchmer.

Superintendent Cotton.

do	McIllree.
do	Gagnon.
do	Neale.
do	Steele.
do	Perry.
do	Griesbach.
do	Jarvis.
do	Antrobns.

Inspector Howe.

Distribution state of men and horses.

Annual reports of Senior Surgeon Jukes; the Assistant Surgeons and Junior Medical Officers of the Force.

Return of criminal and other cases disposed of in the North-West Territories from 1st December, 1885, to 30th November, 1886.

Return of cases disposed of by Inspector Piercy as Commissioner of Police and Justice of the Peace for British Columbia while on duty in that Province.

Map showing Patrols of the North-West Mounted Police during the year.

I have the honor to be, Sir,

Your obedient servant,

L. W. HERCHMER,
Commissioner.

APPENDIX A.

ANNUAL REPORT OF INSPECTING SUPERINTENDENT HERCHMER, 1886.

CALGARY, 2nd December, 1886.

SIR,—I have the honor to submit my annual report for the year ending 30th November.

POLICE DUTY.

During the year a great deal of police duty was performed as is shown by the return forwarded with Superintendent Antrobus' report.

PATROLS.

Regular patrols were sent out in different directions.

ILLICIT LIQUOR.

A large quantity of illicit liquor was seized and spilt. On one occasion Inspector Wattam seized fifty-five gallons in possession of two men named C. Lafferty and J. Young, apparently *en route* to Edmonton; at same time seizing three horses, one waggon and harness, and camp outfit. These were taken possession of by the Customs and sold, the men tried and convicted.

On another occasion Inspectors Moodie and Riddell seized 300 gallons which had been unloaded from a grain car on the Canadian Pacific Railway at Langdon. In connection with this four men were arrested, tried and convicted.

The balance of liquor seized was in quantities of ten, five and two gallons, in some instances at the railway station, it being addressed to fictitious names, and put up in various ways calculated to escape detection. There is no doubt that there has been collusion on the part of railway employés, or else this system of smuggling liquor could not be carried on. A baggageman here was tried, convicted and dismissed by the railway company for having connection with this traffic. Liquor is also brought in on passenger trains from the west, being packed in hand-bags, and carried in by passengers at Donali, and left on the seats of passenger coaches. If the police detect anything wrong or suspicious, the hand-bags are not claimed, so that there is no conviction.

In all these cases above the liquor was spilt, amounting to about 600 gallons.

DRILL.

Every opportunity, weather permitting, was taken advantage of for drilling, both dismounted and mounted, and the men were put through regular target practice. I would suggest that, as Calgary is rapidly settling up, before it is too late a piece of ground be laid aside for a rifle range.

COMMAND OF "E" DIVISION.

On the 7th April Supt. Antrobus took over command of "E" Division from me.

CAMP.

During the summer "E" Division and the headquarters of "G" Division, consisting of one officer and fifty men, were camped on the Bow River and remained there for about six weeks. This had an excellent effect, and gave a good opportunity of perfecting the men and horses in drill and camp work. I would suggest that next summer a larger camp be formed here, it being a very central place for the western divisions to meet. Two hundred men could easily be massed from "E," "G," "H" and "D" Divisions.

INSPECTIONS.

I visited Edmonton and Fort Saskatchewan three times, the first occasion in February on special duty; then in May and November, when I inspected "G" Division. I visited Fort Macleod five times; inspected the divisions thrice the other two visits being to purchase horses. I also inspected once at Lethbridge and twice at Medicine Hat, and went to Regina three times on special duty. Reports on all inspections were made.

MOUNTAINS.

A detachment of one officer, two non-coms. and fourteen constables was stationed in the mountains for special service in connection with the railway, and placed at Donald and Rogers' Pass during the time construction was being carried on, and did excellent service in preventing and checking crime. At times there were at least 5,000 laborers employed, and all within thirty miles of road, a large number being together near Rogers' Pass. There was also the consequent large number of desperate characters who follow construction. Still there were no serious crimes committed, which shows the good service performed by our men. I inspected these detachments monthly while on duty in the mountains. There were a number of desertions. I can only account for this from the monotony of the service.

REMOUNTS.

I purchased 42 horses at Fort Macleod, and 113 at Calgary. Of the latter 5 were to replace 4 Eastern team horses, remounts of this year, which were sold as being too heavy for our service.

A number of the remounts were brought in from British Columbia and are of excellent stamp, and have generally turned out well.

The horses were purchased at different times, advertisements were always published in plenty of time, so allowing opportunity to all who had horses to dispose of. From all I can gather, the ranchers are well satisfied with the present system of purchasing. In my opinion, the western horse is well adapted to our service—hardy, easily kept and trained; in some cases they grow a trifle heavy on feed for saddle purposes, but these make excellent waggon animals.

As a rule, I consider the Eastern horse as sent us unsuitable for our requirements—they are, until acclimatised, very delicate, and always require more grain than the western horse; in most instances they are broken in to harness, and consequently seldom become first-class under saddle; also, in a great number of cases, I have found the Eastern horse as having very poor feet.

The Eastern remounts sent here during the year, and those I have inspected in other Divisions are in most cases unsuited, they being too large and heavy.

SADDLERY.

I would suggest that the officers be furnished with the Hussar saddle.

The head collars do not stand much work. I would suggest that the head collar as used in the Imperial service, with Portsmouth bit and bridoon, be adopted. I think they could be furnished equally as low in price as those now in use.

NUMNAHS.

The numnahs are inferior in quality and wear out very quickly.

HARNESS.

The harness is very good.

TRANSPORT.

I prefer the Whitewater waggon for loads, and think the ambulance with Concord springs, and the light Chatham with half springs, as most suited for this country.

The buckboard furnished me this year is an excellent article, but is rather narrow in the bed, and short, to enable me to carry a proper load.

TENTS.

Each Division should be supplied with a few A tents.

OUTPOSTS.

Outposts have been established from "E" Division—

1st. At Stinson's Ranch, on the middle fork of High River, about 55 miles S.S.W. of Calgary, and commands a trail leading behind the Porcupine and the Foot Hills, by which criminals can escape Fort Macleod and its outposts, getting into the United States near Chief Mountain, and consequently easily get away.

2nd. At Scarlet's, 48 miles north, and on the Edmonton Trail.

3rd. At Banff Hot Springs.

An outpost is to be placed at once at the Blackfoot Reserve, South Camp, and one at the Anthracite Coal Mines, near Banff.

I forward a map showing these outposts, and giving the line ridden regularly by the men. (Not printed.)

I am of opinion that this regular patrolling has a most beneficial effect in preventing crime.

I consider it would be advisable next year to establish an outpost at the mouth of the Little Bow River.

BARRACKS.

New buildings are urgently required at Calgary and Edmonton or Fort Saskatchewan.

I consider Edmonton as the better situation, as being more central for the work required.

CONDUCT AND HEALTH.

The conduct and health of the men has been very good, there being little or no crime, and very little disease, and only one death. All cases tried before me, as a Justice of the Peace, are embodied in the return furnished by Supt. Antrobus.

Trusting this report may prove satisfactory,

I have the honor to be, Sir,

Your obedient servant,

W. M. HERCHMER,

Inspecting Superintendent N. W. M. P.

The Commissioner
North West Mounted Police,
Regina.

APPENDIX B.

ANNUAL REPORT OF SUPERINTENDENT COTTON.

BATTLEFORD, 1st Decembor, 1886.

SIR,—I have the honor to submit my annual report for 1886.

From January, 1886, until the end of August last, "C" Division was stationed at Fort Macleod, the Macleod District being under my command. Late in 1885 "H" Division was ordered from Regina to Macleod, thus making the force in the district two hundred men. This addition in strength was brought about from the increase of police duty demanded of us, as well as to a then objectionable change which came about in Indian affairs.

The increase of the force was, I think, accompanied by good results. Soon after you assumed command of the police, the headquarters of "H" Division was moved to Lethbridge; subsequently that Division left Macleod altogether, and from that time all the out post duty southward towards Whoop Up and eastward towards Cypress Hills was done by "H" Division. Up to the end of August "C" Division performed the usual police duty about Fort Macleod and the outposts at "Stand Off" Piegan Reserve, Pincher Creek, St. Mary's River and Riffengers Crossing.

In August last I furnished you with a detailed report on these outposts. I do not deem it necessary to now repeat this report. I shall merely add that from my experience in the south, I consider it a matter of importance that all these outposts (Riffenger's Crossing during the summer months only) should be efficiently maintained. The records of the various cases tried, and the arrests made by my Division, at Macleod will, I presume, be furnished you by the officer who succeeded me in command of that place.

During the month of August much of my time was taken up in preparing for the march from Fort Macleod to Battleford, a transfer of "C" and "D" Divisions having been ordered by you. "C" Division marched out of Fort Macleod on the 2nd of September.

Before leaving for Battleford the citizens of Fort Macleod presented the Division with a public address, bearing testimony, in the strongest and most flattering terms, of their sense of appreciation of the manner in which our Police duty had been performed. I think the Division has a right to consider such an address as an honorable record of its services in the south.

We marched out of Fort Macleod on the 2nd September, our route for Battleford being *via* the Blackfoot Crossing and the Red Deer River (Governor General's Crossing). From Macleod to the Blackfoot Crossing, a distance of eighty miles, there was a scarcity of water along the trail, owing to the exceptionably dry season. I therefore deemed it advisable to travel in easy stages. In one case we had to dig a well to obtain water. The days occupied in travelling being wet, the horses did not suffer. At the Blackfoot Crossing I forded the Bow River. The water was low. The ford I took, though unquestionably the best obtainable, is rough and long. I am pleased, however, to be able to say that we crossed without the slightest casualty of any kind whatsoever. Having crossed the Bow River I marched to Cluny, where I took in stores as well as a supply of rations and forage, in accordance with previously-made arrangements.

I then proceeded on to the Red Deer River, at which point a fresh supply of rations and forage were awaiting. The road down the very steep hills leading to the valley or "bottom," along which the Red Deer River runs, had been materially

improved by a detachment sent ahead from Fort Macleod. Of course going down these hills with heavy loads demanded of us not only much hard work, but extreme care as well. We got down, however, without the slightest accident or damage to transport. In fording the Red Deer River no trouble was experienced, the water was low and the river bottom particularly hard, yet free from stone and rocky boulders. Red Deer River was the point at which you had desired the two Divisions should meet—"C" proceeding to Battleford and "D" to Macleod. Strangely enough, considering the long marches performed, both Divisions arrived simultaneously. After taking in a supply of rations and forage I resumed my march. The pull up the hill on the north side of Red Deer River was also successfully made by doubling up teams and the free use of drag ropes.

My loads at this time (they became lighter daily, use of forage, etc.) were very heavy, and I proceeded at a rate that I considered calculated not to distress my horses. From the Red Deer River to Sounding Lake the greater part of the country presented the appearance of bad lands, and only at certain points was feed obtainable. These points were, however, numerous enough to ensure the horses getting very fair, in some cases good feed. The supply of drinkable water was good, and obtainable at easy stages. From Sounding Lake to Battleford the appearance of the country improved marvelously, there was a correspondingly great improvement in feed. The trail made by the two Divisions will last for years, and will, I think, be found most useful hereafter. The route is a much more favorable one than I had anticipated judging from the nature of the reports made to me. As I am under the impression similar reports were made to you, I would just add on this point that from Fort Macleod to Battleford I only made one dry camp, and was never without feed—the one dry camp, made at mid-day, was on the Blackfoot Crossing trail, near Fort Macleod. The health of my men throughout this march, a distance of about 334 miles, was excellent. The sick list was the smallest I have ever seen recorded. The performance of my horses was still more exceptional. From Macleod to Battleford not a single horse "played out," and the last named place was reached with the horses in as good condition as the day we marched out of the Macleod barracks. I had not a single case of "sore back," and only one collar gall, and that was from the result of an old sore.

In Inspector Brooks I had an experienced and valuable assistant. He at all times labored indefatigably, and I think that I should not close without bringing his name to your favorable notice.

On arrival at Battleford "C" went into camp in the bottom in the immediate vicinity of the Battle River Bridge. A camping place on higher ground was soon after selected and a permanent camp established on a commanding site overlooking the Battle River. The Division remained in this camp until the 22nd November, when it was moved into the new quarters built here by Public Works Department.

Your inspection of this post was made on the 20th September and following days.

The first matter meeting with your attention was the urgent need of additional barrack and stable accommodation. It was decided to erect the following buildings: One 71 ft. x 26 ft. for use as an hospital, with a small wing 20 ft. x 14 ft. Two large buildings 100 ft. x 30 ft. to be used as barrack rooms, and one building 80 ft. x 30 ft. to be used as mess room. This last building, with a wing 30 ft. x 25 ft., for kitchens. In addition to this two new stables, 80 ft. x 30 ft. were also decided on, but it was subsequently only found possible to finish one of them, owing to want of material. All work on these buildings (and other work in shape of repairs) was done by the Public Works Department. The barrack rooms are so constructed as to permit of their being hereafter available as stables, for which they are in all respects thoroughly suitable. In the meantime they will afford comfortable, airy and healthy barrack accommodation for the winter.

Attached herewith will be found a sketch (not printed) showing the exact position, on the Police Reserve, of the new buildings above alluded to. Plan of each building on a much larger scale, giving more detailed particulars, can be furnished

if required. A second sketch is also enclosed. This sketch again shows new buildings, but on a much larger scale. It shows as well other buildings required to be erected in order to complete a post of suitable dimensions to meet Police requirements at this place. In this sketch will appear such explanatory notes as I may deem expedient. The number and sizes of the various buildings required to be constructed are in all cases the result of careful investigation. In a general way I have shown these in the sketch in what I consider the manner best suited, bearing our wants in mind to the nature of the land in that portion of the reserve being built on. This, however, could of course be reconsidered hereafter, and a change made, if necessary, as regards the actual position of each building.

As you have so very recently inspected this place I do not consider it incumbent upon me to point out, at any length, how urgently new buildings are required. I shall only here add that much the greater part of the old fort is fast becoming positively uninhabitable: none of the buildings are serviceable. I am strongly inclined to believe that it will be found more economical in every respect to erect new buildings of brick. I trust no final action will be taken until the relative costs of brick and lumber as building materials have been fully enquired into. In the sketch attached the number of buildings shown is on the presumption that they will all be built of lumber, and be but one storey high (except officers' quarters). If the new fort is built of brick the number of buildings might be reduced by the addition, in many cases, of second stories. The distances between the buildings (as shown on sketch) will not, I hope, be reduced. Thus placing them is, in my opinion, the only safe method of reducing the chances of loss by fire.

In addition to the erection of the buildings above alluded to a very considerable amount of repairs have been effected, this work also being under the control of the Department of Public Works.

All the old log buildings were re-mudded and thoroughly whitewashed inside and out. This work added materially to the comfort of those quartered in them and must also have been an improvement from a sanitary point of view.

An excellent root-house has also been built, over the door of which a small log building has been erected in order to do away with vegetables being frozen during the winter months, as well as to make proper ventilation safe.

A well conveniently placed in rear of the new buildings was sunk under contract. In this well a pump was supplied from headquarters. The pump is now in the well and a well-house is being built over it. Until this house is completed the capabilities of the pump cannot (owing to frost) be spoken of with any degree of certainty. I fear, however, its powers will be found limited. If the new post is completed next year at least two more wells will be required.

The medical history of this post during the past year has been an exceedingly sad one. Never since the abandonment of Fort Walsh has malarial fever been so prevalent. The cause of the fever, together with such steps as should have been taken to prevent, as far as possible, a re-occurrence, will I presume be discussed by the Surgeons. In the meantime it is my painful duty to record the death of the following men at this post, viz.: Reg. No. 1186, Constable T. D. Sturge; Reg. No. 763, Constable J. Rummerfield; Reg. No. 1279, Constable W. H. Mason. All these men are of "K" Division.

I am pleased to be able to say that no cases of malarial fever have presented themselves in "C" Division, since its arrival from Fort Macleod. The new hospital now in use ensures the thorough comfort of patients under medical treatment. The general appearance of the hospital reflects the greatest credit upon Assistant Surgeon Baldwin, and I might here say that officer has performed his duty to my entire satisfaction.

Owing to the representations made to you by the acting Indian Agent at Onion Lake (12 miles from Fort Pitt) it was considered advisable to establish a Police outpost at that place.

Another outpost has been established at Bresaylor settlement (20 miles west of Battleford).

Both these are inspected monthly by an officer sent from Battleford for that purpose.

During the summer months a strong detachment under command of an officer was stationed at Eagle Creek on the Swift Current trail. This detachment, in addition to the patrolling duty it performed, regularly furnished an escort for the weekly mail between Battleford and Swift Current. This mail escort was maintained until the 12th of November, upon that date two small detachments were permanently stationed at intermediate points on the Swift Current trail.

The following is a distribution state of my Division :—

Stations.	Superintendent.	Inspectors.	Staff Sergeants.	Sergeants.	Corporals.	Constables.	Total.	Remarks.
Battleford	1	2	4	4	7	48	66	This distribution state does not include Asst. Surgeon Baldwin attached.
Union Lake .....	.....	.....	.....	1	.....	5	6	
Bresaylor .....	.....	.....	.....	.....	.....	3	3	
Swift Current Trail .....	.....	.....	.....	.....	.....	2	2	
On command .....	.....	.....	.....	.....	.....	2	2	
On leave .....	.....	1	.....	.....	.....	.....	1	
	1	3	4	5	7	60	80	

The following is a distribution state of the horses of my Division :—

Stations,	No.	Remarks.
Battleford	75	This return does not include 21 horses transferred on the Division leaving Fort Macleod.
Union Lake	6	
Bresaylor	4	
Swift Current Trail	2	
On command	6	Not yet struck off on G. O.
Oast and sold	3	
Dead	1	
	97	

The horses of my Division are in thoroughly good and serviceable condition. My whole Division has been thoroughly drilled, mounted and dismounted under the regulations for Mounted Infantry. I might once more say that the various articles of clothing and kit supplied for the use of non-commissioned officers and men have, almost without exception, been of excellent quality. In fact I know of no Force equally well equipped in this respect. I say this to bear testimony to the care taken to further the men's comfort. I do not, however, mean to imply that from experience gained we could not improve on the make of some of the articles in use. For my part I should much like to see the helmets and forage caps discarded. I might here say that the overshirts supplied this year—though of good material—are badly cut.

The Indian reserves about Battleford are as follows :—

Moosomin's Reserves,	12	miles	N. W.
Stoney do	15	do	S.
Sweetgrass do	18	do	W.
Thunder Child do	18	do	N. W.
Red Pheasant do	25	do	S.
Poundmaker do	30	do	N. W.
Little Pines do	35	do	N. W.

The Indians on these reserves are all apparently quiet. During the summer and autumn all these reserves were visited monthly by our mounted patrols.

I take the following from my last year's report; it still applies with equal force: "During your recent inspection I pointed out to you the serious discomfort which non-commissioned officers and men experienced from the fact of their not being supplied with bedsteads. The old boards and trestles still in use have become sadly dilapidated through wear and tear; even when new, they make a very poor substitute for a bed. In addition to this they present a sorry appearance in a barrack room."

I would strongly urge the advisability of furnishing suitable fire protection for this post. I believe a hand fire engine, with a good supply of stout leather hose, would furnish the most efficient protection with a view of preventing loss by accidental fire.

The transport of my Division consists solely of waggons (heavy lumber waggons and light spring), all in serviceable condition. I trust, however, it will be found possible to supply me with three additional light spring waggons and, at least, four good buckboards. I have already reported the winter transport required for the proper equipment of this post.

The saddlery and harness of my Division is all in thoroughly serviceable condition, though in some cases the saddles are becoming worn through fair wear and tear.

I am well equipped with saddle blankets, but require a complete new outfit of Numnahs. All Numnahs supplied should, before issue, be properly leathered at the side.

I would remind you that my Division is not well equipped with revolvers. Some of the men are without them, while others are armed with those of an unserviceable character. I trust I may at an early date receive 100 revolvers of the latest pattern.

(NOTE.—Sixty new revolvers were sent to Battleford in December, and were received shortly after this report was written.)

It will, I hope be found expedient to supply me with six additional pairs of field glasses for issue to the non-commissioned officers.

I wish to bring Inspector Brook's name to your favorable notice. I cannot close this report without bearing testimony—and I can do so with the warmest sense of pride—to the exemplary behavior of the non-commissioned officers and men of my Division. On the prairie and in quarters alike, their duties have invariably been willingly, cheerfully and efficiently performed.

I have the honor to be, Sir,

Your obedient servant,

JOHN COTTON,
Superintendent, Commanding "C" Division.

The Commissioner
North-West Mounted Police,
Regina.

APPENDIX C.

ANNUAL REPORT OF SUPERINTENDENT McILLREE.

MAPLE CREEK, 6th December, 1886.

SIR,—I have the honor to forward my annual report for the twelve months ending 30th November, 1886.

I also beg to enclose Hospital Steward Holme's report for the same period.

SCOUTING.

Small parties had been out scouting from here and Medicine Hat during the winter and early spring, whenever warm weather permitted. I had three scouts employed.

The first permanent party I sent out was on 5th April, when six men were sent from Medicine Hat to Piegan Creek, near Bull's Head. On 8th April I sent a second party of six men from here to a place in the hills near the Gap. On 12th April I reported at Regina to receive orders as to the season's work. By your orders I consulted with Superintendents Neale and Gagnon, and decided where our respective patrols should meet, which was submitted to and approved. I, by degrees, sent out detachments, stationed at the following points: Head of Mountain, McKay Creek (moved later to Graburn's Butte), Ten Mile Crossing, Cottonwood Coulee, Farewell Coulee and East End Post (moved afterwards to Frenchman's Creek). I sent a patrol once a week to the crossing of the Wood Mountain trail on White Mud River to meet Superintendent Gagnon's patrol on the East, and Superintendent Neale's patrol reported weekly at my most western outpost, Head of Mountain. Every non-commissioned officer or constable in charge of an outpost kept a diary, and sent me a copy of it weekly, these copies being collected at the Ten Mile Crossing and sent in here every Sunday. I found that the distance from the East End Post to where Superintendent Gagnon's patrol was met (about 80 miles) was too great for keeping up communication easily, and as there appeared to be a good deal of travel on the Balknap trail, I sent out another detachment of six men, who first camped at a lake near Balknap trail, and afterwards moved to the White Mud, near the Store Pile. This detachment kept a close watch on the Balknap trail, and before the amnesty was granted overhauled several parties of half-breeds and brought them into Swift Current. They also followed up the trail of a party driving a number of loose horses. It turned out to be a breed from the north, who attempted to evade Custom duties, but who was, on information furnished by members of this detachment, captured in the north. Constant patrolling has been kept up all the season, not only between outposts but in other directions. Two white men were captured on 25th April, having horses stolen from Montana in their possession. They were sentenced by Stipendiary Magistrate Macleod to five years in the penitentiary. On 6th May, trail of three Indians was found at Head of Mountain and the pursuing party came upon the Indians and chased them through thick timber, until at last Indians reached their horses and got away. The trail was followed for some distance next day, heading for Sweet Grass. No sign of Indians or horse thieves were seen until the 27th September, when some Indian cayuses were run off from Medicine Hat. On 30th September eight Indians visited a camp, about thirty-five miles from Medicine Hat, where a half-breed named Guardupuis lived. The breed could talk Blackfoot and the Indians said they were Bloods. They made Guardupuis exchange rifles, and stole from him a revolver, some ammunition and a shawl. On 1st October Scout

Quesnelle and Constable Vaudreuil came across two Indians, and in attempting to arrest them Quesnelle wounded one of their horses, which was afterwards found dead. The trail was followed next day and there proved to be eight Indians in party. They headed for the Sweet Grass. Shortly after Guardupuis being robbed, I brought in outpost from White Mud and sent Inspector Primrose with some additional men to the Head of the Mountain and increased strength of outpost at Graburn's Butte. The trail of four Indians was found near Graburn outpost on 10th October. It was followed next day but lost and again on 13th October, the trail was found and followed up Graburn's Coulée and out on prairie for some distance, when it was again lost. The trail of these four Indians was struck by some of the detachment at Head of Mountain and followed for some distance but lost eventually, owing to rain washing out tracks. The trail led as far as followed, west, along old Macleod trail. No other signs of Indians were seen, except far to the south along Milk River, where signs of Indians were numerous, who had been travelling up and down the river. Very few people, I think, passed through this district without my knowledge. Anyone not reporting at outposts was tracked up and his business ascertained. Several suspicious characters were brought in, and in the early part of the season all half-breeds were escorted in, if not personally known to some member of detachment. A number of horses have been recovered by scouting parties and owners for most of them found. A return is annexed showing number of horses found, and their disposal. The members of detachments have also acted as preventive officers, every band of horses, or cattle, or outfit of any kind being reported by them to headquarters of Division, and any small outfit that could travel rapidly escorted in. Three horses have been lost from outposts during the season, and not yet recovered. A blacksmith was stationed at Frenchman's Creek, who shod the horses of three outposts; those at Head of Mountain were shod at Sand's Mill, and the remainder were brought into this post. It is impossible to detail all the duties performed by members of the different outposts without copying verbatim all the diaries, but one or more scouting party were out from each outpost daily, and communication frequently held with outposts on each side and reports exchanged. I have much pleasure in reporting that all ranks performed their duties while on frontier service, faithfully and well, and the one case of a few Indian cayuses being stolen, is the only case of horse stealing I have to chronicle in this district. As the weather towards the middle of November began to get severe, with a good deal of snow, I began to bring in the various detachments, and by the 30th November all were in with the exception of that at Frenchman's Creek. Three of the scouts employed have been of great service. I have many first rate prairie men in my Division, but when it comes to following a trail over difficult ground good scouts are needful. Scout Cabelle, in particular, is a most conscientious and hard working fellow. I have advised several times that severe measures should be used with these parties of Indian horse thieves. They are perfectly aware that the Police have orders not to shoot them, and this knowledge makes them bold. They have no hesitation, as past instances in this country testify to, in murdering any man who crosses them in their nefarious purposes. I do not advocate shooting them on sight, but our western Indians and Indians in the south, should be made to understand that if they are off their reserves and are ordered to halt by Police and explain their presence and do not do so but pull their rifles, as they usually do, and prepare to shoot, that they must take the consequences.

GENERAL WORK.

All passenger trains were met at Medicine Hat, this point and Swift Current, and at latter place all freight trains were searched.

An escort was furnished from Swift Current to the Saskatchewan to Battleford mail.

All deserters from Assiniboine were brought in here and all Government property taken from them, amongst which were four horses. The American author-

ities sent to this place for three of them and the fourth I sent as far as the line and turned it over there. I sent two men to Balknap on 8th March to warn some witnesses required in a case before the court at Regina. Two lunatics have been in my custody and were finally sent to the Manitoba penitentiary. A town detachment has been formed at Maple Creek and a night patrol detailed at Medicine Hat whenever thought necessary by the commanding officer. A good deal of police work was done at the latter place. Eight prisoners were confined in guard room at this place and twenty-two at Medicine Hat. The men turning out at this point have saved large tracts of country from being burned. I sentenced one of the settlers here to thirty days' imprisonment for carelessly setting fire to the prairie.

Twenty-two gallons of illicit liquor was destroyed at Swift Current and five at this point. Sergt. McGinnis watched the country closely about Rush Lake and prevented any liquor being shipped down the river to Prince Albert.

CLOTHING

I would strongly advise that a waterproof of some kind be issued. The regulation cloak when wet is so cumbersome that it is difficult for a man to move about at all freely. A waterproof could be used most of the spring and summer months, and would do away with the necessity of packing the heavy cloak on the saddle wherever a man goes. I do not think a cloak will last a man's term of service if he does much prairie work. I would also strongly advise the adoption of some pattern of felt hat for field service. Helmets are too conspicuous and heavy for constant use, and forage caps are no protection whatever from the sun, and their use, I believe, tends to injure a man's eyesight.

BARRACK BUILDINGS.

The only new building erected in my district during the past year was a coal shed. The Quartermaster's store at Maple Creek was ceiled, greatly increasing warmth of building, and giving additional room upstairs. A large porch was added to the building, to hold coal oil tank, tools, implements, &c. A good cellar was dug under the store. Two new chimneys were built at Maple Creek, one in building used as officers' quarters, the other in men's mess room. All buildings at both posts were to be painted, but as yet are not finished. Buildings required at Maple Creek are: One officers' quarters, barrack room to hold twenty-five men, wash house, sergeants' quarters, stables to hold forty horses, sick stable for eight horses, saddle and harness room, a good guard room, a new hospital, or addition to present one, a recreation room and a waggon shed. The old waggon shed used for storing coal was blown down during a gale and completely wrecked. At Medicine Hat a new guard room is required, and a sick stable for six horses. A fence is much required about the barracks at Maple Creek. The cattle collect about here during cold weather, stand around the hay corral and buildings at night, and by spring the whole place is a mess of filth, and a lot of fatigue work is required in spring to clean up. If the whole reserve could be fenced in, it would be very desirable as there would then be a good area to turn out horses with tender feet, &c.

Considerable repairs will be required next season at both posts in the matter of plastering. A great deal is now cracked and liable to fall at any time. It was so bad at Medicine Hat that I had to recommend that some repairs be done. A man was hired for thirty dollars to do strictly necessary repairs.

FIRE PROTECTION.

Our appliances for extinguishing fires at both posts are very few and insufficient. At Medicine Hat, having no well, they are dependent upon a few Batcocks and hand grenades, and some buckets and barrels, always kept filled with water. At Maple Creek there are two wells, one with a force pump. There are also six Babcocks, but they are very old and require replacing.

I would strongly recommend that a small chemical engine be furnished to each post also that a supply of hand grenades be furnished, so that every man can have one at the head of his bed ready for immediate use, they not being liable to get out of order.

DRILL.

I have labored under the disadvantage of having my Division divided up during the winter, and during the summer the greater part were out on frontier duty, so that I have not been able to have much drill. Most of the men are, individually, well grounded, but from reasons already stated, I have not been able to drill my Division together. Most of the horses are taught to stand fire and lead well.

TARGET PRACTICE.

As far as able I have put the men of my Division through a course of rifle and revolver practice. Many who have been out on outpost duty have not yet had a course. Constant high winds have greatly interfered with the practice. Should the weather permit during the winter I hope to finish both rifle and revolver practice.

TRANSPORT.

I have applied for some more transport in estimates. I would recommend that one pattern of lumber waggon and of buckboard be adopted, so that in case of wear or breakage, the necessary parts may be on hand. I consider the Van Staden a good waggon. They are light running, have a brake, and not too heavy. The best buck-board I have seen in the country is one made in London, Ontario. It is light, easy-running and strong, and will carry a good load. This one has been in constant use for five years or more, and is a good buckboard now. The high buck-boards in use I do not like. They are nearly as heavy to draw as a lumber waggon, and some part of them is constantly breaking.

DESERTIONS.

I have had three desertions from my Division during the past year: Reg. No. 1208, Constable W. D. Brown was sent to Regina to be examined by a medical board. He obtained a furlough from there and did not return. Reg. No. 1320, Constable S. S. Upper, and Reg. No. 1385, Constable T. Clarey, deserted, respectively, from outpost at Frenchman's Creek. They both took horses and other Government property with them. I sent into Belknap and recovered everything.

BARRACK FURNITURE.

I would beg to recommend that suitable cots be furnished for use in barrack rooms, and also regular barrack room tables with iron legs. The rooms never look so neat as they should, when trestles and bed boards are used.

WATER SUPPLY.

The quality of the water at this post is of a very poor description. There are two wells at the barracks, and a third one north side of the creek, about half a mile distance. The water in the two wells at barracks is extremely hard, and strongly impregnated with alkali. The third well is somewhat better. I do not think it is healthy for either human beings or horses to drink. Most men going here are affected for some time by the water. It eats through any tin vessel that is used on a stove in a few days, and iron kettles and pots become lined with some hard deposit. I have reported on this subject, and urged that steps should be taken to bore for good water. At Medicine Hat the water is good, but has to be hauled some

distance from the river, and I would recommend that either wells be sunk or a tank built, and a windmill used to raise water from the river.

INDIANS.

The usual band of Indians under "Front Man" are still about here and Medicine Hat, about forty lodges in all. They are quiet and well behaved. The great drawback to them is that they are fast killing off all the game in this section. They rob the nests, kill the young ones and kill the old birds in and out of season, and in a few years at the rate it is going, there will not be a head of game in this section. Early in May last, I received orders to ship all the straggling treaty Indians who were at Swift Current to their reserves. Sergeant McGinnis not being able to move them, I left here on the 9th with six men for Swift Current, and sent a second party by road to same place, to intercept some Indians who had left Swift Current and were on their way to this place. The party turned them back and brought them to Swift Current. I had also to arrest a couple of the leaders who were trying to dissuade the Indians not to go. I collected them and shipped them by train on the 11th May, sending Sergeant Spicer and two men to see that they did not get off at any station until they reached Regina. Sergeant Spicer and party were further employed in escorting these Indians to their reserves east of Regina.

A few Indians came in from Montana in early spring and went north. None of them were those wanted for participation in the late rebellion.

TELEPHONES.

It would be a great convenience if a telephone line could be built from the barracks connecting with the town detachments. The cost would not be very great, and it would greatly facilitate the sending and receiving of telegrams as well as other business.

SADDLES, HARNESS, &C.

I am well supplied with saddles as to number, but a good many of them are of poor quality. I have quite a number of the saddles made in Canada in which the material is very poor. I consider the double cinch to be the proper one for the Force, particularly where much work has to be done in a hilly country. They are much easier on a horse, as they have not to be cinched so tight, and save many sore backs. I have applied in estimates for some more harness and parts of harness. The new curb straps are much superior to the old ones. I require a number of saddle blankets and numnahs, and would urge that the latter be made deep at the sides and edged with leather, to prevent wear by the cinch rings. The saddle rooms at both posts are miserable substitutes. Everything is crowded, and, no matter how clean everything may be, does not look decent, and harness in daily use has to be hung up in the stables.

FERRY AT MEDICINE HAT.

This ferry has always been a constant source of expense and annoyance. I would suggest that I think it would be cheaper to sell the ferry outright or lease it to some competent person, and have an established rate for crossing. If a detachment is kept in town with a certain number of horses, it will not be necessary, except in case of emergency, for horses or waggons to cross from the barrack side, and foot passengers can go either by the bridge or row boat.

HEALTH OF DIVISION.

I am glad to report that there has not been a serious case of illness in my Division during the past year. Sergeant Paterson inflicted accidentally a bad gun-

shot wound on himself, but is now convalescent. Sergeant Smart was thrown from his horse, and broke small bones in ankle. The above are the only two serious accidents to record.

HORSES.

I had on 30th November last one hundred horses on my strength. Three are missing and one died, leaving the actual strength ninety-six. I have an average lot of horses at present, but think there will be a few head to be cast next spring. I am putting out twenty head on herd for the winter.

DISCIPLINE.

I am glad to be able to report that the general conduct of members of my Division during the past twelve months has been excellent, one and all have appeared during the past season to have done their best, by closely attending to their duties, to prevent horse stealing and other crimes as far as possible in their District.

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

J. H. McILLREE,
Superintendent Commanding "A" Division.

The Commissioner
North-West Mounted Police,
Regina.

APPENDIX D.

ANNUAL REPORT OF SUPERINTENDENT GAGNON,

REGINA, 1st December, 1886.

SIR,—In compliance with instructions, I have the honor to submit the following report for the year ended 30th November, 1886:

During this year I commanded "B" Division until the 1st August last and Depot Division from that date

From the 1st December, 1885, to the 22nd April last, my Division was stationed at Regina, and supplied men and horses for the following outposts on the Railway line:—

Moose Jaw.

Fort Qu'Appelle.

Broadview.

Meyer's Farm (Pipe Stone).

Moosomin.

Also one for mail service between Moose Jaw and Medicine Hat.

The various duties connected with these numerous outposts and the routine at headquarters, escorting of prisoners in and out of the Territories, and the supplying of special parties for the suppression of crime and importation of intoxicants into the country, have kept the men of the Division very busy during the period mentioned.

I beg to recall to your memory the good services rendered by Inspector McGibbon in February last, when he was dispatched with a small party to Wood Mountain during very severe weather and secured the arrest of one Peter Olsen for bringing stolen property into Canada. Forty-five horses were recovered and returned to their lawful owner, a Gros Ventre Indian from Fort Belknap, U. S.

On the 22nd April, I left Regina with forty men and forty horses to establish patrols on the boundary line between the White Mud River, 108° longitude west, and the boundary of the Province of Manitoba—a distance by trails of about 320 miles. Inspector McGibbon with 16 men and 25 horses to proceed shortly after to Moose Mountain and take charge of the eastern part of the patrol.

Twenty-seven men and horses were stationed at Old Wood Mountain Post, my headquarters, and 12 men and 13 horses under a sergeant at Willow Bunch.

Shortly after his arrival in the Moose Mountain District, Inspector McGibbon was instructed to establish his headquarters at Alameda, with an outpost of 10 men and 16 horses at Wood End.

A weekly patrol, consisting of one non commissioned officer, four constables and a guide, was kept during the time I was in charge of the frontier between Wood Mountain Post and Crossing of the White Mud River, meeting patrols from "A" Division, Wood Mountain and Willow Bunch; Willow Bunch and Long River meeting patrols from Wood End; Wood End and Long River meeting patrols from Willow Bunch, Alameda and boundary of Manitoba; Alameda and Hill of the Murdered Scout. Daily patrols were sent from Wood Mountain; on Cart Couléa and Poplar River trail as far as the international boundaries, teams going to Moose Jaw weekly for supplies looked after that trail.

The duties performed by the Division in connection with these patrols were trying, both to men and horses, on account of the extreme heat and the scarcity of water;

the work, however, was done cheerfully and effectively, not a single case of horse or cattle stealing having occurred throughout the district during the time I was in charge.

These patrols had also the effect of preventing certain agitators from the north, who, after the rebellion, had taken refuge at Turtle Mountain and Fort Assiniboine, U.S., from carrying out their designs with the half-breeds of these localities.

There has been a great deal of migration through Wood Mountain, from Montana to Dakota, and *vice versa*, but no one was allowed to go through without having been interviewed by the patrols, and in many instances suspicious looking parties were delayed until they could give satisfactory account of themselves.

Three herds of cattle came into the Territories from Dakota, one of these, belonging to the Grey Bros., after having been kept over a month under seizure at Wood End, was allowed by the Customs authorities to return to the States, without having paid any duties. The other two herds were allowed to proceed to Cypress Hills district, where the owners had secured ranches.

Several small herds of horses were brought into the country through Wood Mountain, and duties collected on them.

On the 1st August last I was posted to the command of Depot Division and resumed charge of the Headquarter District.

On arrival at Regina I found that the men on mail service had been recalled, the outpost at Dr. Meyer's Farm transferred to Whitewood and a new outpost established at Qu'Appelle Station.

In August last I was ably seconded by Sergeant Fyffe at Indian Head, in ferretting out two burglars who were respectively sentenced to 5 and 7 years penitentiary.

On the 13th October a guard of honor, composed of two officers and 33 non-commissioned officers and constables, was detached to attend the opening of the North West Council.

The ordinary escorts were also detailed to assist the Indian Department officials in paying the different bands of Indians in the district.

The Indians are peaceful and have given little trouble during the year.

On the 6th November last one sergeant and five constables were sent on the Manitoba and North-Western Railway line to prevent the traffic of liquor in that section; this party on its return will leave two constables and horses at Wolseley, where a new outpost will be maintained during the coming winter.

Large quantities of intoxicants have been destroyed during the year and every infraction to the liquor law diligently prosecuted.

With reference to the present system of preventing intoxicants from coming into the country, I would respectfully suggest that the North-West Territories Act be amended to the effect that no part of the fine imposed be given the informant, as this system brings into the Force a great amount of discredit, the men being always charged with doing their duty with a mercenary object in view; and I would recommend that when good work, in this line, has been done by any constable his reward be supplied from the North-West Mounted Police fine fund, as in cases of extraordinary duties performed.

There has been an increase of crime during the year, due most likely to hard times, but few of the offenders in this district have escaped punishment.

The conduct of the men under my command during the year has been fairly good, and with the exception of cases of desertion few crimes have been registered.

I have the honor to be, Sir,

Your obedient servant,

SÉV. GAGNON,
Superintendent.

The Commissioner
North-West Mounted Police,
Regina.

APPENDIX E.

ANNUAL REPORT OF SUPERINTENDENT NEALE,

MACLEOD, 30th November, 1886.

SIR,—I have the honor to submit the following report of my command for the year ending this day:

On 9th December, 1885, in pursuance of orders published at headquarters, I left Regina with "H" Division, consisting of one Superintendent, two Inspectors and ninety-eight non-commissioned officers and men, with fifty-seven horses, and proceeded by rail to Lethbridge, *en route* to Macleod. Arriving at Lethbridge on the night of the 10th December, I found that the Belly River was in such a condition as to render it impossible to cross the Division. Through the kindness of E. T. Galt, Esq., the men were allowed to use the freight shed of the North-West Coal and Navigation Company's railroad as a barrack, stoves being put up for them, and there they remained until the morning of the 13th December, when I started for Macleod.

Although the river had become somewhat less dangerous, and we crossed by the safest ford, that known as the "Slaughter House Ford," we did not get over without one or two accidents and a cold bath for some of the men, the centre of the river being frozen to the bottom, causing two of the waggons to break.

Reaching the west bank we had to climb an acclivity known as "Telegraph Hill," which was covered with snow and ice, and at one place had a pitch at angle of at least forty degrees. Being very doubtful about getting up my loads had hired a "sixteen string team" (eight pairs) but finding that it took the teamster an hour and a half to take up two waggons, I selected the heaviest of my own team horses and took the remaining nine waggons up with them.

Although we left Lethbridge at 7 a. m. the rear guard did not reach the top of "Telegraph Hill," about five miles from our starting place, until 2 p. m. After a short halt the division moved forward against a very strong, cold, westerly wind, arriving at the "Old Man's" River, opposite "Kipp" about 6.30 p. m. I had gone on ahead to try the ice and finding it unsafe had a ford cut out. The saddle horses were then crossed, followed by the waggons, one of which, the hospital spring waggon, came to grief by the horses refusing to face the wind, trying to get on the ice and breaking the pole. Both men and horses were covered with ice whenever the water had touched them, as the wind was very strong and bitterly cold.

The stopping place at Kipp being only in course of erection, there was no place to go into and the raising of a tent was an impossibility. However, the horses were placed in the shelter afforded by some haystacks, and after being dried and fed the men managed to get a cup of tea and then turned in with their horses.

Next morning, the gale having somewhat abated, we made an early start and reached here at 2 p. m.

The men (85) were temporarily placed in one of the barrack rooms (built for 25) but after a few days I obtained Superintendent Cotton's sanction to remove the greater part of them to the "Old Fort" where, although owing to the dilapidated state of the buildings they were anything but comfortable, they were not crowded. From that time until the removal of part of the Division to Lethbridge the non-commissioned officers and men performed the ordinary routine duties and trips, in conjunction with "C" Division.

On the 23rd January, 1886, Inspector Howe arrived at Lethbridge and assumed command of the detachment at that place. On the 28th February I replaced the "C" Division men there by men from "H," and myself assumed command of Lethbridge, on the 24th of March, shortly after which date Inspector Howe was transferred to Battleford.

On my arrival at Lethbridge I established a lookout post at Whoop-Up which was maintained until a few weeks ago.

On the 29th of March the detachment at Lethbridge was made up to a total strength of 34 men and 28 horses.

On the 26th April Inspector Sanders left to establish the following outposts, viz:—

	Non-commissioned Officers.	Men.	Horses.
Chin Coulée.....	1	6	6
Forty Mile Coulée.....	1	6	6
Bull's Head Coulée.....	1	6	6

Inspector Sanders reached Bull's Head Coulée on the 30th April, after having travelled nearly the whole distance through a driving snowstorm, which commenced when he was only 10 miles out from Lethbridge. He then proceeded to the head of the Cypress Hills, where he arranged with the detachment of "A" Division there stationed, for a weekly communication and interchange of reports with the detachment of "H" at Bull's Head. This connection was kept up until the 15th of August, when water and feed having become very scarce it was impossible to maintain the camps.

The connection was made as follows: 2 men left Whoop-Up on Sunday at 1 p.m. for Lethbridge; 1 non-commissioned officer and 4 men left Lethbridge on Monday morning for Chin Coulée, a similar party leaving Chin Coulée Tuesday morning for Forty Mile Coulée, and another party leaving the latter place for Bull's Head Wednesday morning, Bull's Head party sending a patrol on to the Head of the Cypress, where written reports were exchanged and the parties returned to their respective camps. The horses employed on this work travelled, on an average, 273 miles every ten days, in addition to patrolling in the immediate vicinity of their own camps. The distances on this patrol are as follows:—

	Miles.
Whoop-Up to Lethbridge (in winter, 14)	7
Lethbridge to Chin Coulée	30.13
Chin Coulée to Forty Mile Coulée.....	38.82
Forty Mile to Bull's Head.....	36.35
Bull's Head to Head of Cypress.....	24.04

For ten miles east from Lethbridge the country is level, after that to Chin Coulée. the trail is through sand hills, and the travelling very heavy. The hills leading into and out of this coulée are very hard upon draught horses.

There was no water between Chin and Forty Mile Coulées, until Inspector Sanders had a well dug, which, owing to the nature of the ground, entailed a good deal of hard work, but the long stretch between these places was too much for the horses in hot weather, and the men worked hard and got fairly good water.

Between Forty Mile and Bull's Head water can be obtained from about the 1st of May until the middle of October. In Sandy Coulée, about midway from Bull's Head to the Cypress both feed and water are easily obtained.

There are no settlements or houses between Lethbridge and the Head of the Cypress on this trail, in fact the country from ten miles east of Lethbridge to Bull's Head Coulée, and south to Milk River, is a barren waste.

The water in the "Chin" and "Forty Mile" Coulées, although always alkaline, is not so bad until the middle of August, as to be dangerous to man and beast, but after that time it is very apt to cause sickness. The only good feed at either place is around the lakes, and the horses (to say nothing of the men) suffer a martyrdom during the fly season.

There being no wood between Lethbridge and Bull's Head, I had to supply "Chin Coulée" from the former place, and "Forty Mile Coulée" from "Bull's Head," which, with the hauling of provisions and forage to all the camps, gave my team horses all they could do.

I have no hesitation in saying that, although the carrying out of this patrol duty, over such a long stretch of bad country, was very hard upon both men and horses, it has tendered more towards the suppression of horse stealing by the Indians from the settlers north of the South Saskatchewan, than anything that has ever been done by the Police heretofore.

On the 22nd May, I, in accordance with your instructions, moved the headquarters of "H" to Lethbridge and shortly afterwards withdrew all the men of that Division, horses and stores from Macleod.

On the 6th of May the Division was ordered under canvas and remained in camp until the 18th of August.

On the 15th of August my horses were inspected by Cols. Ravenhill and Philips, and Veterinary-Surgeon Matthews, of the Imperial Service, who, although 30 of the number shown them had only the previous night returned from a round trip to the Cypress and back, expressed themselves as much pleased with their condition and fitness for work.

On this date, owing to my having been ordered to Macleod, to relieve Superintendent Cotton of the command in the district, he, with his Division, being ordered to Battleford, the patrol camps were withdrawn.

On the 18th I moved the headquarters of my Division back to Macleod again, occupying the Old Fort until Superintendent Cotton moved out of the new barracks.

On the 27th of August Inspector Likely arrived at Lethbridge from Regina, with 21 non-commissioned officers and men of "D" Division and assumed command of that place, where he is still stationed.

Superintendent Cotton moved out with "C" Division on the 2nd September, handing over the command to me on that day. The post was temporarily reinforced by a detachment of "E" Division, consisting of Inspector Moodie and 31 non-commissioned officers and men, and 33 horses. This detachment returned to Calgary on the arrival of "D" Division.

On the 14th September, Superintendent Steele marched in "D" Division and his men went into barrack rooms which I had prepared for them.

OUTPOSTS OF "H" DIVISION.

"H" Division is at present finding the following detachments:—

	Men.	Horses.
Stand Off.....	4	3
St. Mary's, 1 N. C. O.....	4	5
Kootenai, do	3	5
Pincher Creek, do	7	9
The Leavings.....	3	3
Kipp.....	1	2

PATROL.

A patrol of 2 constables leaves Stand Off for St. Mary's every Monday morning; leaves St. Mary's for Kootenai Tuesday; Kootenai for Pincher Creek Wednesday; and Pincher Creek for "Scot's Coulée" at 2 p.m. Wednesday afternoon, where it is met by a party from Piegan Reserve; who return to their station that evening, and report here on Thursday morning.

The distances are as follows :—

Macleod to Stand Off.....	20
Stand Off to St. Mary's... ..	28
St. Mary's to Kootenai.....	27
Kootenai to Pincher Creek.....	10
Pincher Creek to Scot's Coulée.....	16
Scot's Coulée to Piegan Detachment.....	12
Piegan Detachment to Macleod.....	9

STATIONS.

The station at Stand Off is on the north-west side of the Blood Reserve.

That at St. Mary's is south of the same reserve (48 miles from Macleod).

That at Kootenai is on the "Dry Wood" fork of that river (23 miles from Macleod).

That at Pincher Creek is on the old Police Reserve, a few hundred yards from the village (32 miles from Macleod).

That at Piegan Reserve, at the north-east corner of Reserve, on the north side of Old Man's River.

The detachment stationed at The Leavings of Willow Creek, about 35 miles north on the Calgary trail, occupy part of a stopping place. They connect with a chain of detachments from Calgary, south.

PIEGAN DETACHMENT.

It would be advisable, if a reserve can be obtained, to remove this detachment from its present location. The log house now occupied immediately adjoins (if it is not upon) the farm of a Mr. Legacy, whose house is only a few yards distant. This man can observe and report every movement of the detachment to any one he may think is interested in their movements; added to which, the house and stable are built on the edge of a belt of timber about 15 yards wide, which grows at the foot of a sloping hill, and in case of trouble the buildings could be easily approached and surrounded. Again the station is on the north side of the "Old Man's" River which all winter is in a semi-frozen state and dangerous to cross. I would, therefore, strongly recommend that this detachment be removed to some point on the south side of the river where the country is open.

OTHER DETACHMENTS.

Reserves should be set aside for the other Detachments as soon as possible. In addition to the weekly connection the whole of these parties patrol in the immediate vicinity of their posts, and send to me, weekly, a copy of the diaries kept by each non-commissioned officer or man in charge.

The Detachments surrounding the Blood Reserve are continually on the move, noting the actions of the Indians, looking for branded horses, and by their presence preventing the sale to the Indians of intoxicants.

The whole of these outposts are supplied with provisions, oats and fuel from this post, which entails no small amount of hauling.

OX TRAIN.

The ox train is utilized as much as possible, but is altogether too slow, and I recommend that the oxen be sold and that ten mules be substituted therefor. Now that the snow is on the ground the oxen are next to useless, whereas mules could be used all winter.

OUTPOSTS OF "D" DIVISION.

"D" Division finds a Detachment of 1 officer, 31 non-commissioned officers and men, with 24 horses, at Lethbridge. This Detachment is at present patrolling in the vicinity of its station, and has recently materially aided Mr. Galt in the maintenance of order amongst his miners.

From the 22nd August until the 7th October this Detachment patrolled from Lethbridge to the Cypress and back weekly. On the latter date, in pursuance of instructions received from you, a camp was established in Bull's Head Coulee, after which the Lethbridge men patrolled only to Grassy Lake, 16 miles, exchanging reports with the patrol from the former place, which again kept up the communication with the Detachment at the head of the Cypress. The water becoming very bad in the Coulee, on the 18th of October, Inspector Sanders, who was in command of the party, was ordered to move on to the tank of the North-West Company's Railway at Seven Persons' Coulee, where he remained, keeping up the patrol until withdrawn on the 18th of November. This party endured a good deal of hardship, as the snow in the vicinity of the Cypress became deep and weather very cold towards the end of October.

Although numerous reports had been circulated to the effect that Southern Indians were stealing horses in this part of the country, Inspector Sanders reports that his party never saw an Indian the whole time they were out.

INDIANS.

The Indians on the Blood and Piegan Reserves are perfectly quiet and apparently contented.

In the latter part of September some uneasiness was caused by the receipt by the Bloods of the news of six of their number having been killed by the "Gros Ventres" near the boundary line. The young men wanted to start immediately on the war-path and retaliate, but by the united efforts of Mr. Pocklington (Indian Agent) and myself they were dissuaded from so doing, and although they still declare their intention of having revenge in spring, I am inclined to think that the tribe, as a whole, will take no action in the matter.

I have been, so far, unable to visit the scene of the fight, which the "Gros Ventres" admit took place on Canadian territory, owing to the depth of the snow, but I shall do so at the earliest possible moment.

Although the Bloods are being constantly accused by the Montana, U.S., papers, of stealing horses from the other side, their reserve has been searched from end to end by United States Stock Inspector Sweeney and others, only nine horses have been claimed from them since I assumed command.

The Police at all times obtain every possible assistance from the Indian officials.

SALE OF INTOXICANTS TO INDIANS.

I would strongly recommend that the Indian Act be amended as soon as possible, and that magistrates be given power to inflict a more severe punishment on those who give or sell intoxicants to Indians. Since the introduction of hop beer a great deal of the money paid to Indians is spent therefor, and although the beer itself may not be intoxicating, the Indians render it so by boiling tobacco with it, and the sale should be prohibited to them.

BUILDINGS—MACLEOD.

I submit herewith a ground plan of this post, which shows the location of the coal-shed and stable erected this fall. (Not printed.)

The whole exterior of the barracks has been painted, battens on the buildings tightened, and double windows are now being made.

On assuming command, I found that the greater part of the zinc chimneys in use were burned out; and in accordance with your instructions I am having them repaired and, where necessary, replaced as fast as possible. Brick chimneys should be built as soon as possible.

As the lumber in the buildings has shrunk considerably since their erection, I recommend that as soon as an appropriation can be obtained, they be either clap-boarded or sided.

If it is your intention to keep 150 or 200 men, with a proportion of horses, two stables, to replace those destroyed by fire some time ago, should be erected at an early date. The log stable recently put up would then make an excellent "infirm-ary" stable.

I am, as fast as possible, having the interior of the barrack rooms whitewashed and painted by Police labor.

I also recommend that the wire on the fence around the post be removed, and that 8 feet pickets be substituted therefor.

BUILDINGS AT OUTPOSTS.

The whole of the buildings at Stand Off, St. Mary's, Kootenai, Pincher Creek and Piegan Reserve have been overhauled and whitewashed, inside and out.

At St. Mary's the Detachment built another stable for four horses without any expense to the Government beyond that for the spikes and nails.

The buildings at Pincher Creek have been plastered inside and out, rendering them very comfortable.

CORRALS.

New hay corrals of barbed wire have been built at this post, Pincher Creek and Piegan Reserve, while others of log or rails have been erected at Stand Off, St. Mary's and Kootenai.

EQUIPMENT "H" DIVISION.

The equipment of "H" Division is, with the exception of the transport and two sets of harness, in first-rate order.

"D" DIVISION.

The officer commanding "D" Division is reporting separately upon his equipment.

The requirements of both Divisions have been fully set forth in the estimates.

TARGET PRACTICE, "H" DIVISION.

Owing to the number of non-commissioned officers and men on duty from "H" Division I have been unable to complete the practice.

BUILDINGS AT LETHBRIDGE.

I append hereto a ground plan of the barracks now in course of erection at Lethbridge. They are fast approaching completion. (Not printed.)

A strong hay corral has been erected there by the Detachment under command of Inspector Likely.

FIRE PROTECTION.

I cannot too urgently recommend that a manual fire engine, with 1,000 feet of hose, be at once supplied to this post. Should a fire break out, in one of the prevail-

ing high winds, on the west side of the barracks, it will be almost impossible to save a building on the side attacked, with the limited means now at my disposal. Tanks should also be built at once.

HORSES.

The horses of this command are all in good order. The stony nature of the ground in and around the post tends to make corns very common and entails a good deal of extra labor in shoeing, but there is no sickness.

DESERTIONS.

Ten desertions have taken place from "H" during the year and four from "D" since the arrival of that Division from the north; one of the former, and two of the latter having been captured and sentenced to 12 months' hard labor, each.

I attribute these desertions to the fact that the men are led to believe that at the mines in Montana, they can command from \$4 to \$6 per diem.

DEATHS.

I regret to have to record the deaths of Regimental No. 1,809, Constable I. J. Colins, of typho-malarial fever, on the 2nd October, and Regimental No. 231, Sergeant C. Chasse, of the same disease on the 16th October. Both these men belonged to "D" Division, and are supposed to have contracted the fever at Battleford.

PROVISIONS.

The provisions and light received monthly from the contractors are of good quality.

FORAGE.

The oats are also of good quality. The hay, as previously reported, is inferior. In fact no really first class hay has been cut in this district this year.

DISCHARGES.

The following non-commissioned officers and men have been discharged from "H" Division during the year:—

No.	338,	Constable Hobbs, R.....	Time expired.
	309,	Sergeant Geldert, L. D.....	do
	1057,	Constable Woodhouse, S.....	Invalided.
	1374,	do Cowan, S. I.....	do
	1647,	do Johnston, R.....	do
	1627.	do Mowat, G.....	do

RE-ENGAGEMENTS.

The following non-commissioned officers have been, by your authority, re-engaged for one year:—

No. 919, Staff-Sergeant Saffrey, C. R.
583, Sergeant Brymner, I. G.

ARTILLERY.

I also forward herewith a return of artillery stores in my charge (not printed). I have already pointed out the necessity for the ammunition waggons, which are all that is required to render the half battery complete.

OLD FORT.

Nothing now remains of old Fort Macleod but a few logs which I am hauling up for firewood.

REPORT OF MEDICAL OFFICER.

Assistant Surgeon Kennedy's report is also forwarded herewith.

I have the honor to be, Sir,

Your obedient servant,

P. R. NEALE, 

Superintendent Commanding Macleod District.

APPENDIX F.

ANNUAL REPORT OF SUPERINTENDENT STEELE.

FORT MACLEOD, 1st December, 1886.

SIR,—I have the honor to submit this, my report for the year ending 30th November, 1886.

I took over command of "D" Division in the month of November, 1885, from Inspector Morris, and of the Battleford post and district on the 29th of December, 1885, from Assistant Commissioner L. N. F. Crozier.

At this time two Divisions of the N.-W. Mounted Police were stationed at Battleford under my orders, namely, my own ("D") Division, and "K" Division under the command of Superintendent A. R. Macdonell.

STRENGTH OF DIVISION.

The strength of "D" Division has been very uniform throughout the year, and now consists of 5 officers, 15 non-commissioned officers and 86 constables, total of all ranks 106 all told; of these four deserted, two being recaptured and sent as prisoners to headquarters. "K" Division has nearly the same strength.

There have been two batches of horses supplied to the Division: one at Battleford in April, 1886, which consisted mostly of old Police horses, and another at Fort Macleod in October, 1886, when seventeen young remounts were handed over, having been purchased by a board of officers, consisting of Superintendent Herchmer as president, and Superintendent Neale and myself as members.

The strength of the Division in horses now consists of 91, namely, 61 saddle and 24 team; attached 6 team, 1 F., 5 K.

In the early part of the year Assistant Surgeon Rolph reported that a number of the recently joined men were physically unfit for the work they would be called upon to perform in the Force, and in February last he recommended that 8 of "D" Division and 12 of "K" Division to be invalided. Later on when the weather got warmer, 20 were sent to headquarters.

HEALTH OF THE MEN.

Early in the month of August fever (typho-malarial) appeared in the post, and very soon a good number of the men contracted it. Assistant Surgeon Miller became ill from the disease on the 16th of August, and on the 17th another doctor was telegraphed for from headquarters. Until his arrival, Mr. Mackay, an ex-hospital Sergeant of the Force, who was practising in the town, was called in, and performed his duties as well as could be desired. The disease prevailed throughout the surrounding country, as well as amongst our men, some of the citizens being attacked as early as April last.

Prior to handing over the command of Battleford post to Superintendent Macdonell, two of the men of his Division died of the disease, and after my arrival at this post, two of the men, one a non-commissioned officer, died, one at Lethbridge, and the other here, of the same fever.

DISCIPLINE.

A few cases of insubordination occurred at Battleford early last winter, partly owing to the number of recruits in both Divisions, many of whom had no idea of the

nature of the work it was necessary to perform in this country, but when spring opened and drill commenced, as usual, it was possible to exercise a closer supervision, consequently discipline improved, and is now satisfactory.

Muster parades of men and horses have been held upon the last day of every month. Horses requiring it were then re-branded upon the hoof.

DRILL INSTRUCTION, &c.

Last winter was very cold, and in the early part it was almost impossible to perform any drill outside, but of course the horses were exercised and the manual and firing exercises were taught in the barrack rooms. Lectures on interior economy were given to the non-commissioned officers and constables, and, when practicable, towards spring a number of non-commissioned officers and constables were instructed in horse-shoeing.

During the month of April the command was put under instruction at spring drill. This drill, mounted and dismounted, was continued until the warm weather in July. On the arrival of the remounts both Divisions were frequently exercised together in the movements of the corps. All the officers were instructed by me to handle a Division of mounted infantry and take command of general parades which they performed to my satisfaction. The non-commissioned officers generally became proficient at drill and their other duties. During the period the command was put through a course of musketry instruction. The 9-pounder M.L.R. guns and carriages, taken over from "A" Battery, Royal Canadian Artillery, and also our own 7-pounder mountain guns and carriages were overhauled and put in thorough working order, and two gun detachments, with horses, went through a course of instruction which made them very proficient. Inspectors Howe and Wood, and Sergeant Robinson were the instructors.

Drill was discontinued in July owing to the intense heat, 95° to 105° in the shade.

QUARTERS AND MESSING.

There being no accommodation for it at the post I was unable to form a divisional constables mess at Battleford, but since our arrival at Fort Macleod this has been accomplished, and is now fairly started by the men themselves. The crockery used being their property.

Owing to the necessity of having two Divisions stationed at Battleford last winter, the accommodation for both men and horses was very limited. This could not be avoided as no other quarters were available, and the consequent crowding may in some measure account for the unusual number that appeared on the sick report during the winter.

Previous to taking over command Assistant Commissioner Crozier had put under construction a building for officers' quarters, and in the month of January lumber and shingles were by the direction of the Comptroller hauled from Prince Albert. People who had lost property during the late rebellion were employed irrespective of the part taken, those who were most in need getting the first chance.

In May the work on the new quarters for officers was discontinued. The building, at that time, was almost ready for occupation.

In the months of June and July I reported the barracks in great need of repairs, and during the latter month that new barracks, out-buildings and stables were wanted, more especially sergeants mess, artificers' shops, and recreation room for the men, also immediate stabling for thirty horses.

In June a building called the Otton House, one mile from the post, and which had been occupied by a squad of "K" Division, was vacated, and the men stationed therein placed under canvas in the vicinity of the post so as to secure more direct supervision over them.

PATROLLING.

The patrolling of the district commenced in the winter, with the approval of the Assistant Commissioner who was then at Prince Albert, and consisted of parties under the command of an officer or a non-commissioned officer visiting the outlying settlements and Indian reserves as well as patrolling around the reserves and their neighborhood. My reasons for starting this so early in the season was the general unsettled feeling that seemed prevalent amongst the settlers in the district, which feeling was almost as intense as during the time of the rebellion. The Indians were also suspicious of the Police and the whites alike, and I thought by the constant presence of small parties amongst them that this feeling might be allayed and would add to the general sense of security in the country. The subsequent state of the district proved that the steps taken in this matter were correct. Patrols were also sent to Fort Pitt, Onion Lake, Saskatchewan Landing, Duck Lake, and one patrol sent by your directions to see if any Indians were in the direction of Sounding Lake proceeded ten miles west of "The Nose" and patrolled in small parties to the north and south of Sounding Lake. No Indians were seen off their reserves without a pass, except a few vagrants who came in to Battleford, and were sent out again. The Divisions were not able to move through the district in a body, owing to the insufficiency of transport, but the patrolling in small parties has proved to be sufficient for the purpose intended.

HORSES.

I had occasion to report in March on the unfitness of the horses at Battleford post. Forty-six remounts were received from Fort Macleod and Regina in May. As soon as the grass was fit in the spring all the horses not actually required were sent out to graze. This was continued until I handed over the command to Superintendent Macdonell.

SADDLES.

The double cinch saddles, fifteen in number, for my Division and enough to make the saddles of "K" Division up to sixty in number, which were received in July last have given satisfaction; they were manufactured by Main & Winchester, of San Francisco, California. The older saddles in my Division are single cinch of the same manufacture, and are in good order.

RATIONS.

The rations supplied at Battleford were of good quality, except a small quantity of bacon and some flour which had been exposed during the rebellion. A board of officers assembled by my orders, recommended that the inferior articles above mentioned be sold. The board was approved of by you and the recommendation carried out.

MISCELLANEOUS.

The past summer at Battleford and in the vicinity was very hot and dry. Hay was much more difficult to procure than in former years, and grain and other crops have been an almost total failure. During last spring you directed me to lend to the settlers, out of the Police stores, a quantity of oats. I reported in July that there was no prospect of the oats being returned during this fall or winter owing to the failure of the crops.

Owing to certain persons wishing to build in too close proximity to the post, I telegraphed to the Comptroller in March last on the subject of reserving certain lands for Police purposes, which was done, the plans and specifications being sent to headquarters and to Ottawa.

Mrs. Burke, the widow of the late Trumpeter Burke, a constable in the Force

who was killed at Cut Knife Hill, was supplied with full daily rations during the time I was in command, by authority received from Ottawa.

I am glad to be able to report upon the good feeling that existed during last winter between the men of the Police Divisions stationed at Battleford and those of "A" Battery, R.C.A. stationed in Fort Otter until March last.

A garden was planted in the spring, but owing to the dry weather the yield was of no consequence, except as regards potatoes, and they did not come to half what should have been expected of them.

I have had occasion during the past year to report upon the necessity of a well or wells being dug at the Battleford Post. The want of this was more apparent in that matter of fire, for had such broken out to any extent it would have been impossible to extinguish the flames—the water having to be drawn up a hill from the Battle River, a distance of one and a quarter miles, which required much time to accomplish, as well as causing much fatigue. To reduce the danger of fire as much as possible, a large number of buckets of water were kept filled in all of the barrack rooms and in the guard room. *

The 24th day of May and the 1st of July were, as usual, observed as general holidays. Both occasions were celebrated by holding athletic sports.

The annual course of musketry was gone through by both Divisions, Inspector Morris, who is himself an excellent practical shot, being in charge of the range.

HAY, &c.

In conformity with your orders, in July I called for tenders for the supply of hay required at Battleford during the coming winter, asking for tenders for quantities of from fifty to six hundred tons. This would allow all to compete, more especially those settlers of a poorer class, or those who had been somewhat materially injured during the rebellion. A Mr. Lytle, of Regina, tendered at \$14.70 per ton, being lower than any one, except J. Nolin, who tendered to supply fifty tons at \$14.

BAND.

Some time ago a very good band was kept up in my Division, but upon "K" Division going to Battleford, a number of the men of the band were transferred to it, so as to equalize the recruits. This made the band a Post instead of a Divisional one, and when the Division under my command moved to this Post (Fort Macleod) the band was broken up. There are now fourteen musical instruments, which are the property of the men. I hope, when the headquarters are moved to Lethbridge, that we will be able to form a first-class band, as we have no scarcity of musicians. Sergt. Major Lake is the leader, and takes a great interest in this matter.

BATTLEFORD BRIDGE.

The police and the public generally are put to a great deal of annoyance, owing to the necessity of taking down the bridge over the Battle River just before the breaking up of the ice in the spring. An appropriation has to be made each year to cover the expense of taking the bridge down and replacing it again. I would strongly recommend that efforts be made to have a substantial structure put up as expense will be saved thereby.

FUEL.

I wish to call your attention to the quantity of fuel (wood) which was used last winter and causing large fatigues, much waste, and consequently greater expense. This could be avoided by entering into coal contracts with people residing near the

* (NOTE.—A well, 93 feet deep, has since been dug at Battleford.)

coal beds up the North Saskatchewan River, who would be able to supply at low rates.

INDIANS.

In January all Indian reserves were visited with the concurrence of the Indian Agent. I drew the attention of the Lieutenant Governor, through the Commissioner of Police, to certain complaints made by two bands of Indians, with the result that a change of instructors was made. I recommended two ex-non-commissioned officers of the Force, to fill vacant positions, which was done. They have since, I believe, given great satisfaction to the agent.

In April Poundmaker returned from confinement in the Manitoba Penitentiary. He seemed to exercise a good deal of influence, and his release appeared to have a good effect. He has since died.

During the winter and spring a number of Indian women used to come into the town of Battleford for the purpose of prostituting themselves, to prevent this one of the interpreters was sent around every morning accompanied by a constable, and all Indians not having passes from the agent, were sent back to their reserves. This course appeared to have a very good effect, which was added to by the conviction of one Daniels for keeping Indian women for purposes of prostitution.

CRIME.

Only two serious offences have been committed in the Battleford District during my command. Superintendent Cotton, of course, reports upon all cases tried in the district. Since the arrival of the Division in this district, I have sat upon several cases as an associate of Superintendent Neale. That officer reports upon the cases tried under those circumstances.

In accordance with your instructions, I handed over the command of the Battleford District to Superintendent A. R. Macdonell on the 1st September, and marched out with "D" Division for this Post. I have made you a full report of the march, as requested by you. I annex a copy of the same. Since my arrival in this district the Division has been employed in patrolling and other duties under the general directions of Superintendent Neale, who commands the district, "D" Division has been performing the patrolling duties from the St. Mary's River to the point when the "A" Division patrols connect with them at the Cypress Hills.

DISTANCES PERFORMED BY PATROLS.

Since January last a record of the miles travelled upon patrol and other duties has been kept in both "D" and "K" Divisions. The distances covered by "D" Division are 14,561 miles. "K" Division about the same distance.

OFFICERS.

I cannot close this report without remarking upon the cordial support received from Superintendent Macdonell during the time the two Divisions were stationed together at Battleford, which went far to strengthen the good feeling which existed between the two Divisions.

Inspector Wood, who performed the duties of Adjutant for a time, is a very capable officer.

The officers generally rendered me a great deal of good service, and the behaviour of the command has been satisfactory.

I forward enclosed a record of the march of the Division from Battleford to Fort Macleod.

I have the honor to be, Sir,

Your obedient servant,

S. B. STEELE,
Superintendent.

The Commissioner
North-West Mounted Police,
Regina.

— — —
FORT MACLEOD, 15th September, 1886.

SIR,—I have the honor to report for your information that, in accordance with your instructions, I handed over the command of Battleford Post to Superintendent Macdonell and marched out with "D" Division for this Post, *via* Sounding Lake, and the Marquis Crossing of the Red Deer River. I took John Longmore, a native of the country, who, owing to his long experience on the Great Plains, would be of service in finding water this exceptionally dry season.

I made short marches during the first two days so as to enable the horses to make without distress the forced marches necessary on the third and fourth days. Wood had to be carried from Battleford to Sounding Lake and from that point to the Red Deer River. After passing Sounding Lake it was found necessary to keep to the north of trails to the crossing of the Red Deer River, so as to pass through a portion of the country usually better watered than that to the southward; but, notwithstanding the course taken, there was a great deal of difficulty in knowing when or where water could be found. Large lakes, some of them several miles in extent and never known to dry up, were found without water. Streams formerly running at all seasons were, with few exceptions, dry. On several occasions, owing to the above described causes, it was necessary to halt at noon without water, against which contingency I provided by having the water-cart constantly loaded, so that neither men nor horses would suffer any inconvenience.

I reached the crossing of the Red Deer on the forenoon of the 9th instant. "C" Division, under the command of Superintendent Cotton, appeared on the opposite bank at the same time. Superintendent Herchmer was encamped at the river. He directed both Divisions to take on their waggons supplies necessary for the continuance of their march. I transferred to Superintendent Cotton two narrow gauge for two broad gauge waggons. I handed over to his charge the "K" Division men and horses, with the exception of four horses, and transferred their loads to the bull team from Fort Macleod. John Longmore, as per instructions, accompanied "C" Division for the remainder of their march. I was obliged to keep the four "K" Division horses to haul the remaining waggons of my Division. Before leaving the Red Deer I gave Superintendents Herchmer and Cotton a table of the distances from one pond or stream of water to the next for the whole distance to Battleford from that point. This will enable "C" Division to move without making many "dry camps."

I crossed the Red Deer on the morning of the 10th inst.; the ford was good. The hill on the right bank was very difficult to ascend, but the men and horses worked so well that we saw the last glimpse of the river in one hour from the time we broke camp.

From the 10th until I reached Blackfoot Crossing, water was within easy reach as the trail was defined. From the latter place to Fort Macleod, which the division reached in two days and one hour, the intervals between water were about twenty miles. The division marched into Fort Macleod on the morning of the 14th. I had camped at Willow Creek the night previous, it being better to do so than come into Fort Macleod in the evening. The longest day's march between Battleford and

here was fifty-eight miles ; the shortest, seven miles. Two horses of " D " and one of " K " Division were lost at Grand Coulee, fifty-five miles from Battleford. I had a search made, but time would not admit of it being more thoroughly done. I considered it was of great importance that " C " Division should not be kept waiting at the Red Deer, consuming rations and forage that would be required for their march. I reported the circumstance verbally to Superintendent Cotton, requesting him to send Longmore and a couple of men to look for them on their way back, Longmore having told me that he could certainly find them in the goose grass lands, about ten miles south of the trail. The routine of the march was as follows :—Reveille at 4.30. March at six o'clock. Halt for dinner at 10 or 10.30 (if possible). March again at 1 or 1.30. Halt at 5.30 or 6 p.m.

(Note.—The three horses were subsequently recovered.

The behaviour of all ranks was all that could be desired, with the exception of one case of neglect of duty on picquet on the third of September.

I have the honor to be, Sir,

Your obedient servant,

S. B. STEELE,

Superintendent, Commanding " D " Division.

The Commissioner
North-West Mounted Police,
Regina.

APPENDIX G.

ANNUAL REPORT OF SUPERINTENDENT PERRY.

NORTH-WEST MOUNTED POLICE, "F" DIVISION,
PRINCE ALBERT, 30th November, 1886.

SIR,—I have the honor to submit for your information my annual report for the current year.

In my last report I called your attention to the anxious and restless feeling which existed in the district as a result of the rebellion.

Fears were entertained that the Indians would commit small depredations and be a continual source of trouble and apprehension.

In December last and again in June, the people were very much excited and alarmed through senseless rumors being circulated, which, on enquiry, always proved to be without foundation.

Gradually, however, the feeling of danger from the Indians exhausted itself and confidence, equal to that which existed prior to the rebellion, was restored.

The behavior of the Indians has been unusually good, they have remained, with very few exceptions quietly on their reserves, and worked well at their farms. In June, a considerable number of Cree and Sioux Indians visited Prince Albert and camped in the vicinity. This caused some alarm to nervous persons.

The Sioux were here for the purpose of working in the place. With very little trouble, the Cree Indians were persuaded to return to the reserves, and the Sioux to move across the river, and camp on the north side, close enough to carry on their work cutting wood, hauling water and odd chores of that nature. The tribes which joined the rebels, have settled again on their reserves. I was particularly struck with the large amount of work performed by Beardy's Indians, a rebellious tribe, when I visited their reserve in June; they had done a great deal of fencing, and put in a large crop which was growing finely. Unfortunately a severe hail storm destroyed it the next month.

Even White Cap's band of Sioux Indians made a serious attempt at farming. His reserve was visited by one of our officers in May for the purpose of obtaining a census of the band. Inspector B  gin, the officer in question, reported that they were very anxious to get on with their farming.

The absence of crime amongst such a large Indian population, upwards of 2,000, calls for notice. With the exception of a case of wife-beating there has been no crime whatever. I have not even received a complaint by any person against an Indian, nor have I heard of them threatening or troubling settlers. Ofttimes hungry, poorly clad and suffering, still they have not helped themselves, but applied to the Indian Department for succor, which is usually liberally granted.

This absence of crime, the large amount of work done by them during the past year, and the very small number that have wandered from their reserves, show a material advance toward civilization.

The half-breed population would appear to have forgotten the late troubles.

Last winter considerable suffering existed, but not to the extent represented. They were assisted largely by freighting the lumber for the Police barracks at Battleford, forwarded from here. As far as possible the needy half-breeds only were employed.

Oats and supplies were advanced from Police stores, at contract rates. Upwards of \$2,200 were distributed in this district, an equal amount being given the half-breeds of the Battleford district. The half-breeds expressed themselves as very grateful to the Government for the considerate and liberal treatment given them.

Very little farming was done in the half-breed settlements this past summer. Freight was fairly plentiful, but, owing to the competition offered by farmers, living along the line of railway, who took it on account of the failure of the crops, the rates were lower than ever known before.

I apprehend that the same cry will be made for assistance as last year and in many cases it will have to be afforded.

CRIMES.

As you are aware, several crimes of a serious nature have been committed in this district during the past year. The principal offences are as follows :—

In December last, a quantity of beef which appeared to have been unlawfully killed, was discovered on the prairie, some five miles south-east of the town. Two days later, information was given the Police, and an immediate attempt was made by us to discover the criminals. Certain parties were suspected, but no clue could be obtained. Some days after, the beef, which had been removed from the place where it was found, was reported by a farmer as having been discovered by him hidden in his strawstack quite close to his house. Half-breeds and Indians were accused by some of having committed the depredation ; but this was not true, as boot tracks were seen about the place, and the killing had been done skilfully. Until this summer not the slightest evidence could be obtained. However, near the scene of the killing, a skin was found which was identified as being that of an animal belonging to a lumbering firm of this place. This animal had been last seen tied up to the fence of J. A. Matheson. The crime was so closely brought home to him that on his preliminary examination he confessed his guilt. He afterwards confessed all the circumstances in connection with the case. His confession implicated two others, one of whom was arrested. It also implicated two others of having received stolen cattle. A conspiracy, according to him, had been formed to gather in and claim all cattle strayed during the rebellion, and for which, claims had been made for compensation, knowing well that the owners would not trouble to search for them. It was therefore of importance that the criminals should be detected and punished. In the preliminary examination which was held before three Magistrates, three persons in three cases were committed for trial. In two the evidence was so strong that bail was refused. However, when the cases came before the Stipendiary Magistrate two were heard and dismissed, the third which rested principally on the evidence of an accomplice was not heard at all.

I regret exceedingly that convictions for the serious crimes perpetrated were not secured against the guilty parties whoever they may be. It is my painful duty to report that a very widespread feeling existed for the persons accused, whether they were guilty or not. People of high-standing showed strong sympathy. Evidence was produced for the defence which could well be doubted. Not only has this case produced this sympathy for crime, but in other cases it has been plainly manifested. Petitions have been forwarded to lessen the penalties where laws of the country have willfully and knowingly been broken. So notorious is this that it has disheartened us in attempting to secure criminal convictions. There seems to be an absurd idea that the dismissal of a charge means a snub to the Mounted Police, whereas it strikes home at the root of society, and threatens the property of the very men who jeer and flaunt.

The most serious crime during the year was the robbery of the Prince Albert mail, near Humboldt, in July last. As this was the first attempt at highway robbery in the territories, it created much excitement, and it became imperative that the perpetrators be discovered. The first notification of the robbery was received by you at Regina, the same evening. The report was very inaccurate and misleading. It stated that six (6) masked men had effected it. It was at once assumed that they were American desperadoes from the Missouri, who were seeking fresh fields. If they succeeded in getting away free it was felt that it would be but the beginning of stage robberies such as had been prevalent in the States. As my

division was then at Regina, you directed me to send detachments east and west by rail to Broadview and Moose Jaw; thence to move north, carefully covering the country through which they would likely escape. The detachment of eight Non-commissioned Officers and men, with horses and transport, left by the east-bound express two hours later. The detachment of seven men, under command of Inspector Bégin, was delayed going west, awaiting a train. The following day the remainder of the division, consisting of 47 Non-commissioned Officers and men marched for the north. At Qu'Appelle, I proceeded ahead of the division to the scene of the robbery in order to obtain a true account of the matter, and procure accurate descriptions of the robbers. I ascertained that it was the work of one man, who had, beside robbing the mail, held up and gone through a large party of five men early the same morning. This party was asleep in a tent when awakened by the firing of a couple of shots. They were ordered out singly, and tied up one by one, with the exception of two. The robber searched Mr. Swanston, a wealthy resident of this place, evidently expecting to find a large sum of money on him. Being disappointed, he with reluctance demanded the money belonging to the other members of the party, receiving it he rode off without opposition, to treat the mail stage in the same manner. About 1 p.m. of the same day, the 17th July, he stopped the mail by presenting a double-barreled shotgun at the occupants of the stage. Ordering all down he tied them up as before with the exception of one whom he detailed to attend to the horses. Borrowing a knife for the purpose, he cut open the mail bags, abstracted the registered letters, leaving valuables such as watches. He then left them and disappeared. The next day the driver of the mail going south, found a package of registered letters in the road near the scene of the robbery. They contained cheques, vouchers, etc., other than cash.

The robber must have secured over \$1,300. He took nothing belonging to the passengers, although he knew one of them had \$200 in his possession.

No attempt was made to disguise himself. He evidently knew the country and the people. Apparently it was his first attempt.

The detachments sent out from Regina arrived at Prince Albert without having discovered any trace. They had covered the routes of escape thoroughly, and had the robbers, as supposed, been Americans, they would, in all probability, have been captured, as a party had been sent out from Prince Albert by Inspector Cuthbert, but owing to the delay in transmitting the telegram, the wire being grounded, they were unable to effect anything.

On August 18th, Hart, the mail driver at the time of the robbery, reported seeing the highwayman, a man named Garnett, in Prince Albert. He was at once arrested, and the evidence produced on his preliminary examination was so strong that he was committed for trial, bail being refused. Subsequently he was sent to Regina. A search warrant was issued by me, and careful and diligent search made in Garnett's house to find the money. The mud floor was dug up and the surrounding bush examined, but unsuccessfully. Clothes were found in the house which exactly answered the description given of those worn by the robber.

Early in October Garnett was tried at Regina and sentenced to 14 years' imprisonment in the Penitentiary.

The money stolen was, I have conclusive evidence to show, secured by one Smith, about the middle of September. This man was in prison at Regina with Garnett. Immediately on his release he posted north to Garnett's place, employing a French half-breed at Touchwood Hills as guide. The money was buried in a tin can on the south side of the river, not far from the Hudson Bay Crossing, where Garnett's ferry was. Smith was very free with his money, offering \$5 to the ferryman for crossing him over, insisting on paying another \$5 for his dinner, and making a present of a bag of flour at the same place in return for a few bannocks. Although the people who saw him suspected that he had secured the stolen money, they did not inform us, and it was purely by accident that, some two weeks after, one of the sergeants happened there and learned of it. Steps were at once taken to secure Smith, but he had escaped across the lines. The half-breed whom he employed as

his guide was arrested, but being only an important witness, was allowed to go, to appear when called for.

The facts I have just stated disperse any doubts which have arisen as to Garnett's guilt.

A case of burglary occurred in the town last February. The store of Agnew & Co., hardware merchants, was broken into and some \$300 worth of money and cheques stolen. The cheques and other papers, which were of no use, were found along the street in another part of the town. On the matter being reported steps were taken, but without success. The only clue was a common make of glove. All the stores in the town were visited to have the glove identified as having been sold, but without success. The burglar was evidently familiar with the town, and either a resident of the town or of the vicinity.

By far the largest amount of Police work arises from infractions of the North-West liquor law. Fourteen convictions have been secured in the year and \$1,420 collected in fines for cases arising from dealing in liquor. If the costs be added, which reach over \$100, the total amount collected would aggregate \$1,600.

In every case it is to be remarked that the information has been laid by the Police or by others on compulsion, having been discovered with liquor in their possession. There has not been a single voluntary civilian informer.

The profits realized by the dealers in illicit liquor far exceed the amount of the fines collected.

The expenditure incurred for illicit liquor, together with that for permit liquor, which reaches a very respectable sum, forms a tremendous drain on the resources of the district. The present liquor law, as worked under the permit system is not a success, does not decrease drunkenness to any great extent, and takes from the country a large amount of money.

Permits are often used to cover unlawfully obtained liquor; they are sometimes held by dealers who for the time covered by the permit can laugh at the law; they are very frequently abused; they prevent the carrying out of the law.

I am of the opinion that the regulations guarding the disposal of alcohol for medical purposes should be more stringent. Druggists should be heavily bonded not to infringe the laws. They have every opportunity to take advantage of the privilege granted them, they can easily cover their tracks, and thus render conviction difficult.

The law as at present is not popular with any party, and does not receive the support and approval of the people. A discriminating law cannot be upheld by the people.

SMUGGLING.

Some cases of smuggling have occurred during the summer. In August last a band of twenty-five horses, mares, &c., belonging to William Drain, of this place, were seized for evading payment of Customs. These horses had been purchased at Sun River, Montana, and driven into the country by an unfrequented trail, crossing the Canadian Pacific Railway west of Swift Current, and then following down the South Saskatchewan. It was thought that no one would suspect at a place 350 miles north of the boundary. The band was met some forty miles from here by one of our officers. He suspected smuggling, and at once reported it. Sufficient evidence was secured, and the band was accordingly sold by order of the Customs authorities. The seizure and sale, as you are aware, have recently been confirmed by the Minister of Customs, and the proceeds of the sale forfeited to the Crown. A petition was circulated in this place and forwarded to the Minister of Customs, asking for leniency. As the act was committed intentionally and knowingly there were no extenuating circumstances.

Another large party of four men with three waggons and thirteen horses was arrested and brought in by a detachment sent from here on information received from headquarters. They produced satisfactory proof to show that they were intend-

ing settlers, and had unknowingly broken the law. The Customs Department, therefore, directed that they be released on payment of all expenses in connection with their arrest.

As an immediate result of the above seizure, several half-breeds came in and reported horses and paid duty. It seems that smuggling in a small way had been carried on in previous years undetected.

As will be seen by the record of criminal cases attached to this report, a number of crimes of a trivial nature have been attended to by the Police.

In every case of a crime coming under our notice, continuous and persistent efforts have been made to detect the criminals.

PATROLS.

The past year has been a very busy one for the Division.

During last winter monthly patrols, consisting usually of an officer and five non-commissioned officers and men visited the Indian reserves and other portions of the district, in order to ascertain the state and feeling amongst the Indians, and gain general information.

In May Inspector Cuthbert arrived from Regina with a detachment of twelve men, bringing twenty-four remounts. The horses, with the exception of those left along the trail, owing to accidents, arrived in fair condition, considering that they had only reached Regina a few days from Eastern Canada.

Inspector Bégin with a detachment of 20 non-commissioned officers and men and 17 horses proceeded to White Cap's Reserve 110 miles distant, and 15 miles south-east of Saskatoon. The Lieutenant Governor desired to have a correct census of the Sioux Indians on White Caps Reserve. This information was obtained and forwarded.

On 2nd June the Division left Prince Albert to patrol the district and thus enable every man to become acquainted with its topography, trails, settlements and to teach them prairie travelling.

The marching out strength was:

Officers.....	3
Non-Commissioned and Men.....	73
Saddle Horses.....	28
Teams.....	28
Heavy Waggon.....	13
Buckboard.....	1

In addition to the baggage and other stores, two weeks' supply of rations and forage was taken. A detachment of 20 men in charge of a sergeant was left at Prince Albert.

St. Laurent, Batoche, Duck Lake, Carlton, and the Indian Reserves in the vicinity were visited. The men were instructed in their camp duties and exercised in scouting and guards.

While at Carlton on 12th June, a telegram was received from you ordering the Division to Troy. As I was in Prince Albert, Inspector Cuthbert moved it to Batoche crossing the South Branch in a small ferry barge worked by oars. On Monday noon the Division marched for Qu'Appelle carrying light baggage only, and forage as far as the Salt Plains half way, where a supply was sent to meet it.

On Saturday it arrived at Qu'Appelle, 240 miles distant; $5\frac{1}{2}$ days being the time from Batoche, an average of 44 miles per day. Owing to the very hot weather I travelled at night altogether, so that the horses stood the trip very well. It was however trying to the men, some of whom were only recruits and unaccustomed to the saddle. Nearly 13 hours each day were spent in the saddle.

From Qu'Appelle by your orders the Division was moved to Regina, where it remained for over two weeks. It was under canvas most of the time but during the extremely hot weather was moved into the drill shed. While at Regina it was inspected by you, both mounted and dismounted.

On 9th July, you ordered it to Long Lake. I proceeded to a point on the west side of the lake some 32 miles from Regina. While there a detachment of 10 men, commanded by Inspector Starnes, was sent on the east side of the lake to New Strasbourg, a German settlement 30 miles further north. Small parties were also despatched in search of an illicit still reported as being in operation in that neighborhood.

On 16th July the Division returned to Regina, where it was inspected by the Right Honorable Sir John A. Macdonald.

The parade state for the inspection was :—

Officers	4
Non-Commissioned Officers, Constables	42
Saddle horses.....	46
Team do	26
Waggons.....	13
Teamsters.....	13
Total men, 59; horses, 72.	

The camp was also inspected.

The evening of the inspection news of the mail robbery was received. The movements of the Division in consequence have already been mentioned.

The whole Division arrived back in Prince Albert on 28th July, having been absent and continually travelling since 2nd June, and having covered over 745 miles.

The horses returned in good condition; but one had been sick during that time, and that only for a few days.

The transport was in good order and the harness without any break.

Detachments were sent out from the post in the early part of August very frequently. One, of 13 men and 14 horses, proceeded to the Elbow of the South Saskatchewan, 150 miles distant.

On 23rd August a detachment of 15 non-commissioned officers and men were sent to Batoche for permanent duty at that post.

On the 25th of the same month Inspector Bégin with 30 non-commissioned officers and men and 31 horses proceeded to Battleford, 150 miles, to relieve "D" Division which was ordered to Fort Macleod.

While at Battleford Inspector Bégin reports that his men were steadily employed.

Escorts were furnished the mail as far as Eagle Creek, patrols were sent to the Indian Reserves, fatigues of men and horses furnished Battleford Post, and other duties performed.

Early in September Inspector Bégin with 14 men and 16 horses was sent in pursuit of a band of Cree Indians, which had left the reserve and were travelling westward. With some difficulty the trail of the Indians was followed. They were come up with five days out, in the vicinity of Devil's Lake, south of Fort Pitt. The band had divided as only thirty men were found, and these, with little difficulty, were pursued by Inspector Bégin to return.

The detachment returned to Prince Albert on 28th September with transport and equipment in excellent shape. The horses showed signs of hard work. One had died at Battleford of inflammation of the bowels. Inspector Bégin reported that the behavior of the party had been very good, and that he had not a single complaint to make.

In September escorts were furnished Indian treaty payments as follows:—1 non-commissioned officer, 3 constables, 5 horses, at John Smith's and Fort à la Corne, about 7 days. 1 non-commissioned officer, 3 constables and 5 horses, at Sturgeon Lake, Snake Plains and other reserves north of the Saskatchewan, about 8 days.

In this month a detachment was sent out from Batoche up the Saskatchewan to look out for certain smuggled cattle and horses, which were ascertained to have come from Moose Jaw.

During October detachments were sent to Carrot River frequently, working up

cases of crime, to South Branch to tear down and haul in a warehouse, owned by the Police, and to Batoche with supplies for the winter.

Since August the mail going north and south weekly between Batoche and Humboldt, 140 miles, has been escorted by us. The detachment at Batoche furnished two mounted men as far as Humboldt, whence they returned north with the incoming mail. The Touchwood detachment escorted the mail going north to Humboldt and returned with that going south.

This duty has been very trying to the horses. I trust that the recommendations made by you for the establishment of Money Order offices may be shortly carried out, and thus relieve us of a trying and destructive duty to our horses.

TRAINING OF THE DIVISION.

During the past year, the training of the Division in both mounted and dismounted work has been carried on as far as possible.

In December last owing to the very fine weather, I was enabled to carry on rides in the open air during the whole month. The recruits who had been transferred to the Division in the previous month were thus given useful instruction.

In the winter months, owing to the severity of the climate very little drill can be carried on. However daily rides out were instituted and carried on; they kept both horses and men in good condition. A weekly parade for every man in the Division was also carried out, which kept the men up to their dismounted work.

About the middle of April a thorough course of spring drill was commenced and continued with as little interruption as possible.

The officers of the Division carried on the drill personally, acting in most cases as instructors.

Setting up drill, squad drill, manual and firing exercise, Division and field movements as laid down in the mounted infantry regulations, both mounted and dismounted, and skirmishing.

Classes were formed for instruction in riding of the recruits who had joined during the winter.

A complete course of musketry instruction was commenced but not entirely completed as the Division was ordered on patrol early in June. Four classes were formed which were in turn instructed by me. Position drill and judging distance, instruction in the mechanism of the Winchester carbine was also given and lectures on the theory of shooting. After completing their instruction, preliminary target practice was carried out under Inspectors Cuthbert and Bégin. All the men except those absent on duty fired 40 rounds each, at ranges of from 100 to 400 yards. This practice was fairly successful. In consequence of important work which occupied the Division all summer and fall no opportunity had been afforded for completing the final practice. It will however be carried out as soon as possible.

SEVEN-POUNDER GUN.

The seven-pounder gun attached to the Division was put in repair last winter. A new trail limber axle was put in the carriage. The gun is in serviceable condition.

A squad has been told off and instructed in working the gun. A large supply of ammunition for this gun was received a short time ago.

QUARTERING OF THE DIVISION.

Last winter the Division was quartered in rented buildings, situated in the eastern part of the town. These buildings were widely separated, and were mixed up with those occupied by civilians, some of whom were keeping saloons.

It was therefore difficult to keep up constant supervision over the men. The duties were greatly increased, the men having to walk over half a mile, in some

cases, to attend stables. On 20th April the Division was again placed under canvas. It did not move into quarters again until October. Much the same buildings were occupied, but the stables were divided and a portion moved to the buildings of Messrs. Moore & McDowall; this obviated the necessity of compelling the men to walk a long distance for stables. Other material improvements were carried out by your authority; porches and double windows were added to some of the buildings, the roofs of others were repaired, and temporary saddle and mess rooms were built.

The whole of this work was carried out by our own men, and was most expeditiously and thoroughly done. A liberal allowance was made them by the Public Works Department.

As a consequence of the work done, the Division is most comfortably and warmly housed for the winter, and the duties are carried on with more facility and less labor.

I would call your attention to the fact that "F" Division has been temporarily quartered since the spring of 1885, that it has been therefore intimately associated with civilians and consequently more opportunities and inducements have been offered for the commission of irregularities. It has, however, conducted itself very well and I have received no complaints against the men from civilians.

DIVINE SERVICE.

During the winter and up till the time the Division was ordered away, Divine Service was held twice each month. Every facility is offered the men for attending Service.

CONDUCT OF THE DIVISION.

The conduct of the men has been excellent, with the exception of the desertions no serious crimes have been committed. The punishments have been light.

A total of 49 entries appear in the Defaulter's Sheet for the twelve months. An average of about one entry per man every two years.

DEPOSITS IN THE SAVINGS BANK.

A total sum of \$976 has been deposited by the Division. There are twenty-two depositors, who each deposit an average amount of \$44 per year.

HEALTH OF THE MEN.

The health of the Division has been very good in the past year. There has been no disease amongst the men. Four of the men who visited Battleford during the summer were attacked by the fever which was prevalent there. They, however, quickly recovered, and became fit for duty. The average daily sick report has been 3.05. I would call to your attention the almost entire absence of preventable disease amongst the men.

HEALTH OF THE HORSES.

Although there has been no contagious disease amongst the horses, the number of deaths has been large. This I attribute, during the early part of the year, to the effects of the hard work, exposure and bad forage during the rebellion.

The horses cast and sold were those which had been at Prince Albert in spring of 1885. After the troubles were ended large parties and detachments were despatched to other posts; the best horses were naturally taken, and consequently a large number of worn out and broken-down horses fell to the lot of "F" Division. As will be seen by a previous portion of this report a great amount of work was done by the horses during the past summer. The horses, which were thoroughly acclimatized, stood the work well without, any exceptions.

To completely horse the Division about 25 remounts are required.

WINCHESTER CARBINE.

I beg to call your attention to the poor sight with which this carbine is furnished, I frequently tested it during last summer, and found many of them inaccurate at 100 yards, in nearly all cases shooting high. This is a matter of importance. I have compiled a table of the trajectories of the Winchester carbine which will be found attached to this report. The initial velocity I obtained from the Winchester Arms Company.

A glance at the table will show the trajectories to be much higher than those of a military arm.

I have the honor to be, Sir,

Your obedient servant,

A. BOWEN PERRY,
Superintendent Commanding "E" Division.

TRAJECTORIES OF WINCHESTER CARBINE.

RANGES, from 100 to 1,000 yards; CHARGE, 75 grains; WEIGHT OF BULLET, 350 grains.

Range. Yards	Remaining Vel. Feet.	Range.										Time. Seconds
		100 Yards.	200 Yards.	300 Yards.	400 Yards.	500 Yards.	600 Yards.	700 Yards.	800 Yards.	900 Yards.	1,000 Yards.	
0	1,234	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Seconds
50	1,197	2 1 ¹⁰	2 4	2 4	3 9	5 2	6 9	8 5	10 3	12 1	14 1	1.200
100	1,110	0	2 7	2 7	5 7	8 6	12 0	14 4	19 1	23 1	27 2	.2808
200	991	1 2 ¹⁰	0	0	7	9 4	14 10	20 5	26 4	32 8	39 4	.5398
300	916	.....	.....	.....	4	6	14 4	22 4	30 3	39 2	48 1	.8516
400	854	.....	.....	.....	0	6	.....	.....	.....	.....	.....	1.195
500	800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.537
600	753	At 100 yds.—Pine.....	.....	.....	.....	0	10 0	20 1	32 8	42 0	53 10	1.947
700	711	Earth. At 100 yds.—Stopped by a sandbag 13	.....	.....	.....	.....	.....	13 8	26 12	40 6	55 7	2.358
800	674	At 200 yds.—Pine.....	.....	.....	.....	.....	.....	0	18 6	33 6	50 10	2.786
900	640	Earth. At 200 yds.—Stopped by a sandbag 10	.....	.....	.....	.....	.....	.....	.....	0	42 2	3.246
1,000	610	.....	.....	.....	.....	.....	.....	.....	.....	.....	25 6	3.750

Muzzle Velocity, 1,234 feet per second.

A. BOWEN PERRY,
Superintendent.

APPENDIX H.

ANNUAL REPORT OF SUPERINTENDENT GRIESBACH.

FORT SASKATCHEWAN, 30th November, 1886.

SIR,—I have the honor to submit my annual report for the year ending 30th November, 1886.

In the fall of 1885 the Mounted Police in Edmonton District were largely increased, enabling me to thoroughly patrol the whole country, all the settlements being constantly visited, and there has been a marked absence of serious crime. Two cases of horse stealing, and one of cattle killing, were reported to me, but so long after the offences were committed, that the suspected parties had already got out of the country.

It has been found extremely difficult to entirely suppress the illicit sale of whiskey in this large district, and I would strongly recommend the employment of detectives in this duty.

During the summer escorts were furnished to the mail on the Calgary route, and the service, although very hard on horses, was continued until cold weather set in and the necessity no longer existed of accompanying the mails, but outposts were established at various points on the road, from which a careful watch was kept on all travellers, and patrols were sent out whenever possible. In addition to the other duties performed by "G" Division, escorts have been furnished to the officials of the Indian Department at all the annual payments made in the district.

The Indians have been very quiet, and appear to have given great attention to their farms during the last season.

A good harvest has enabled us to purchase all the oats required for the Division in the neighborhood, and a good market has thus been afforded the settlers.

The constant patrolling has been extremely hard on horses, many of which had already suffered from hard work and exposure in the earlier part of 1885, and it will be found necessary to cast and sell a considerable number. Many of these, however, being large, will sell well for farm purposes, as although used up for fast work, they will do useful service on farms. These will have to be replaced as soon as possible, to enable the spring work to commence.

During the early part of the year there were several cases of insubordination which were promptly suppressed, and those implicated sentenced to severe punishment, which sentences after their cases had been investigated by Superintendent Herchmer were confirmed. Since then the conduct of the Division has been excellent and the headquarters having been removed to Fort Saskatchewan where the buildings have been repaired and some small additions made generally by Police labor, the men have been very much more comfortable.

During the summer with fifty men I joined the camp of instruction at Calgary, where we remained a month, and, after being inspected by the Right Hon. Sir John A. Macdonald, returned to the Edmonton District.

The route taken by the numerous patrols supplied by "D" Division will be found on the attached map.

I have the honor to be, Sir,

Your obedient servant,

A. H. GRIESBACH.

Superintendent.

APPENDIX J.

ANNUAL REPORT OF SUPERINTENDENT JARVIS,

HEADQUARTERS NORTH-WEST MOUNTED POLICE,
REGINA, 30th November, 1886.

SIR,—I have the honor to report as follows on the various duties performed by the men under my command, since my appointment as Superintendent in the North-West Mounted Police.

I reported for duty at Regina on 15th April last, and on 1st May was placed in command of the Headquarters District. This district embraces the line of the Canadian Pacific Railway and the country on both sides of it, from Moosomin to Moose Jaw, a distance of 180 miles, together with an outpost at Fort Qu'Appelle, 20 miles north of Qu'Appelle Station.

Detachments were distributed for duty as follows :—

Moosomin.....	1 corp.	1 const.
Broadview.....	1 do.	1 do.
Fort Qu'Appelle.....	1 sergt.	4 do.
Qu'Appelle Station .....	.....	2 do.
Regina (town station)	1 corp.	1 do.
Moose Jaw.....	1 do.	1 do.

There were also 3 constables employed as Mail Clerks, in charge of the mails between Moose Jaw and Calgary, but this service was discontinued at the end of June, when the Post Office Department replaced my men by their own officials.

During the time I was in charge of the district, viz., until the end of July, these detachments remained of the strength above stated; except that two constables were withdrawn from Fort Qu'Appelle (when it was not considered necessary to keep such a large detachment) and one or two individual changes were made along the line of railway.

The work of these detachments consisted largely—in addition to the ordinary Police work of the prevention and punishment of crime—in the suppression of illegal liquor traffic. To this end, a thorough search was made of all trains passing along the line of railway, with the result that a large quantity of contraband liquor was seized and destroyed. Supervision was also exercised over the permits granted by His Honor the Lieutenant Governor to bring liquor into the North-West Territories; lists of such being forwarded to the outposts, and checked by them with the actual shipments.

The detachments in my district were visited and inspected several times, and Sergeant Fyffe was placed in general charge of them (with headquarters at Qu'Appelle Station) which work he has performed most satisfactorily. I beg, on this account, to bring this sergeant's name before you for favorable notice.

At the end of July, I handed over the district to Inspector Allan

DEPOT DIVISION.

I was placed in command of the Depot Division at the beginning of May, having the supervision of the pay and clothing of the men belonging to or attached to that division.

The principal work in this division was the drill and training of recruits, carried out under the immediate orders of the adjutant; together with the ordinary routine of guards, picquets, prisoner's escorts, fatigues and other work, at which it is necessary to employ men at headquarters.

On 21th July the barracks and riding school were visited by Sir John Macdonald, accompanied by Mr. White, the Comptroller; and the men of the division were also inspected on parade.

At the end of July, I handed over the division to Inspector Allan.

"B" DIVISION.

After handing over the Headquarters District and the Depot Division to Inspector Allan, as stated above, I proceeded to Wood Mountain Post, and on the 1st August took over the command of "B" Division from Superintendent Gagnon, who returned to Regina.

PATROLS.

The work of this Division consisted in patrolling the country, parallel to the boundary line between Canada and the United States, from the western limit of the Province of Manitoba to the crossing of the White Mud River, on the trail from Wood Mountain to the Cypress Hills—a distance, in a straight line, of 290 miles, or about 335 miles from one end to the other, along the trail as travelled.

The patrols were so arranged as to make a continuous chain all along the line, and to connect every week (at the crossing of the White Mud River) with the patrol of "A" Division from East End Post. The entire distance was traversed twice in each week, being divided into seven different patrols, each of which acted independently of the others, but made connection with them at the end of their respective routes. The scheme has already been submitted to you in detail, showing the strength of the parties, and the route taken and the time occupied by each.

It was the duty of these patrols to thoroughly examine the country over which they passed, to interrogate all strangers they might meet *en route*, and learn their business, to look out for stolen or stray horses or cattle, to aid, where possible, in the suppression of prairie fires, and to enquire into their origin, and to exercise general Police supervision over their line of country. Diaries were kept at the outposts, and written reports made by each patrol on returning from a trip, so that the headquarters of the Division (at Wood Mountain Post) was kept constantly informed of everything going on in the district.

These patrols continued until the beginning of November, when, as all travel through the country had ceased, they were no longer necessary, and were withdrawn, the whole Division, with the exception of the winter detachments, returning to Regina on the 21st inst.

WINTER OUTPOSTS.

The following list shows the strength and location of the outposts remaining in the district:—

Wood Mountain Post—1 Sergeant.

do 5 Constables.

do 1 Special Constable.

do 6 horses.

do 1 pony.

Willow Bunch—2 Constables.

do 1 Special Constable.

do 2 horses.

do 2 ponies.

Carlyle—1 Sergeant.

do 5 Constables.

do 6 horses.

Alameda—2 Constables.

do 2 horses.

The special constable at Willow Bunch will act as mail carrier during the winter, and will come to Regina once every month.

CATTLE AND HORSES.

Six thousand head of cattle and 250 horses have been imported from the United States by the Home Land and Cattle Company, of St. Louis, Mo., and located on their range at Wood Mountain, where their headquarters are established, seven miles west of the post. Eighty head of cattle have been located on the Chapleau rancho, fifteen miles south-east of Willow Bunch, and about 100 ponies have been imported by various settlers round the mountain.

PRAIRIE FIRES.

All the grass, and a great deal of hay, was destroyed in the neighborhood of the Souris River and Alameda by prairie fires. In nearly every case these fires were reported to have come down from the Canadian Pacific Railway. Fires also occurred in the Dirt Hills and along the Regina trail.

CRIME.

There was an entire absence of crime in this district.

SUGGESTIONS.

In conclusion I beg respectfully to offer the following suggestions, which arise out of this summer's work, and which, I think, will conduce to the better performance of the duties in this district :—

1. The old buildings at Wood Mountain Post should be destroyed, the logs of which they are built are rotten, the roofs falling in; and although some portions have been patched up and made habitable for the winter, the buildings are neither healthy nor safe for future use. The site is also bad, being low and close to a swamp, and if a new post is to be built, it should be located about half a mile south-west on a higher bench.

2. A hut and small stable should be built at Willow Bunch, where an outpost must always be kept, being in the middle of the Half-breed settlement and commanding several trails.

3. The Bell tent is not suitable for a permanent camp, being too low to admit of standing beds, and not affording sufficient protection from the weather. The square (or house) tent, about 24 feet by 16 feet, with a 4-foot wall, was found to answer best.

4. Camp kettles for prairie use should be made of stronger material than the sheet tin generally used. The "Flander's" kettle (as used by the militia), I have found the most useful and durable.

5. The Police uniform fits too well for a man actively engaged in rough prairie work, and is soon spoiled by duties required round a camp fire. I would suggest the issue of a "prairie dress" (in lieu of certain articles as at present issued) which would consist of dark brown cord or velveteen breeches, long boots and spurs, a heavy blue flannel shirt (over which the stable jacket could be worn when required) and a broad-brimmed hat of soft felt to complete the outfit. By adopting this, personal comfort and a uniform appearance would be gained, while the regular uniform would be saved for parade and duty in settled districts. The forage cap is no use at all on the prairie.

6. Delay has frequently been experienced in sending telegraphic messages to and from Wood Mountain Post. This, no doubt, occurs at Moose Jaw, where the messages

are repeated on the Canadian Pacific Railway line and are probably delayed by press of business. If the Government system of telegraphs was extended from Moose Jaw to Qu'Appelle, *vid* Regina, a through line, under one control, would be established from south to north and would greatly facilitate the transaction of Police business.

7. For the use of detachments away from headquarters of their Division I would recommend a portable forge. Much time is lost in sending horses away to be shod, and even if no regular farrier is present a handy man can often be found to set a shoe.

I have the honor to be, Sir,

Your obedient servant,

E. W. JARVIS,
Supt. Commanding "B" Division.

The Commissioner,
North-West Mounted Police,
Regina.

APPENDIX K.

ANNUAL REPORT OF SUPERINTENDENT ANTROBUS.

CALGARY, 30th November, 1886.

SIR,—I have the honor to submit my report upon the duties performed by "E" Division since the 7th April, 1886, that being the date on which I assumed command.

Daily parades for instruction, mounted and dismounted, were at once ordered and kept up until the Division had become perfectly acquainted with the new drill, when skirmishing was practiced.

Target practice was begun shortly after my arrival, and finished while the Division was in camp. The men were put through a course of aiming and position drill previous to being sent, in squads, to the range.

The scores were not, with a few exceptions, very good. I feel confident that next year the Division will send in a much better score.

On the 15th April one Wheeler Meikle, who resides on the Elbow River, about three miles from Calgary, reported that some Cree Indians had killed one of his cows. I immediately sent a party to where the Indians were camped to enquire into the matter. The officer in charge was informed by a squaw that she had found the carcass of a cow on the bank of the river, that she had told a white man about it, and that he had given her permission to cut up the animal, which, she stated, had been drowned. Previous to this a number of animals had been drowned by falling through the ice, and, as her story appeared true, Meikle allowed the matter to drop. I warned all the Indians—who had no leave from their agent—to return to their reserves, as the settlers had complained of their being a nuisance. Inspector Primrose and Interpreter Gladstone visited all the lodges and ordered the Indians to move on the following day, which they did. As a Cree Indian named "Alexis" and his family were crossing the Elbow River one of his horses, which was harnessed to a cart, balked and acted in such a way as to cause a young man named Henry Atkinson, and others who were sitting on the bank, to laugh. This enraged the Indian, who, taking his gun from the cart, aimed and fired at Atkinson, but did not hurt him. I arrested the Indian the same evening and committed him for trial. He was subsequently sentenced to two months' imprisonment with hard labor by the stipendiary magistrate. I report this case particularly, with a view to more strenuous efforts being made by the Indian officials to keep the Indians on their respective reserves. I know that it is a very hard thing to do, and it has been only by constant watching the arrival of parties of Indians, and sending them away from the town, that a collision between them and the citizens has been avoided.

On the 25th April I received information from Langdon that a waggon load of liquor, evidently intended for Calgary, was on the prairie near that place. I sent Sergeant Fury and two men the same evening to search for the waggon, which they found the following morning. The owners must have seen our men approaching, as when Fury arrived at the waggon he found a pair of horses tied to the wheels of the waggon, and harnessed as if the owners had been preparing to start. In the waggon were five kegs containing liquor. Sergeant Fury searched the place thoroughly and found eleven other kegs, making in all sixteen five-gallon kegs, which, upon examination, were proved to contain "Bourbon" whiskey; each keg was marked St. Louis. The men made thorough search for the traders but did not succeed in arresting them. The liquor was spilled on the ground after arriving at barracks, and the other property handed over to the Collector of Customs by whom it was sold.

Early in May one Jenkins reported having lost a horse last fall, 1885, which he heard was in possession of an Indian at the Blackfoot Crossing. Interpreter Gladstone proceeded thither, but the Indian refused to give up the horse unless Jenkins paid for his keep during the winter. I advised Jenkins to pay the Indian something as he had not stolen the horse. Inspector Moodie and Gladstone went to the reserve with Jenkins and the Indian gave up the animal on receipt of \$10.00, which he would not have done—so he stated—had not a Police officer advised it.

On the 22nd May a Half-breed named Whitford brought a despatch from yourself, while *en route* to Edmonton, informing me that two prisoners named "Gallagher" and "Crackerbox" (Jones), having escaped from Edmonton, had been captured by Sergeant Gordon, from whom, after shooting him, they had escaped. As it was supposed these men would go by Blackfoot Crossing, I sent a sergeant, six men and Interpreter Gladstone to that place the same evening, with instructions to thoroughly patrol the country between here and there. I also placed men at the fords on the Bow River, sent telegrams to Indian Agent Begg at Blackfoot Crossing, the Rev. J. McDougall at Morley, and a letter to the agent at the Sarcee Reserve asking them to warn the Indians to be on the watch for the escaped, and authorizing them to tell the Indians that they would be rewarded if they assisted us in capturing "Gallagher" and "Crackerbox." I also telegraphed the officers commanding at Macleod, Lethbridge, Medicine Hat and Maple Creek. Inspector Primrose, two non-commissioned officers and nine men I sent on the Edmonton trail, with instructions to patrol on both sides of it, extending his men for that purpose. Sergeant-Major (now Inspector) Wattam with five men went to Morley. These parties were instructed to follow up the slightest clue. The party that went to the Crossing having gone down on the north side of Bow River, returned on the south side, taking two days from Gleichen to Calgary so as to patrol the country. On the 27th Inspector Primrose and four men proceeded to the "Gap" with instructions to remain a week absent and to patrol that part of the country. This party returned on the 2nd June, having discovered no trace of the fugitives. Fearing that these men might be harbored by some settler, or Half-breed, I had all places in the vicinity of the town and along the Elbow and Bow Rivers searched at different times at night, as well as in daytime, but without success. If they were concealed anywhere within a long distance of this post they must have been in the town of Calgary itself, as the outskirts of the town and the country all round was thoroughly patrolled and houses searched. In spite of rumors, circulated some time afterwards, to the effect that they were concealed in the town, I do not believe they were. About this time several horses were reported stolen, and, of course, the escaped prisoners were supposed to have stolen them. I sent men out in different directions who found the horses, they having merely strayed from their usual feeding ground. On 29th May it was reported that two men had been seen walking along the north side of Bow River in the direction of Langdon. I at once sent four men to follow them, but they saw no one. On 1st June a party of one non-commissioned officer and six men left for patrol duty to High River; this party returned on the 10th, having thoroughly patrolled that part of the district.

On 2nd June Inspecting Superintendent Herchmer left for the mountains, taking one non-commissioned officer and eight men to establish the "Mountain Detachment," and on the 5th Inspector Piercy went west to take charge. On the 9th ten more men were sent up to make this detachment twenty strong. I enclose report from Inspector Piercy as to work performed by his detachment.

In connection with the escape of Gallagher and "Crackerbox," one E. Barnett was arrested and charged with having assisted them to escape. He was brought up for preliminary examination on the 16th June and discharged.

On the 24th June the whole division, with the exception of a sufficient number who were left to protect the barracks and guard the prisoners, moved into camp on Bow River about four miles east of Calgary. On the 26th "G" Division, under the command of Superintendent Griesbach, arrived from Fort Saskatchewan and camped beside us on ground chosen by Superintendent Herchmer. While in camp

mounted and dismounted drills were kept up, and the two divisions paraded together. Rifle and revolver practice, which were commenced before going into camp, were concluded.

On the 21st July the camp and divisions were inspected by, and the latter drilled before the Right Honorable Sir John A. Macdonald, who expressed to the division, through yourself, his satisfaction at the manner in which the men had acquitted themselves on parade. The camp was broken up and the division returned to barracks on the 5th August.

These camps of instruction, particularly when two or more divisions are camped together, have a very good effect on the men, as besides bringing the men of different divisions together and being a change from barrack life, it is more healthy, and fits them for work in the field should their services be required. If allowed, I would respectfully suggest that these camps be formed every year, that they be not permanent camps, but be moved from place to place, no stated time for moving being given.

On the 14th August, I heard that two brothers named de Rainbouville had been robbed by masked men, at their camp on the Elbow River, about fifteen miles from Calgary. The robbery took place on the morning of the 5th August, and had not been reported to either Superintendent Herchmer or myself. Judge Rouleau told me I might find the de Rainbouilles at the Roman Catholic Mission, to which place I went, but they were not there. One of the Priests, Father Leduc, promised to bring Mr. de Rainbouville to barracks, which he did. I took his statement, which rather threw suspicion on one, William Mitchell. \$372.00 was the amount of money stolen. On the night of the 23rd Superintendents Herchmer and Gagnon, Inspector Moodie with a party of men, went to Mitchell's and (information on suspicion having previously been laid against them), arrested W. Mitchell, T. Behan, and a man called Patton. These men had a hearing before me, Mitchell being committed for trial, and the charges against the other two dismissed, but the parties were held as witnesses. Mitchell was subsequently tried and acquitted by the jury.

On their way to Mitchell's, and when passing the Mission, about a mile from barracks, the above party heard Indians yelling in a ravine. Inspector Moodie and two men were sent to see what was the matter. The noise came from Indians whom Inspector Moodie had told to leave town. They attacked Mr. Moodie and the men, and fired at them; Mr. Moodie and Constable Green returned the fire, whereupon the Indians retreated. It was afterwards reported that a couple of the Indians had been wounded, but the report was never confirmed, and the Indians refused to come to barracks, so we have not been able to ascertain even the names of those who were camped in the ravine.

On the above date (23rd August), at 5.30 in the evening, a man named Burns came in and reported that the stage from Edmonton had been robbed by two men at 12.45 that day. The mail bags were cut open but nothing taken from them. There were three passengers on the stage, from whom, as well as from the driver, money was taken. The robbers were both masked, one being described as having part of a Union Jack over his face. I left Barracks at 6.15 that evening for the scene of the robbery, tracked the robbers through long grass, in a coulée, for about two miles, when we could track them no longer, the grass being very short and the ground hard. Upon searching near a large rock at the place from which we could no longer track them, I found two pairs of overalls and a mask, which had been buried, no doubt by the robbers, as the mask was made from part of a Union Jack, and corresponded exactly with the description given by Burns. I divided my party (17 men), into three, and returned to Calgary as follows: Acting Sergeant-Major Richards and five men to go, in extended order, to Dog Pond and from there to the Twin Bridges, and then to Calgary on north side of Bow River. Party under myself, on each side of trail, covering a distance of about three miles. And the third party, under Corporal Shore, to the east of my party, also extended. In this order we thoroughly patrolled the country from the scene of the robbery to Calgary, for a distance on either side of the trail of about twelve miles. One of the two pairs of overalls found, were identified

as having belonged to a man named Young, who had been released from imprisonment in our Guard Room only a short time before the robbery.

On the 25th August, a report was brought in to the effect that a man known by the name of "Clinker" Scott, but whose proper name is Scott A. Krenger, had been murdered in his shanty, up the Bow River about twelve miles from Calgary, and that his body was still in the shanty. A team was sent for the body, which was brought in and placed in our hospital. A coroner's inquest was held and a verdict of "Wilful murder against some person or persons unknown" rendered. A copy of the evidence taken at the inquest was forwarded you on 7th September. I do not think there can be any doubt as to the parties who stopped the Edmonton stage, robbed the de Rainbouville brothers and murdered Scott Krenger, being the same. Probably, although not one of the gang, Krenger may have known all the circumstances connected with the above crimes, as well as the parties who committed them, and was murdered to prevent his informing, or even giving evidence against the guilty parties, should they ever be arrested. Although the most diligent search was made throughout this district, in the mountains, and telegrams sent to the different Police posts, as well as to places in the States to which the suspected parties would be likely to go, the criminals have not yet been brought to justice.

On 30th August, Inspector Moodie left for Fort Macleod, with thirty men, to do duty at that post while the transfer of "C" Division to Battleford and "D" Division to Fort Macleod were being effected. The following duties were performed by this detachment apart from fatigue and other inside work:

One non-commissioned officer, three constables, with team and buckboard, under command of Inspector Huot, to Blood Reserve with Indian annuity money. Two constables to Blackfoot Crossing, to look for two horses strayed from "C" Division. One man to Stand-off Detachment and Indian Reserve with letters. One constable with team and buckboard to Kip, to meet Superintendent Herchmer. This detachment returned to Calgary on the 17th September. Inspector Moodie closes his report to me with the following words:—

"In closing my report, I cannot speak too highly of the conduct of the non-commissioned officers and men whilst under my command. Constable Barry was most painstaking and zealous in his care of the horses. Mr. Pocklington, Indian Agent, thanked me for sending the escort, saying the men were the best he ever had placed at his disposal."

In connection with the robberies and murder cases one J. L. Benoit was engaged as a detective and appointed a special constable. He patrolled between here and the mountains and into the mountains, but was not successful in finding any trace of the men he was after.

Sergeant Spicer was sent up from Maple Creek for the same purpose, and Sergeant McDonnell also did duty as a detective. Both these non-commissioned officers worked hard and well, and although they traced different parties who were supposed to be the men they wanted, they always found they were wrong.

The men employed by, and working on the line of the Canadian Pacific Railway promised to assist us in the capture of the criminals, and I have no doubt did all they could, but up to now we have not been able to obtain the least information as to their whereabouts. If the same men committed the three crimes they have sufficient money to live on for some time, and may still be concealed in the mountains.

Constable Scholes of "H" Division also did duty as a detective in the mountains but was not more successful than the others.

The Canadian Pacific Railway officials at Langdon reported, on different occasions, that Indians, passing between the Blackfoot Crossing and Calgary, were in the habit of helping themselves to wood and water, much to their annoyance, particularly in the matter of water they having to depend upon passing trains for their supply, and requested me on the 18th of September to send a couple of men to remain at Langdon until the Indians had come to Calgary to spend their annuity money had all

passed on their way back to the reserve. I complied with their request by sending Constables Green and Lanridge who remained there until the 24th.

On the 12th of October Inspector Moodie proceeded to Scarlett's, to arrange for a detachment of two men being stationed there. This detachment consisting of two constables was started and has been maintained ever since, the men being changed periodically. The instructions given this detachment are to patrol in the vicinity, and to escort the Edmonton mail a distance of ten or twelve miles north and south. These duties have been regularly performed.

On Sunday, 24th of October, J. Carney came to the barracks and reported that a squaw had been killed by an Indian on the east side of the Elbow. Two parties, one under Inspector Moodie, and the other under Sergeant Wilde, were sent to find out if there was any truth in the report, and if so, to bring in the body and arrest the Indian. The woman said to have been killed was found; she stated that her husband had beaten her with a stick, but that she did not wish to have him arrested, and positively refused to lay a complaint against him.

On the morning of the 6th November, at about six o'clock the assembly was sounded, a large fire having been seen in town. The Division turned out and doubled to the scene of fire, which had started behind a large provision store kept by S. Parrish & Son. After very hard work the fire was got under control, but not before several buildings, principally stores and saloons, had been destroyed, with almost all they contained. The behavior of the men of "E" Division, and the way they worked, was remarked on all sides, it being freely and openly stated that had it not been for the presence of the police, and the systematic way they worked, much valuable property in the shape of goods saved from the burning, might, and no doubt would have been stolen; and a great many more buildings if not the whole town, would have been burned. While some men worked at the burning houses others were placed on guard over property saved, and all worked well, showing good discipline and organization, in the quick, quiet, and systematic manner in which they obeyed all orders given them.

The town council at its first meeting after the fire, passed a vote of thanks to the police, a copy of which was sent to the officer commanding at this post who forwarded it on to you. The town was placed under the control of the police during that day and night, when men were placed on duty to protect property and see that the fire did not break out afresh.

It having been reported by General Strange, manager of the Military Colonization Rancho Company, that some of his cattle had been killed, and that he suspected a Blackfoot Indian named "Lake Raiser," I sent Corporal Swinton and Interpreter Gladstone to enquire into the report and to arrest the Indian, whom they could not find, he having evidently been warned by friends of the approach of the police. On the 15th November, General Strange and J. Scott, the Indian Farm Instructor, informed us that "Lake Raiser" was camped on "Old Sun's" Reserve. Sergeant McDonnell, Interpreter Gladstone and three constables were sent by train to Gleichen with instructions to remain there until dark when they would be met by Indian Agent Begg, and an Indian named "Wolf Head" who had agreed to point out "Lake Raiser's" lodge to our men if they came at night. Having met "Wolf Head" the party proceeded to the reserve and succeeded in arresting "Lake Raiser," but not without some difficulty, as other Indians and squaws got around the prisoner, and in every way did their utmost to prevent his being taken. Had it been even suspected that our men were near the reserve "Lake Raiser" would undoubtedly have cleared out and would not have been arrested for some time hence. Since his arrest he has been sick, consequently his preliminary trial has been postponed. Sergeant McDonnell and his men deserve credit for the manner in which they made this arrest, as besides getting to the reserve without being seen or suspected by Indians, their discretion in not resorting to violence while arresting, and the friends of the prisoners doing all in their power to make it hard for them, is very commendable.

On 15th November a detachment of one non-commissioned officer and three con-

stables proceeded to Stimson's ranche, about forty miles from here, to be stationed at that place. This detachment will constantly patrol that section of the country, sending one man every Monday to Mosquito Creek (half way between Calgary and Fort Macleod) to meet a man from "H" Division; and another, on same day, to Barter's ranche, to meet man from Calgary. By this system we can have weekly reports as to what goes on between here and Fort Macleod.

On the 26th November W. P. Walsh was committed to our guard-room by G. C. King, J. P., for lunacy, to await the pleasure of His Honor the Lieutenant Governor.

Lafayette French was brought from Banff by Constable Skinner, to give information as to the death of a squaw near Shagganappi Point, about three miles from barracks. French reports that in passing near some lodges on the evening of the 23rd November, he saw what appeared to him to be a body being carried out of a lodge. After walking a short distance he turned around and saw two figures on the top of a small hill, one standing and the other apparently kneeling. As it was after dusk he would not be positive as to last statement. The figure that appeared to be kneeling suddenly disappeared. Feeling certain that a murder had been committed he came to town and informed the chief of the town police; he then went to Banff where he repeated the above story, and he was sent down by Constable Skinner. I saw Chief of Police Ingram at once, and he told me that French had made the statement to him but that he did not believe him, and never gave the matter a thought since. I sent Inspector Moodie and Interpreter Gladstone to the place, and they were there told by an Indian that there had been a sick woman in a lodge at the Point; that the woman had died and the lodge had been moved to another place. French was brought down on the 29th and the above information obtained on the same day. I will have the body taken up and examined by Dr. Henderson to ascertain if it bears any marks of violence, and, if it does, I will hunt up the parties who were camped at Shagganappi Point on the date mentioned by French, and will arrest them on suspicion of murder.*

The money for the annuity payments to Indians at Edmonton, and in that District, was sent to Red Deer River with an escort of "G" Division men under command of Inspector Moodie, at which place he handed it over to Inspector Chalmers, who took it on to Edmonton. The money for Blackfoot Crossing was taken to that place by Superintendent Herchmer with an escort of two men, who assisted the Indian Agent in making the payments. The money for the Stoney and Sarcee Reserves was by me handed over to the Indian Agent de Balinhard.

Breaches of the liquor law have, I regret to say, increased during the past year, notwithstanding the heavy fines imposed and the great quantity of liquor that has been destroyed. This increase is attributable to the fact that now liquor can be brought into the Territories from the West as well as from the east and south, whereas formerly it was brought in from only the two last named directions.

We have now in "E" Division a band numbering seventeen men with instruments for playing either mounted or dismounted. These instruments which cost nearly six hundred dollars are all paid for, every member of the Division contributing so many days' pay until the required amount was collected. The men play very well and every member of the Division takes an interest in the band. I would respectfully request, on behalf of the Division, that a yearly grant of \$100 be allowed by the Government towards the running expenses, new music being constantly required, and it would be well to have a few music stands for use when playing dismounted. A very good folding stand would cost about \$4.

NOTE.—Since writing the above an external and internal examination was made by Dr. Henderson who reports that the woman died from a disease she had been suffering from, and not from foul play.

W. D. A.

STATEMENT of Parties leaving N.-W. M. P. Post at Calgary on duty from 7th April to 30th November, 1886.

(Not mentioned in General Report.)

Date.	Number of			Remarks.
	Officers.	N. O. O.	Men.	
April 13...	1	1	1	Supt. Herchmer to Fort Macleod.
do 13...	1	.....	To Fish Creek for horse reported stolen; returned same day with horse which was handed to owner; party from whom taken stated he had purchased the horse from an Indian for \$30.
do 15...	1	.....	1	To warn Indians up Elbow to return to Reserves.
do 16...	1	6	To arrest Indian who shot at H. Atkinson.
do 20...	2	To Gleichen to look for liquor.
do 22...	20	Ten on each side Bow River looking for body of drowned civilian.
do 23...	2	To High River to arrest Tucker on liquor case.
do 27...	1	.....	.....	To Canmore.
do 28...	1	2	To Langdon after liquor; captured 80 gallons.
do 29...	1	To serve summons 20 miles up the Elbow River.
May 3...	6	Left for Regina with horses by train.
do 4...	2	To get horse from Indian at Crossing; horse lost a year ago.
do 4...	1	.....	.....	To Cochrane Rancho to notify re bringing horses for sale.
do 10...	1	.....	1	To Crossing for Jenkins' horse; paid Indian \$10 for keep.
do 11...	2	To Sheep Creek to arrest Fraser; liquor case.
do 12...	1	.....	To Laggan on duty and to remain there.
do 15...	4	Teamsters with 4 waggons, transport "G" Division men to Mosquito Creek.
do 21...	3	.....	2	Commissioner, Surgeon Jukes and Supt. Herchmer to Edmonton.
do 26...	1	.....	Veterinary Sergeant Burnett to Regina.
do 27...	1	1	3	Patrol duty at "The Gap."
do 28...	1	2	20 miles up the Elbow to look for still; none found.
do 29...	3	To search shacks down Bow River at night.
June 1...	1	6	Patrol duty on High River.
do 2...	3	6	To search shacks up the Elbow River; 3 parties, at night.
do 5...	1	3	Patrol duty at Gleichen.
do 7...	1	4	Search in and around town for liquor.
do 9...	1	.....	10	Inspector Antrobus to return; men to strengthen Mountain Detachment.
do 10...	1	.....	With note to Scarlett's re Burnett's arrest.
do 11...	3	To search half-breed camp for liquor on Bow River.
do 12...	2	With load of oats to Red Deer; oats borrowed by "G" Division men.
do 13...	1	To Strange's Rancho.
do 19...	3	To watch for liquor being brought in; none found.
do 24...	1	2	Patrol, Pine Creek, expected to find 2 "G" Division horses.
do 29...	2	Patrol, High River.
July 5...	1	To Blackfoot Crossing to caution Indians re stealing wood.
do 10...	1	With prisoner from Banff
do 19...	1	.....	11	To Gleichen, escort duty.
do 28...	1	To Regina in charge of car load of horses.
do 30...	1	To Sarcee Reserve re liquor cases, for evidence.
do 30...	1	.....	To Banff re liquor case against J. Barr.
Aug. 13...	2	Patrol duty to Sheep Creek.
do 14...	1	2	To Cochrane to search for illicit still; found still.
do 14...	1	.....	.....	Supt. Antrobus to Gleichen to arrange for freight to Battleford.
do 16...	2	To Mosquito Creek to meet Col. Ravenhill.
do 18...	2	To arrest Bailey for assault, 4 miles south.
do 20...	1	To Cochrane to search for liquor.
do 29...	1	1	Patrol towards Morley.
Sept. 2...	2	Patrol duty, High River.
do 6...	2	Duty at Blackfoot Crossing during Indian payment.
do 9...	2	To Scarlett's to escort Edmonton stage.
do 10...	1	.....	To Cluny with letter from Commissioner to Supt. Steele.
do 11...	1	2	Patrol duty up Elbow and in Foot Hills.
do 20...	1	4	Patrol duty at Ghost River.
do 23...	1	.....	.....	With "G" Division men and Indian money to Red Deer.
do 27...	2	To Lethbridge with prisoner, L. Patton.
do 27...	1	To Gleichen for witness.

STATEMENT of Parties leaving N.-W. M. P. Post at Calgary, &c.—*Concluded.*

Date.	Number of			Remarks.
	Officers.	N. O. O.	Men.	
Sept. 27...	1	6		Patrol duty, vicinity of Battleford Crossing.
do 29...	1			To Stimson's Rancho with letter <i>re</i> Laifferty.
do 30...	2			On Morley trail.
Oct. 4...	1	3		Patrol duty, vicinity High River, Bartera, Pine Creek.
do 1...	1			To Canmore to serve summons.
do 11...	2			To look for cache, north side Bow River.
do 15...	1			To Gleichen to enquire for L. Cornell on warrant from Macleod.
do 22...	2			To Langdon to arrest J. Little.
do 24...	2			To Sheep Creek to bring in sick horse left by Supt. Herchmer.
do 27...	1			Inspector Moodie to Banff to try liquor case; prisoner sick.
do 28...	1	1		To Nose Creek to look for Kickawasis, wanted at Battleford.
Nov. 12...	1	2		To Regina with horses.
do 16...	1	1		With horses to be left at Kerfoot's Rancho on herd.
do 22...	2			With supply of oats for Stimson Detachment.
do 23...	2			To Radnor with search warrant; no stolen goods found.
do 25...	2			5 miles up elbow to arrest Davis; liquor.
do 29...	1			To Barter's to meet man from Stimson's Detachment.
do 30...	1	3		To Cochrane to seize liquor (500 gallons) reported as coming on C.P.R. to that place; none found.

During the year the following improvements were made at this post:—

A wind mill pump was put in the square, but so far no tank has been contracted for. I would respectfully recommend that one be built as soon as possible.

The building lately occupied as a Quartermaster store has been turned into a stable. The work being done by our own men.

A new building for Quartermaster store was put up also by our own men. This is a very substantial building and well laid out for the purpose for which it is intended.

An addition was put to the quarters occupied by Superintendent Herchmer.

A waggon shed was also built; size 20 by 24. This shed is very small and is used for waggons lately purchased.

In closing this report it affords me very great pleasure to acknowledge the cheerful and able assistance I have at all times received from the officers, non-commissioned officers and constables under my command.

I have the honor to be Sir,

Your obedient servant,

W. D. ANTROBUS,

Superintendent, Commanding "E Division."

The Commissioner
North-West Mounted Police,
Regina.

APPENDIX L.

ANNUAL REPORT OF INSPECTOR HOWE.

BATTLEFORD, 1st December, 1886.

SIR,—I have the honor to place in your hands this my annual report of "K" Division, N. W. M. P., for the twelve months terminating on the 30th November, 1886.

I regret that this report must necessarily be of a meagre nature, inasmuch as "K" Division was for some time, in the earlier period of its existence, without officers or non-commissioned officers of its own, it necessarily fell under the guidance of officers and non-commissioned officers of "D" Division. No records, save those of "D" Division, were kept of the work performed, and by the removal of that Division to Macleod during the latter part of the year, these records are removed from my reach.

"K" Division, under the command of Assistant Commissioner Crozier, arrived at Battleford on the 20th October, 1885, the other officers attached to the Division being Inspectors Allan, Wood and Wilson, the strength of the Division, at the time, being 89 men and 48 horses.

There being no quarters for the men, the Division was broken up; some of the men were quartered in the large barrack room outside the stockade, some in the Sergeant's Mess room and kitchen and the remainder in a building known as the Otten House which was rented for that purpose.

On the 24th October, 1885, Inspector Wood took over command of the Division.

During the month a party consisting of one Staff Sergeant and eighteen constables were transferred from "K" to "F" Division at Prince Albert, by order of the Assistant Commissioner, their places in "K" Division being taken by nineteen men from "F" Division.

About this time another interchange of men was made between "K" and "D" Divisions. These changes were made in order that a fair proportion of trained men should be in the ranks of the division, it having on its departure from Regina been made up principally of recruits.

With the same intention, there being no non-commissioned officers posted to the division, the Assistant Commissioner filled up the greater part of the non-commissioned rank by promoting corporals of "D" Division to be sergeants in "K" and constables of "D" to be corporals in "K." Sergeant Martin of "D" being attached to "K" as Acting Sergeant-Major.

On the 24th of December Superintendent A. R. Macdonell having arrived from Regina took over the command of the division from Inspector Wood, who returned to duty with his own division, viz, "D."

DRILL.

A regular course of drill was gone through at this post during the year, both mounted and on foot.

Special attention was given to the musketry instruction, each man having fired at the various ranges in accordance with the orders on the subject issued from Headquarters.

GUN DRILL, 9-PR. M.L.R. AND 7-PR. M. G.

I drilled and instructed two non-commissioned officers and fourteen men of the division thoroughly in gun drill, both with the 9 pr. M.L.R. and the 7 pr. mountain gun, and explained to them the use of the various projectiles, etc., etc.

ARMS.

The arms of the Division are in very good order.

There are still 18 of the old pattern (Adams) revolvers in the Division, and it would be advisable if possible to have them returned to headquarters, receiving the Enfield in place of them.

SADDLERY.

The saddlery of the Division is in good condition, the new double-cincha saddles give satisfaction.

Whitman bits are much required, there being at present only (20) of them in possession of the Division.

The Pelham bit does not seem so suitable for police purposes as the Whitman.

Saddler's tools are urgently required.

There are at present on the Division books 62 numnahs, but of these 15 are in bad order and should be replaced; saddle blankets have just been issued to the Division it being found that the numnah was not a sufficient protection for the horses' backs when employed on trips.

CLOTHING.

On account of the want of clothing in the Quartermaster's store here; it has been impossible to complete the annual issues to the men when due.

Stores are now constantly arriving and the men's kits are being made complete as fast as possible.

HORSES.

Owing to the amount of work performed by the Division in escorting the mails, making trips around the reserves, &c., they were for some time very poor in condition.

They have, however, picked up greatly during the last two months, and with the exception of a few which I would suggest should be cast and sold, they are fit for service.

OUTBREAK OF FEVER.

This summer and fall "K" Division along with "D" has suffered from a severe outbreak of typho-malarial fever.

At one time about the end of August there were between 30 and 40 men on the sick list, which circumstance, with the men employed on escort duty, &c., and those necessarily employed on the Staff, left only a very few men available for duty.

Three men of the Division died at this post from fever, viz: Regimental No. 763, Constable Rummerfield, Regimental No. 1,186, Sturge, and Regimental No. 1,279, Mason, and on the 7th July, Constable W. E. Cowan, was accidentally drowned, this making four deaths in the Division during the year.

DESERTIONS.

Few desertions have taken place from "K" Division.

On the 6th day of May, Regimental No. 1,215, Constable Comber, deserted and although parties were despatched in pursuit and every endeavor made to capture him he succeeded in evading them.

On the 10th July, Regimental No. 1,538, Constable E. Dubois, deserted during the night.

This man was taken at Swift Current by Sergeant McGinnis, of "A" Division to whom notice of the desertion had been sent. Dubois is now at Regina undergoing imprisonment.

DUTY OUTSIDE THE POST.

A very large share of the outside duty of the post has been performed by "K" Division. In January a regular system of patrols to visit all the reserves in this district was established. Parties consisting of usually one non-commissioned officer and six men left the post every week and made a trip around all the Indian reserves in the neighborhood.

The distance travelled on each trip averaged about 140 miles, and usually took eight or ten days. "K" Division also furnished a party under an officer for the purpose of escorting the mail between this place and Swift Current.

This detachment under Inspector Wilson went out to the mail station at Bush Lake on the 29th July last; and since that time up to the beginning of last month performed all the escort duty.

I relieved Inspector Wilson in the beginning of September. The detachment was withdrawn on the 20th October, other arrangements being made for the winter months.

The transport of "K" Division accompanied "D" Division, which left this post for Fort Macleod on 1st September last; going as far as the Red Deer River, with that Division and returned thence with "C" Division, Superintendent Cotton; arriving here on the 17th September. Various trips to Sounding Lake, Fort Pitt, Swift Current, &c., &c., have also been performed by "K" Division, which has borne a very great part of the police work done in this district.

TRANSPORT.

The Division has in its possession thirteen heavy waggons, which with two spring waggons and four buckboards comprise all the transport.

This, however, is in good order, with the exception of two of the buckboards; one of these I shall have to condemn as unfit for further use; the other can be repaired by our own artisans.

With the exception of one heavy waggon at Onion Lake all transport of the Division is now at this post.

HARNESS.

There are in possession of the Division:—

7 sets wheel harness.

4 do lead do

3 do single do

I would request that eight more sets of wheel harness might be supplied so that we might be able to use all our transport if required.

CARBINE SLINGS.

Carbine slings for the saddles are urgently required.

I would suggest that the sling should be made with buckle and strap.

LANYARDS.

Lanyards for the revolvers have been made and issued to each man in the Division in accordance with General Orders.

CRIME.

There has been very little crime in the Division during the past year.

I regret to say that one constable of "K" Division, Regimental No. 825, Constable McGinnis, is at present a prisoner awaiting trial at the next sitting of the court here.

DISCIPLINE.

Several slight breaches of discipline have occurred, but the general behavior of the men, the manner in which they performed their duty, their appearance and smartness both on and off parade, and the small amount of crime, I think, show that a high state of discipline has been maintained, notwithstanding the Division having of necessity been so much broken up during the year, and the many and frequent changes among the non-commissioned officers.

FATIGUE.

In consequence of the repairs recently made here, both to the men's quarters and stables there has been an immense amount of fatigue duty to be done, which, has had the effect of leaving few opportunities for parades.

DETACHMENTS.

The only permanent detachment at present furnished by "K" Division consists of one non-commissioned officer and three constables with three horses at Bresaylor and three constable and four horses at Onion Lake, and two men and two horses at the Sixty Mile Bush, Swift Current Trail.

INDIAN MATTERS.

At various times during the year reports of the alleged unsettled state of the Indians in this district have been rife, but enquiry has, in every case but one, proved their falsity.

This one exception was not of a very serious nature. On the 10th September Indian Agent MacKay reported that a band numbering about sixty Indians had deserted from Poundmaker's reserve.

Inspector Bégin, of "F" Division, was instructed by Superintendent MacDonell to follow these Indians and if possible induce them to return to their reserve.

Inspector Bégin returned in a few days, having been successful in finding a portion of the band and bringing them back to their reserve.

I have the honor to be, Sir,

Your obedient servant,

JOSEPH HOWE,
Inspector.

To the Commissioner,
North-West Mounted Police,
Regina.

APPENDIX M.

NORTH WEST MOUNTED POLICE—General Distribution State of Men and Horses.

Division.	Place.	Commissioner.	Superintendent and Adjutant.	Senior Surgeon.	Quartermaster.	Superintendent.	Inspector.	Assistant Surgeon.	Veterinary Surgeon.	Staff Sergeants.	Sergeants.	Corporals.	Constables.	Total.	Grand Total, Men.	Horses.	Total Division.
Depot...	Regina.....	1	1	1	1	1	8	1	1	10	7	4	133	169	.....	85	
	Whitewood											1	1	2	.....	1	
	Fort Qu' Appelle											1	2	3	.....	6	
	Moose Jaw											1	1	2	.....	2	
	Town Station											1	1	2	.....	
	Moosomin												1	1	.....	1	
	Manitoba and North-Western Rail- way, Wolverine, Man												4	4	.....	2	
															183		97
" A " ...	Maple Creek					1	1			3	4	7	58	74	.....	55	
	Medicine Hat.....						1				1	2	13	17	.....	31	
	Swift Current.....										1		3	4	.....	4	
	East End Post.....											1	3	4	.....	
	Regina.....												1	1	.....	
															100		90
" B " ...	Regina.....					1	2			2	1	6	46	58	.....	93	
	Broadview											1	1	2	.....	
	Fort Qu' Appelle												1	1	.....	
	Qu' Appelle Station										1		2	3	.....	
	Moose Mountain										1		7	8	.....	10	
	Moosomin											1	1	2	.....	
	Town Station												1	1	.....	
	Wood Mountain										1		5	6	.....	5	
	Willow Bunch												2	2	.....	2	
															84		110
" C " ...	Battleford.....					1	3	1		4	4	7	51	71	.....	80	
	Onion Lake										1		5	6	.....	6	
	Bresaylor												3	3	.....	4	
	60-Mile Bush												2	2	.....	1	
															82		91
" D " ...	Fort Macleod.....						1			3	4	4	59	71	.....	54	
	Lethbridge.....					1	1			1	1	2	26	32	.....	22	
	Battleford.....							1						1	.....	
	Absent with leave.													1	.....	1	
															105		76
" E " ...	Calgary.....					2	2			3	6	5	81	99	.....	74	
	Regina.....											1		1	.....	
	Stinson's										1		3	4	.....	5	
	Banff												2	2	.....	2	
	Scarlett's												2	2	.....	2	
															108		83
" F " ...	Prince Albert					1	1			4	2	4	51	63	.....	53	
	Batoche						1				1	1	12	15	.....	12	
	Touchwood											1	1	2	.....	4	
	Howse's.....												2	2	.....	
	Humboldt.....												2	2	.....	1	
															84		70
" G " ...	Fort Saskatchewan.....									4	3	3	31	41	.....	41	
	Edmonton.....						1				1	1	17	20	.....	20	
	Red Deer.....					1	1	1		1		1	13	18	.....	11	
															79		72

APPENDIX M.—North-West Mounted Police—General Distribution State of Men and Horses—Concluded.

Division.	Place.	Commissioner.	Superintendent and Adjutant.	Senior Surgeon.	Quartermaster.	Superintendent.	Inspector.	Assistant Surgeon.	Veterinary Surgeon.	Staff Sergeants.	Sergeants.	Corporals.	Constables.	Total.	Grand Total, Men.	Horses.	Total Division.
"H"....	Pincher Creek.....	1	7	8	6	95
	Stand Off .....	...	...	...	...	...	...	...	...	...	...	...	4	4	.....	3
	St. Mary's .....	...	...	...	...	...	...	...	...	1	...	...	4	5	.....	4
	Piegan Reserve .....	...	...	...	...	...	...	...	...	...	...	...	4	4	.....	3
	Kootenai .....	...	...	...	...	...	...	...	...	...	1	...	3	4	.....	4
	Leavings, Willow Creek.....	...	...	...	...	...	...	...	...	...	...	...	3	3	.....	6
	Kipp .....	...	...	...	...	...	...	...	...	...	...	...	1	1	.....	4
	Regina .....	...	...	...	...	...	...	...	...	...	...	...	1	1	.....	...
	On Command .....	...	...	...	...	...	1	...	...	...	...	1	3	5	.....	...
	Lethbridge .....	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	...
	Fort Macleod.....	...	...	...	...	1	2	...	3	5	...	2	49	62	97	65
"K"....	Battleford.....	3	...	1	3	...	6	56	69	55	61
	Union Lake .....	...	...	...	...	...	...	...	...	...	...	...	3	3	.....	4
	Settlement .....	...	...	...	...	...	...	...	1	...	...	...	3	4	.....	2
	Mail Duty .....	...	...	...	...	...	...	...	...	...	...	...	2	2	.....	...
	Fort Macleod .....	...	...	...	...	...	...	1	...	...	...	...	...	1	.....	...
	Regina.....	...	...	...	...	...	...	...	...	1	...	...	1	1	.....	...
	On leave.....	...	...	...	...	1	...	...	1	...	...	...	1	3	.....	...
		1	1	1	1	11	28	5	1	41	52	67	796	1005	845

APPENDIX N.

ANNUAL REPORT OF SENIOR SURGEON JUKES.

REGINA, N.W.T., 16th December, 1886.

SIR,—I have the honor to place in your hands to-day my annual report as senior surgeon of the North-West Mounted Police for the twelve months terminating with 30th November, 1886.

During much of the period which has elapsed since my last annual report was forwarded I have been absent from headquarters, engaged in various duties devolving upon me as senior surgeon.

Leaving Regina on the 5th of December, 1885, in obedience to instructions received, I proceeded to Ottawa to prepare from the various requisitions already forwarded, the revised estimates for the annual supply of medical stores for the service of this force, which, during the year 1885, had been rapidly increased from 500 to 1,000 men. Having performed this and other incidental duties required of me in Ottawa, where much other matter, including the examination by the Medical Board of various discharged men, who made claims for compensation on various grounds demanded consideration, the medical estimates were placed in the hands of the contractors, Messrs. Kenneth Campbell, & Co., of Montreal, to which place I next proceeded, in order to superintend the selection of special medical stores, including hospital furniture and appliances, which required personal supervision. These duties having at length been accomplished to the best of my ability, I proceeded to Toronto to examine and select from among many applicants three additional men, members by examination of the Ontario Pharmaceutical College, who were required to fill vacancies in the newly created divisions of the enlarged force as hospital staff sergeants.

Having completed the various duties above referred to, a short leave was kindly granted, to enable me to visit members of my family in Ontario; after which, namely, on the 14th of April, 1886, I left Toronto by the Canadian Pacific Railway, arriving at my destination, headquarters, Regina, five days later.

Owing to the continued severity of the weather during the first weeks of April, 1886, it was not considered prudent to risk the safety of so large and valuable a consignment of medical stores by forwarding them as early in the spring as was otherwise desirable; but on the 18th and 19th of April they were shipped *via* Canadian Pacific Railway from Montreal, those directed to Regina reaching their destination safely and in excellent condition on the 10th of May, and at more distant posts as soon after that date as the means of transport available to each rendered their safe delivery possible.

On the 18th of May I left Regina in company with the Commissioner for the western posts, on my annual tour of inspection, between which date and June the 16th, I visited and inspected the hospitals and the sanitary condition of the force generally, at Calgary, Edmonton, Fort Saskatchewan, Macleod, Lethbridge and Maple Creek, examining at various posts and forwarding to headquarters to be invalided, some few members of the force who were rendered unfit for service by chronic affections of long standing.

I reached Calgary by Canadian Pacific Railway on the 19th of May, but the post though then to a certain extent examined was not thoroughly inspected by me until after my return from the north, a fortnight later. To this I now turned my face, proceeding by a light waggon 194 miles, nearly due north over an elevated rolling country, much of which is of great natural beauty and fertility, abundantly watered,

in some places fairly supplied with timber, to the old Hudson Bay Fort at Edmonton, on the North Saskatchewan, which long constituted our most north-westerly post, but at which a very small detachment was now stationed (the old "Fort" being in a more or less ruinous and unhealthy condition), and thence down the river, which at this point flows in broad and rapid flood to the north-eastward, twenty miles further down stream to Fort Saskatchewan, the present headquarter post of "G" Division.

The hospital accommodation at Fort Saskatchewan is extremely limited, and whether this post is continued permanently at its present site, or is removed to a more convenient location, a new hospital containing room for not less than ten patients, with quarters for hospital staff-sergeant and a competent dispensary should be provided as soon as possible, as the one inspected by me was altogether insufficient for the force stationed there. Fortunately the health of the men was remarkably good; but hospital accommodation to the extent mentioned, should, in all cases, be furnished for every division of 100 men wherever they are permanently stationed, as circumstances might at any time arise when the want of adequate provisions for the sick would be severely felt.

The site of the present post, upon the elevated plateau to the south-east of the North Saskatchewan valley, probably several hundred feet above the river, with a considerable growth of small timber and dense copsewood clothing the steep incline to its summit, and the plateau above it to within 120 yards of the stockade, to which distance it was cleared away during the Riel rebellion, appears to be a highly salubrious one, the conditions here referred to proving largely instrumental in producing this result; a far narrower belt of timber or copsewood than is here found interposed between the post and the deep valley which lies below it, having been often found sufficient to ward off by influences, which, though long recognized, are still scientifically inexplicable, the deleterious effects of malaria, which at certain seasons, and under conditions favorable to its development, unquestionably infests to a greater or less extent the deep valley through which the river flows.

An examination of the sick reports confirm in a striking manner the observations here made and the well known though hitherto unexplained fact above referred to, only one case of mild intermittent fever of a few days' duration having occurred at this post during July, August, September and October of 1886, the months during which in these latitudes malarial fever more especially prevails. The very strong and rapid current of the "Swift-running Water" (which the Indian name "Sas-ka-wun" literally signifies) for several miles both above and below Fort Saskatchewan exercises also a healthy influence, even where malaria is largely generated in its neighborhood, as has long been noticed by observers.

The old log hospital at Calgary, long since condemned, is still the only one available at that post, which also, during the past season, has enjoyed a remarkable immunity from malarial fever; the rapid current of the Bow and Elbow Rivers, which here coalesce, and the comparatively restricted channels in which they flow exercising a favorable influence in this direction, but the growing importance of the town of Calgary, in immediate proximity to the post, and the great number of visitors arriving there during the summer months from every part of the Dominion and beyond it by the Canadian Pacific Railway, may at any time be the means of introducing contagious zymotic diseases, from which under such circumstances the garrison could hardly be expected to escape, and another summer should not be permitted to pass until a competent hospital containing from twelve to fifteen beds, with all necessary appointments, is completed. I cannot too strongly urge the adoption of this recommendation at an early day; the more so because under quite possible conditions dependent upon heavy rainfalls during the summer and autumn months' alternating with periods of high temperature and cloudless skies, Calgary and its neighborhood, under opposite conditions to those recently obtaining at Battleford, and in a less degree at Macleod, might suffer from a similar visitation of malarial fever.

The hospital at MacLeod, which was next visited and inspected, is the best

hitherto provided at any post in the North-West Territories, affording ample accommodation for one division, *i.e.* for a force of one hundred men. In the report of Assistant Surgeon Kennedy, herewith forwarded, no reference is made to the abundance and excellence of the medical supplies and hospital comforts provided; this may I think be regarded as conclusive evidence that nothing material is required to promote the efficiency of the service or the comfort of the sick, was wanting at this post, and the inspection made by me was upon this point equally satisfactory. The "fever" lately prevailing at this post and throughout the North-West Territories generally, to which allusion has been made by Assistant Surgeon Kennedy, demands special consideration and will be referred to later on in this report.

If a new post is to be erected at Lethbridge for one division of the force, competent hospital accommodation should be provided as early as possible in the spring of 1887. During the greater part of the year now expiring, the headquarters of "H" Division was under canvas here, but a considerable number of the men were engaged during the summer and autumn months in patrolling the country lying between Lethbridge and the international boundary. For the present the greater part of this Division has gone into winter quarters at Fort Macleod. In the course of my western tour I inspected the condition of those encamped at Lethbridge, furnished them with a hospital marquee and suggested such other temporary hospital accommodation as seemed necessary. The outpost has since from time to time been provided with the requisite medical stores, but the high winds uniformly prevailing throughout this section of country, which is bare and devoid of shelter, renders anything less substantial than a wooden building unfit for hospital purposes, and if the headquarters of one Division is to be permanently established here, sufficient hospital accommodation both for the reception of the sick and the preservation of hospital stores, should be promptly arranged for; a healthy location for the post can no doubt be found, and this should be selected by some one familiar with the laws by which the generation and distribution of malaria, the prolific source of endemic fevers so common throughout extensive regions of this and other continents, is universally governed.

Proceeding eastward from Lethbridge, the next and last post inspected by me during this journey, was Maple Creek.

The supply of medical stores and appliances at this post was found to be abundant and in admirable order, notwithstanding the limited and wholly insufficient accommodation afforded by the present hospital building. The barracks at this post are very good; the hospital, a very small one, badly constructed and ill-arranged for the purposes required of it, is altogether inadequate under quite possible circumstances for the garrison ordinarily stationed there, and should be either enlarged, repaired and re-arranged without delay, or an entirely new and sufficient one should be constructed. A better site also might be selected than the one it now occupies.

Only one case of malarial fever, and that a very mild one of ordinary "intermittent," has occurred at Maple Creek post during 1886, but this fact is less due to its situation than to a concurrence of circumstances which have tended during the past season to maintain its salubrity. The situation is a favorable one near the foot of the northern slope of the Cypress Hills, the soil to a considerably depth is naturally sandy and dry, and the rainfall during the spring, summer and autumn months having been phenomenally light, although the heat has been intense, one of the essential elements required for the generation of malaria, namely moisture, has been lacking and consequently malaria has been but slightly and imperfectly eliminated. But during a season alternately wet and hot, such as may not unfrequently occur, this now healthful post would in all probability be visited by endemic malaria fever; while under precisely similar conditions, the vast marshy flats and river bottoms, like those of the great Saskatchewan in the neighborhood of Battleford, now parched and dry, would enjoy comparative immunity from malaria influences, because they would then for the most part be covered with water. That cases of this fever have occurred to some extent in the village of Maple Creek, three miles to the northward of the post, is due to the fact that it occupies considerably lower grounds; the soil is one more tenacious of moisture and the descent being continuous though

moderate from the post to the railway station where the village lies, a greater degree of moisture was present there to be exhaled by the sun's rays.

It may and probably will happen in succeeding years when I and my words are forgotten, that altered atmospheric conditions such as those referred to will be found to have relatively altered the focus of malaria fever throughout this country; the high and dry situations being then subjected to its influence, while the ordinary marshy district and low river bottoms, in which it has recently so extensively prevailed, will enjoy for the reason above referred to, at least a temporary immunity. Had endemic fever prevailed during last autumn at Maple Creek, the present hospital would have proved altogether unequal to the requirements.

The supply of wholesome water at this post was also examined by me, as one demanding prompt attention, that at present available being of a highly alkaline and deleterious character. If Staff Sergeant Holme is right in his assertion, that an abundant supply of good and wholesome water can be obtained at a depth of from 16 to 20 feet on the opposite side of the creek, instructions shall be given that wells may be sunk there as far as practicable if none nearer is attainable, the one intended for the supply of the garrison being strictly retained for that purpose alone and carefully isolated from that in the neighborhood of which the horses are daily watered.

A very severe injury was sustained by Sergeant Smart a few days before my arrival at Maple Creek, both bones of the leg being fractured at the ankle joint. A special apparatus was made for him under my immediate superintendence and applied to the limb. A month later, when able to travel, he came down to Regina, the recovery of the injured limb was perfect. After completing my inspection of the various posts above referred to I returned to Regina on the 16th of June, after an absence of twenty-nine days.

Having received a telegram from Maple Creek that Sergeant Paterson, of "A" Division, had sustained a dangerous bullet wound by the accidental discharge of his pistol, requiring my immediate attendance, I left Regina by the 24 o'clock train on the 12th of July for that post. I found on my arrival that the severity of the injury had not, and could hardly have been, exaggerated. At the time of its occurrence, Sergeant Paterson was practicing firing from the saddle with a new horse unaccustomed to the discharge of fire-arms, which plunged so violently at the explosion that Sergeant Paterson threw his right hand, which held the pistol, rapidly forward and across his body to seize the horn of the saddle, in grasping which, the weapon, a self-cocking Deane & Adams 45 calibre revolver, throwing a heavy projectile, was fired by the pressure of the hand, the ball striking the left thigh close to the groin and shattering the thigh bone high up in its upper third. Gunshot fractures of this nature are attended with extreme danger to life, especially when fired from a rifled weapon at close range, and when the ball, as in this instance, is a conical one. Dr. Frank Hamilton, Surgeon General of the American army during the late Southern war, and one of the highest authorities on this subject, speaks of this injury as follows: "Gunshot fractures of the upper third of the shaft of the femur" (thigh bone) "are generally fatal, but if the main artery and the principal nerves are uninjured, the life is in general less hazarded by an attempt to save the limb than by amputation." Acting upon this principle which accorded with my own experience, a fracture bed was constructed under my superintendence of such a nature as to obviate the necessity of moving him in the slightest degree for any purpose whatever, and a course of treatment inaugurated which under the careful management of Assistant Surgeon Rolph and Staff-Sergeant Holme—now a registered practitioner—has been productive of the best results possible in the saving of both life and limb. I remained with him personally until the 16th of July, since which time I have not seen him, but Staff-Sergeant Holme under date of 15th November, wrote in answer to my enquiries, as follows:—

"With regard to Sergeant Paterson, I have to inform you that he has returned to duty on the 5th of October, although he was actually doing duty a week previous. He has thrown away his crutches more than two weeks ago. There is considerable bowing of the leg, but only 2½ inches of shortening. He is assistant Quartermaster

Sergeant here, and has a great deal of walking to do; he is well adapted for the work, having occupied that position before at Macleod. He is unable to ride, and is incapacitated for that duty for the rest of his life."

Sergeant Paterson has no desire to leave the Force if some permanent office work is provided for him in it, which I should be glad to see done if possible. The result, under the circumstances, may be regarded as very good.

On the 31st of August the letters of Superintendent Steele and Acting Hospital Sergeant Mackay, dated Battleford, 24th August, enclosing daily sick reports for the week ending at that date, were placed in my hands by the Commissioner, which first revealed to me the condition of affairs at that post, when I immediately forwarded to the Commissioner my report. After clearly pointing out from the symptoms recorded "that this fever is of malarious origin," but "that some few, at least, of the cases have passed during their course into typho-malarial fever," I direct attention to the influences which alone could account for the presence of this dangerous complication, urging immediate attention to the recommendations made, because "the mere fact that typho-malarial fever is present in the post implies the existence of a competent cause, and should lead to a prompt and vigorous removal and disinfection of all possible and suspected sources of contamination."

These suggestions were at once telegraphed to Battleford by the Commissioner and were more or less acted upon at the time with beneficial results; but much remained to be done when three weeks later I arrived with him at that post.

Having already given expression to the views entertained by me respecting the specific character and exciting cause of the fever prevailing at certain seasons of the year, more particularly in autumn, throughout various portions of these Territories; opinions based not alone upon personal experience and long familiarity with its characteristics, acquired during thirty-three years of active professional life in a highly malarious and extensive district of Ontario before my appointment to this Force five years ago; but on a careful comparison of my own observations with those of the most eminent and enlightened authorities on this special branch of pathological science in every part of the world, during the last hundred years. I should not again have reverted to the subject, but for the reference made to it by Assistant Surgeon Kennedy in his annual report from Macleod for the current year, before reading which I was not aware that "medical men throughout the Territories entertain different opinions regarding its nature, cause, symptoms and treatment." If this be really so, it will, I think, be found on examination that these alleged differences of opinion are mainly due to the different degrees of general knowledge, experience, aptitude for such investigations, opportunities, &c., brought to bear by differing individuals upon the subject of malaria, and the special characteristics observable in diseases dependent solely upon its presence for existence.

In the report here referred to, Assistant-Surgeon Kennedy expresses no definite opinion respecting it, but the general tenor of his remarks conveys the impression that he regards this fever as one, the nature and specific cause of which have not hitherto been accurately observed and apprehended; that it is, in fact, an anomalous form of fever peculiar to the tract of country indicated by him, and not one universally known and recognized by competent professional men everywhere at the present day, and in this assumption recommends that "collective investigation" into all available knowledge relating to it be made by assistant surgeons throughout the force, and that their observations and records may be ultimately submitted to the senior surgeon for careful examination and analysis; upon which materials so obtained he considers "it ought to be possible to found a treatise which would prove not only of infinitive service to the medical corps of the Force, but a valuable addition to medical science."

In reply to this suggestion I can only say that nothing will afford me greater pleasure than to receive from every one of the Assistant Surgeons in charge of posts throughout my medical jurisdiction an accurate, and carefully prepared record of observations made by them based upon cases of this fever occurring at various outposts under their own special superintendence, which might also be contributed over

their own signatures to the medical periodicals of the day, for which the senior surgeon will be glad to prepare a paper on the same subject; not only because every honest effort to instruct others tends, in an especial manner, to educate ourselves, and that every careful observer should be willing to contribute his mite, however small, to swell the sum of human knowledge; but because, from the remarks made by Assistant Surgeon Kennedy, it would appear that some, at least, who might reasonably be expected to be better informed are still ignorant of the long observed and universally recognized cause commonly known as "malaria," which throughout extensive but clearly defined portions of the earth's surface, in both hemispheres, at particular seasons of the year reign supreme; to the presence of which exciting cause alone the "fever" now under consideration is unquestionably due, and, in the *absence* of which, as has been conclusively demonstrated, neither this endemic fever, variously modified as it will be by the climate, season, soil and physical aspects of the geographical region in which it is domiciled, nor any other of the well known kindred affections distinctly traceable to the same malignant agency, either can or do actually anywhere exist; and if the assertion made by me that the "fever" here referred to as recently prevailing to so great an extent at Battleford, and to a less degree, but from the same cause, at Macleod, is clearly due to the presence of "malaria" is questioned by any, I would draw attention to the fact which will be questioned by no one who has studied its characteristics, that this "fever" is invariably, during its earlier stages, either intermittent or remittent in character, and that it is no longer doubted by competent observers that no other cause in the absence of malaria is capable of producing like results.

If the above facts respecting this "fever" are admitted, as I venture to think they will be, by physicians everywhere, the "different opinions regarding its nature, cause, symptoms and treatment," which Assistant Surgeon Kennedy asserts, "medical men stationed throughout the Territories entertain," will no longer prove a stumbling block to its rational understanding and treatment; because when once its nature and specific cause are recognized and accepted, the course of treatment indicated becomes clear to everyone capable of appreciating such knowledge, even though, as must often be the case, marked differences of type may be observable in the character of succeeding epidemics, even when occurring in the same locality, according as they are modified by the season at which they occur—the heat and dryness of the preceding summer, the nature of the soil and the habits of those exposed to their influences.

This fever is no stranger to scientific men, no newly discovered form of disease peculiar to these Territories, the elucidation of which, as Dr. Kennedy thinks, would prove a valuable addition to medical science, but one long intimately observed and diligently studied, wherever through the varied regions of the habitable earth the footsteps of enlightened men have trod. The almost ubiquitous exciting cause, to which it owes its origin, has been ever increasingly recognized and accepted since first in 1689 the Italian Lancisi published his original work respecting it, though the steady advance of knowledge since his time, and especially the labors of Dr. William Ferguson in the beginning of the present century, have added greatly to our information respecting it, and have cleared out some errors and misapprehensions under which Lancisi necessarily labored.

This fever is under no circumstances contagious, that is, communicable from man to man, though a number of cases occurring simultaneously in certain localities might lead the ill informed to an opposite conclusion; it therefore never becomes, like cholera and typhus fever, epidemic. It invariably preserves its endemic and non-contagious character even in its most virulent forms. It is found prevailing in its season and under conditions now well understood, within certain clearly defined limits on every continent and the majority of islands between the latitudes of Iceland and Terra-del-Fuego, and throughout all degrees of longitude, variously modified by climatic and atmospheric conditions, local influences, the prevailing temperature, the nature of the soil and its elevation, &c. Its effects, as a rule, increase in intensity as we approach the equator, but are everywhere intensified by the long continuance of

a high temperature, and are unfavorably modified, often to a very fatal degree by the accessibility of its habitat to sea or saline water, as in the Tuscan Maremma, (whence we derive its name "mal'aria") and the tidal marshes, bayos and embouchures of rivers common to parts of the coast of North and South America, of Africa and of Asia.

It is the same fever as that which, in 1794, prostrated so large a proportion of our army encamped at Rosendaal and Oosterhout in Holland, where the soil is a level plain of sand or silt, with a perfectly dry surface and little vegetation, much of the same character as that of the plateau on which the post at Battleford stands, and of much of the valley below it, but containing more moisture. It is the same fever which, as recorded by Sir Gilbert Blane, raged as a deadly pestilence among our troops encamped on the island of Watcheron in 1809, where the soil is precisely similar; yet, "after a hot and dry summer, the force suffered to a degree almost unprecedented in the annals of warfare."

"After the battle of Talavera," as we learn from Sir Thomas Watson and Dr. Wm. Ferguson, "the army retreated along the course of the Guardiana River into the plains of Estramadura. The country was so arid and dry for want of rain that the Guardiana itself and all the smaller streams had ceased to flow and were no more than detached pools in the course that had formerly been rivers" (a condition closely resembling that of immense expanses of the great valley of the Saskatchewan and much of the country surrounding Battleford during the autumn months of 1886, and in a less degree the valley of the "Old Man's River," stretching westward from Macleod during the same period). Yet there, continues Dr. Ferguson, "the troops suffered from remittent fever of such destructive malignity that the enemy and all Europe believed the British host was extirpated."

But elevated and ordinarily salubrious situations may suffer from a like infliction if, as in the case at Battleford and Macleod, they lie in the direct line of the prevailing winds which come to them, after unusually hot and dry summers, over arid flats, dried up marshes and old river beds, extending to great distances on their windward side.

A very severe outbreak of this fever occurred among our troops at Ciudad Rodrigo, which is situated on the high, rocky bank of the River Agueda, a bare, open, hollow country lying at some considerable distance to the westward, "which, after having been flooded in the rainy season, had become as hard, barren and dry as a brick ground," but from which, borne by the prevailing winds, "there arose to our troops a fever which, for malignity of type, could only be matched by that before mentioned on the Guardiana."

But there is another condition under which elevated and ordinarily dry ranges of country, such as are common throughout these Territories and over large expansions of Central Asia, become subject to very severe forms of the same endemic fever, namely, when after an unusually wet spring and summer, the autumn months are intensely hot and dry. I know of elevated, dry and ordinarily healthful regions of Ontario which have more than once, within my own experience, suffered from severe malarial endemics under these conditions. The same thing has occasionally happened at Gibraltar, and more frequently on the high and rocky islands of Minorca, Sicily, Sardinia and the Cyclades, and will hereafter, I have no doubt, as these Territories become more intimately known and inhabited, be found prevailing during certain seasons over vast expanses of high, rolling country when these conditions, essential to its presence everywhere concur to favour its development.

That malaria, pure and simple, constituted the prime exciting cause of the severe endemic fevers already adverted to, no well informed physician at the present day questions, but in the light of later knowledge it may be, at least, suspected that in the specially fatal instances recorded as occurring where large bodies of troops were crowded together in naturally unhealthy encampments, in the presence of an enemy, the baneful influences of malaria were fatally intensified and complicated by the addition of poisonous *miasmatic* emanations begotten by the decomposition under heat and moisture of the various animal refuse and excreta incident to the neighborhood of all camps under like conditions; to a combination of which

causes, it is now well known, the deadly endemic fever which decimated the American army of the Potomac in 1862, in the fatal swamps of the Chickahominy, since then known everywhere as "typho-malaria" fever, was very largely to be attributed. The very same complicated form of fever is capable of being developed under analogous conditions, as we have already more than once been rudely reminded, in all cities, posts, encampments and even isolated houses situated in the malarious districts, where the strict observance of sanitary regulations during such seasons is neglected.

In illustration of the principles I have here endeavored concisely to explain, I may mention the fact that during the past season only two or three mild cases of intermittent of a few days' duration have occurred at Regina, which post during the same months of 1885 suffered from the prolonged invasion of a malignant form of malarial remittent, modified by the unfavorable conditions referred to in my report for that year; and our present immunity, after an abnormally hot and dry season is to be attributed solely to the extremely small rainfall over a country preternaturally dry, and the maintenance at a high and uniform level, by means of a dam constructed at some distance below it, of the water in the creek running past the post, which would otherwise, as in former and equally rainless summers, have altogether disappeared, exposing its dry channel and the adjacent uncovered flats to the intense heat of the July, August and September sun.

In the foregoing pages I have barely touched upon this important subject, but have said more than I originally intended, more perhaps than may be considered necessary in a general report of this nature; but it is a subject the importance of which, in its relation to the health and well-being of the Force stationed at various remote posts throughout these Territories, over which I have been considered competent to preside medically, cannot be over estimated, and its insertion in my annual report will be more likely to bring it within the notice of those especially interested in maintaining its health and sanitation than a more labored article contributed to the medical press, and may be the means of inducing some, at least, to look more deeply into the subject to which it specially refers, and on which so much that deserves careful study has been written.

More than one of our posts throughout the North-West Territories have suffered during past seasons from endemic malarial fever, from which, under certain conditions at present beyond our control, they cannot altogether escape; but the more deadly form of fever known as the "typho-malarial," of which instances too frequently occur, may be averted altogether by a strict observance and enforcement of sanitary laws—because this complex, protracted and often fatal fever requires for its generation, not malaria only, but the presence, in addition to malaria, of putrid animal miasmata.

We have at present in these Territories, exclusive of small detached outposts, eight considerable posts, namely, Regina, Prince Albert, Battleford, Fort Saskatchewan, Calgary, Macleod, Lethbridge and Maple Creek, at each of which an assistant surgeon should be stationed. To supply this demand we have at present five assistant surgeons; one post, namely, Maple Creek, being left in charge of Staff-Sergeant Holme, whose term of service expires early next spring; the posts at Prince Albert, Calgary and Lethbridge being at present under the medical charge of local civil practitioners. It would be more satisfactory if an assistant surgeon were appointed to each of these posts. Calgary, especially, should have one. There is no difficulty in obtaining, as I have already shown, competent, capable and trustworthy men, of character and reputation, to fill these positions, beginning at a very reasonable salary. Some arrangement must be made for Maple Creek before Sergt. Holme retires; and, if others are appointed, I would recommend that Assistant Surgeon Aylen be placed in charge of Calgary; he is a capable and thoroughly trustworthy man, and the post is an important one, requiring the constant presence of a medical officer, which cannot be the case when it is dependent on a civil practitioner, whose duties necessarily take him away at times when he may be urgently required.

An unusually large number of men have been invaded during the year ending 1st December, 1886. A list of these, thirty four in number, will be found in "Schedule

No. 1," to which I desire to draw your special attention. An examination of this schedule reveals the fact that of these thirty-four no less than twenty-five were invalided either for diseases with which they were admitted to the Force by examining surgeons, or which, such as rheumatism and syphilis, they had suffered from previous to their enlistment, the first of which is extremely liable to recurrence from exposure, and the second, to the appearance of secondary tertiary affections after various periods. Of the remaining nine, one was not re-examined on his arrival at Regina, and may like many others rejected for the same disease on re-examination, have entered the Force with "hernia." And a second was a "chronic malingerer," who had exhausted every device to escape duty since he entered the Force and was quite capable of producing artificially the condition of the ear for which he was finally invalided or discharged as unserviceable.

But leaving the last two out of the question and assuming that all those not included in the twenty-five above mentioned were really unfit for service and incurables from diseases acquired after admission to the Force, the number of those whom it would have been found necessary to "invalid," had they been rigidly and scrupulously examined before admission, would have been reduced to nine-tenths of one per cent. for the whole Force. And I am satisfied that some even of these, amounting to at least 15 per cent., might have been rendered fit for service had they not determined to make their ailments a means of escaping from their engagements.

A careful examination of the schedule referred to, which has been prepared not without labor, will indicate more strongly than any verbal representation made by me, the necessity for using greater judgment in the selection of examining surgeons, the medical examination of recruits being often very insufficiently performed. I would also recommend that the following questions be asked in addition to those already contained in the medical examination papers, and the utmost care taken to see that they are all answered correctly and truthfully, namely, has the applicant ever suffered from any of the following affections: 1, Rheumatism? 2, Syphilis? 3, Hamoptyses? 4, Epilepsy? If there is any reason to believe that he has, he should be rejected without hesitation.

In compliance with the recommendation made in my annual report for 1885, all men regarded as incurable, and therefore unserviceable at the outposts, have, during the past year (with the exception of some one or two invalided by Assistant Surgeon Kennedy, at Macleod), been sent down to headquarters to be invalided, with the result that nearly one-half of those so sent down, have, after longer or shorter treatment been "returned to duty," the recommendation having been apparently taken advantage of to send all troublesome cases that were capable of travelling, to headquarters for treatment, with many who only feigned illness and were not actually sick at all. Out of one batch of twenty-five sent down from Battleford and Calgary, to be invalided for various nominal diseases, fourteen were given their choice, to return to full duty forthwith, or to go to the guard room, at hard labor, and elected the former. They were simply impudent malingerers, who had hitherto succeeded in deceiving the medical officers at the posts. But while this regulation has tended to show how necessary it is that no man should be invalided, except from headquarters, it has at the same time largely swelled the sick lists at Regina, because, not only those invalids, but every man who appears on the daily sick reports, for the most trifling ailment, such as constipation or trivial relaxation of the bowels is entered upon the hospital books, from which the annual report is subsequently compiled. And these books have been kept in such manner during the greater part of the year now expired, as to render it impossible to obtain any trustworthy information from them. Since the arrival of Assistant Surgeon Rolph at this post, on 17th September, 1886, some effort has been made to keep them more accurately. But, notwithstanding this, the sick report now forwarded, presents an amount of sickness far in excess of what the true facts would substantiate, were it possible to obtain them. The errors discovered in making out this list, rendering it highly probable that others equally important may have escaped detection. This sick report is now forwarded with the annual report of Assistant Surgeon Rolph, who declines to be responsible for its accuracy.

If I am called to Ottawa during the present winter with relation to the hospital supplies. I shall have an opportunity of speaking at greater length on this and other matters relating to my duties in the North-West, and of offering some suggestions respecting these reports.

The following reports for 1886 are herewith forwarded :—

Annual Report of Assistant Surgeon Kennedy for Macleod, and Sick Report.

Annual Report of Assistant Surgeon Miller for Battleford.

Annual Report of Assistant Surgeon Baldwin for Battleford.

Annual Report of Assistant Surgeon Rolph for Regina, and Sick Report.

Annual Report of Assistant Surgeon Aylen for Fort Saskatchewan, and Sick Report.

Annual Report of Acting Assistant Surgeon Henderson for Calgary, and Sick Report.

Annual Report of Acting Assistant Surgeon Bain for Prince Albert, and Sick Report.

Annual Report of Acting Assistant Surgeon Mewburn for Lethbridge, and Sick Report.

Annual Report of Staff Sergeant Holme for Maple Creek, and Sick Report.

Annual Report of Staff Sergeant Hazelton of the Sick of "B" Division while at Wood Mountain.

I have the honor to be, Sir,

Your obedient servant,

A. JUKES,
Senior Surgeon.

L. W. HERCHMER, Esq.,
Commissioner North-West Mounted Police,
Regina.

SCHEDULE No. 1.—Showing Men Invalided in 1886.

Names.	Regtl. Number.	When Invalided.	Disease.	All thus marked X found unfit on admission.	Remarks.
<i>Constables.</i>		1886.			
Field, Samuel	1758	April 27	Varix	X	Sent down from Calgary.
Ross, G. M.	1158	do 29	Imperfect transition of both testicles	X	Regina.
Lothrop, Wm.	1271	May 10	Varix	X	Battleford.
McRae, M.	1552	do 10	Feeble and unfit for service.	X	do
Donnelly, J.	1375	do 10	Naso-pharyngeal catarrh	X	do
Godwin, W. H.	1171	do 11	Hernia	X	do not re-examined.
Davis, E. F.	656	do 11	Rheumatism	X	do do
Dufresne, Ovida. ....	.....	do 12	Dyspepsia from loss of all molars	X	do
Williams, Wm.	841	do 11	Varix	X	do do
Cowan, S. J.	1374	June 10	do	X	Lethbridge.
Johnstone, R.	1467	do 10	Varicocele	X	do
Huot, T. R.	1501	.....	Diseased ears	X	Invalided by Kennedy, at Macleod.
Patrick, J. S.	1576	June 7	Phthisis	X	Battleford.
Unwin, R. S.	1019	do 7	Varix	X	Regina.
Green, H.	1245	Aug. 3	Asthma .....	.....	do
Fredericks, F.	1241	do 13	Chronic malingerer .....	.....	Calgary.
Egan, John.	1496	do 13	Chronic bronchitis	X	do
Carrick, R.	1162	Sept. 13	Chronic syphilis	X	do
Phillips, A. O.	720	Oct. 14	Hernia .....	.....	Macleod.
Robinson, J.	1591	do 16	No disease; should never have been accepted.	X	Battleford.
Pocock, H. R. A.	1107	Nov. 10	Frozen feet .....	.....	Prince Albert.
Sunderland, W.	836	do 10	Albuminuria .....	.....	Calgary.
Woodhouse, S.	1057	do 6	Old injury and deformity.	X	Macleod.
Catterall, O.	1732	do 6	Rheumatism	X	do
Mowatt, G.	1627	do 6	Injury to hand .....	.....	do
		1885.			
Jenkins, W.	1645	Dec. 8	Old injury of spine; crushed between two railway cars	X	Battleford; re-examined.
Earle, K. R.	1643	do 8	Chronic pleuritis with suppuration	X	Regina; a new recruit.
Broderick, T.	1212	do 8	In my opinion a malingerer .....	.....	Regina; not re-examined; invalided by Asst.-Surgeon Baldwin.
Cotter, W. E.	1373	Jan. 22	Phthisis	X	Invalided by Dr. Baldwin.
Price, J. W.	1725	do 16	Old wound of hand; disabled... ..	X	do
Adams, D.	1198	Dec. —	Chronic syphilis	X	Came up with acute disease.
Spencer, J. S.	1724	Jan. 28	Rheumatic heart	X	Came up with it.
		1885.			
Wharton, F.	1327	Dec. 8	Rheumatism .....	.....	Regina.

A. JUKES, M.B.,
Senior Surgeon.

APPENDIX O.

ANNUAL REPORT OF ASSISTANT SURGEON KENNEDY.

MACLEOD, 1st December, 1886.

SIR,—In accordance with your instructions, I have the honor to present herewith the annual medical report for this post for 1886.

A general survey of the appendix conveys the impression that there has been rather more than the average amount of sickness during the past year, an impression which on close examination proves to be well founded. Regarding the nature and causes of this excess of ill-health, I will have some remarks to make after I have briefly reviewed the monthly sick reports.

For the sake of convenience the medical year is reckoned from the 30th of November. Commencing then with the month of December, it is found that there were 8 cases of fever, one of which was convalescent from November, and therefore shown on the report for 1885. The fever cases were not of a serious type and were easily checked by appropriate treatment. Excepting one case of erysipelas, there is nothing else worthy of note in the record of the month, the other diseases being for the most part those incidental to the season.

In January, besides eleven cases of fever of the same class as that of December, there are four cases of scarlet fever on the report. This fever was undoubtedly imported from the east by "H" Division which arrived here in December. All of these cases, together with one which appeared in February, were "H" Division men, and all recovered in due time. The advantage of a good hospital was at this time thoroughly realized, for with six other patients in hospital, I was able to so well isolate the scarlet fever patients, as to prevent the disease from spreading not only in the barracks, but among the other patients in the hospital itself.

February and March present nothing of interest; save five cases of fever and the practical termination of the scarlet fever. I might perhaps mention a very severe case of concussion of the brain—Corp. Young—the result of a fall from a horse.

During April, May, June, July and August, the health of the post was very fair, there being nothing of interest; save one severe case of fever, which lasted during July and August.

In September, however, the arrival of "D" Division from Battleford marked the re-appearance of a fever, which has kept our hands busily employed up to the moment of writing. Four cases were taken into hospital immediately on the arrival of the division. Of these three had been ill for four days on the march, and one for twelve. The latter, Constable Collins, was so debilitated that his vital powers were unequal to the task of rallying, and despite the most careful nursing and the generous administration of stimulants, he continued to sink until his death on the 2nd of October. I have already furnished you with a more detailed report of his case.

The fever which appeared on the arrival of "D" Division was not confined to that division, for out of a total of twelve cases occurring in September, October and November, seven were belonging to "D" and five to "H" Division. There are now in hospital seven cases, six being convalescent, and the remaining one almost so.

Consulting the appendix again, it is found that there are recorded in all thirty-eight cases of fever. Of these thirty-eight, one was convalescent from last year, twenty-four were of a mild type, and thirteen severe. Of the latter one died.

Now, regarding this fever, of which so much has been written and said, I have had eight years' experience of it in different parts of the Territories, and I think I may safely claim the right, probably for the last time, to be heard on the subject. I do not propose to put forward opinions, but simply to state a few facts, and to make a suggestion which, impressed as I am with its importance, I most earnestly trust will be acted upon.

The facts are briefly these: Throughout the whole country, from Regina on the east to the Rocky Mountains on the west, and from the international boundary line to the Saskatchewan (and beyond it, for aught I know) there is prevalent a fever which annually causes a large amount of sickness among the men of our Force. Leaving out of the question typhoid fever, which has a definite cause to which it can be generally traced, I believe that the main features of this fever are common to all cases. Medical men stationed throughout the Territories, however, entertain different opinions regarding its nature, cause, symptoms and treatment. Believing, as I do, that the essential features of the fever are the same in all parts, varied only by locality and environment, I am convinced that it is possible, not only to reconcile varying opinions and to give each practitioner a reason for the faith that is in him, but in doing so to afford a material assistance to the future successful treatment of the disease.

Collective investigation offers this solution. Let the senior surgeon be authorized to instruct assistant surgeons to make and keep an accurate record of each case, such record to be accompanied by a properly kept temperature chart. Let every symptom be noted with the utmost care and the treatment given in detail—in short, let the history of every case be complete from its inception to its termination. Let these records be forwarded to the senior surgeon at the expiration of the year, and, if properly classified and worked up, it ought to be possible to found, upon the materials so obtained, a treatise which would prove not only of infinite service to the medical corps of the Force, but a valuable addition to medical science.

My impression of the importance of this suggestion (which alone has induced me to venture to make it) may not be shared by others, but I sincerely trust it will be carried out, as I am satisfied it will redound to the welfare of the Force.

Returning now to the appendix, the next item which attracts attention is that of rheumatism, of which there are forty-one cases. This is a large number, but there were only two cases of any severity, the others being subacute and chronic. One was sent to Regina for further examination by the senior surgeon. Besides this case, four others with different diseases were sent to Regina for the same purpose and two were invalided direct.

The average daily number of patients in hospital and off duty during this year was eight, being a percentage of about five. The daily sick report averaged thirteen which is a little over eight per cent. This includes all cases of "light duty" and "medicine and duty."

I have the honor to be, Sir,

Your obedient servant,

G. A. KENNEDY,
Assistant Surgeon.

To the Commissioner,
North-West Mounted Police,
Regina.

NORTH-WEST MOUNTED POLICE.
GENERAL Sick Report for the Year 1885-86.

Diseases.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.	
<i>General Diseases.</i>					
Fever.....	38	627	16½	1 died; 5 convalescing in hospital; 2 in hospital; 30 returned to duty.	
Scarlet fever.....	5	209	40		
Rheumatism.....	41	401	10		
Furuncular Dis.....	20	95	5		
Erysipelas.....	5	23	5½		
<i>Diseases of the Organs of Circulation and Respiration.</i>					
Cold.....	107	272	2½		
Tonsillitis.....	4	6	1½		
Pain in chest.....	2	2	2		
Varicose Veins.....	2	2	2		
Pleurisy.....	2	10	5		
<i>Diseases of the Organs of Digestion.</i>					
Diarrhoea.....	43	72	2		
Constipation.....	4	29	7		
Biliousness.....	23	51	2		
Hæmorrhoids.....	13	142	11		
Dyspepsia.....	3	3	3		
Colic.....	3	6	2		
Sore throat.....	1	10	10		
Gastritis.....	1	5	5		
<i>Diseases of Nervous System.</i>					
Headache.....	3	10	3		Special report.
Earache.....	3	7	2		
Toothache.....	19	30	1½		
Neuralgia.....	10	11	1		
Pain in back.....	6	18	3		
Concussion of brain.....	1	41	41		
Vertigo.....	1	.....	.....
<i>Diseases of the Genito-Urinary System</i>					
Bubo, sympathetic.....	9	224	23		
Irritability of bladder.....	3	68	28		
<i>Surgery and Minor Surgery.</i>					
Sprain.....	49	373	7½	2 sent to Regina.	
Chafe.....	10	56	5		
Bruise.....	2	4	2		
Incised wound.....	9	102	11	Invalided.	
Bite.....	5	36	7		
Contusion.....	34	237	7		
Frost bite.....	2	6	2		
Whitlow.....	4	60	5		
Otorrhoea.....	1	41	41		
Burns.....	1	6	6		
Minor ailments.....	11	13	1		
Traumaty injury of urithæa.....	1	14	14		
Hernia.....	1	20	20		Sent to Regina.

G. A. KENNEDY,
Surgeon.

Fort McLeod, 30th November, 1886.

APPENDIX P.

ANNUAL REPORT OF ASSISTANT SURGEON MILLER.

MUSKOWPETUNG, 16th, December, 1886.

SIR,—In accordance with instructions I have the honor to transmit the following annual report:—

At Prince Albert during the winter there were very few cases of sickness amongst the men, two of these were typho-malarial (mountain fever) and made good recoveries.

On the 11th April I left Prince Albert for Fort Macleod, reaching that post on the afternoon of the 21st.

My instructions from you were to report from there on the 22nd.

After having had medical charge of Fort Macleod for a month, I left that post for Battleford, as instructed, on the 22nd of May, arriving at the latter place on the 28th of May.

There were not many cases of sickness at Fort Macleod during the time I was stationed there. Only one case of mountain fever (malarial typhoid) was treated by me during that time, and the patient who made a good recovery was an outsider.

During the summer months the heat was very intense and drought prevailed; swamps were dried up and typho-malaria (mountain fever) was developed in the neighborhood early in July.

The officers and men in the barracks suffered from it. The town furnished a number of cases, and residents on the reserves were affected by it.

Superintendent MacDonnell was the only officer who escaped altogether. Three of the men died from it, Constables Rummerfield, Sturge and Mason. Constable A. E. Cowan was drowned in Battle River. Sanitary precautions were carefully observed and every means used to promote the comfort and well-being of those who were ill.

Quinine, medical comforts, stimulants, beef tea and milk were judiciously administered.

Leave having been granted me, I left the Battleford post at the end of September, in care of Dr. Baldwin, to whom the medical charge was transferred.

I have the honor to be, Sir,

Very respectfully yours,

ROBERT MILLER, *M.D.C.M.*

To the Commissioner,
North-West Mounted Police,
Regina.

APPENDIX R.

ANNUAL REPORT OF ASSISTANT SURGEON BALDWIN.

BATTLEFORD, 30th November, 1886.

SIR,—I have the honor to enclose my annual report for the year ending 30th November, 1886.

On my joining the Force in November, 1885, I was stationed at Regina, where I performed the duties of post surgeon until 25th August, 1886, with the exception of a few days in July, when I was attached to "F" Division, under Superintendent Perry, during their stay at Regina and Long Lake, the principal medical officer relieving me of my duties as post surgeon while I was attached to that division.

In December, 1885, there were two cases of infectious disease—scarlet fever, which occurred among the recruits brought from the East by Inspector Howe. The patients were carefully isolated and made a quick recovery, no more cases occurring.

During the winter and early spring the daily sick reports contained no very serious cases, and, when the unavoidably crowded condition of the barrack rooms during that period is taken into consideration, it can be fairly stated that the health of the men was remarkably good.

On the arrival of "F" Division at Regina, owing to a number of the men suffering from diarrhoea brought on partially by the water along the line of march from Prince Albert, from which post they came, it was deemed advisable to send the division to Long Lake for a few days. I accompanied Superintendent Perry as medical officer, and I am happy to state that we returned to Regina without a single case of illness among us.

On my return from Long Lake I again took medical charge of the headquarter post, under the principal medical officer who had relieved me during my absence, where I remained until 25th August, when I was relieved from duty and ordered to Fort Macleod on the 27th.

On my arrival at Macleod I was attached to "C" Division, in order to accompany them to Red Deer Crossing on their way to Battleford. We left Macleod on the 2nd of September, and, on arriving at the Red Deer, it was found advisable that I should continue in medical charge until the arrival of the division at Battleford.

During the journey from Macleod to Battleford, the men enjoyed excellent health, with the exception of three cases; but those, I am glad to say, made a very good recovery.

On arrival at Battleford I was ordered to await the arrival of the Commissioner, who was expected there, and on his coming I was placed in medical charge of this post, Surgeon Miller having applied for sick leave, which was granted.

On my assuming charge, 26th September, there were eighteen patients in hospital suffering from typho-malarial fever, and convalescing from that disease an epidemic of which had appeared in this district during the summer, as the cool autumn weather set in, however, the disease abated both in the post and in the surrounding country; and although I am sorry to say we had three deaths among the men from this cause during the months of August and September, at present there is not a single case among the men under my charge, and only one altogether in Battleford.

I may state in this connection that the outbreak of typho-malarial fever is to be accounted for to a great extent by the extremely dry season and the low sandy nature of the soil in and about Battleford.

At the present time the health of the men at this post is all that can be desired,

notwithstanding the fact that "C" Division has only just moved into barracks, having been under canvas since their arrival here until the 22nd inst., when the new barrack room was turned over to the Force.

The new hospital has been occupied since the 4th of October, and is a light commodious building, consisting of two large wards, surgery and staff sergeant's room and kitchen. It will when completely finished and furnished be equal to any hospital in the Force.

I have the honor to be, Sir,

Your obedient servant,

H. Y. BALDWIN, M.D.C.M.,
Assistant Surgeon, N. W. M. P.

To the Commissioner,
North-West Mounted Police,
Regina.

APPENDIX S.

ANNUAL REPORT OF ASSISTANT SURGEON ROLPH.

REGINA, 13th December, 1886.

SIR,—I have the honor to enclose the annual sick report for the year ending 30th November, 1886. Having assumed medical charge of this post on the 17th of September last, I can only hold myself responsible for the portion of it subsequent to that date. The previous portion is taken from the various books and returns at my disposal, and is, I believe, substantially correct.

At the commencement of last year I was in medical charge at Battleford. It is unnecessary for me to speak fully of the sanitary condition of that post, as it has since been visited for that purpose by the principal medical officer. I can only say that I abstained from reporting very strongly, except in relation to one of the rooms, because I knew that it was a military necessity that a large force should be kept in that part of the country during the winter. I was also informed that new barracks were to be erected as soon as the frost was out of the ground, and I saw large quantities of lumber hauled into the post for that purpose during the winter. The sick list was very large during the winter months, which was partly due to the unfavorable sanitary condition, and partly to my allowing myself, owing to want of experience in military medicine, to be imposed upon by a number of malingerers.

During the first week in June I was removed to Maple Creek. There were only a small number of men in the post, and no cases of serious illness. We had, however, a fracture of the fibular, and internal malleolus, brought in from one of the outposts, which made a good recovery, and a very severe case of gunshot fracture of the upper third of the femur, which, when I left Maple Creek in August last, was progressing favorably, and with no more shortening than was to be expected in so serious an injury. On the 20th of August I received orders to proceed at once to Battleford, where I arrived about noon on the 25th. I found twenty-four cases of fever in the hospital and barrack rooms. Some of these were comparatively slight or nearly convalescent, but others, notably Constable Sturge and Staff-Sergt. Mercer, very severe, and of a decidedly typhoid type. Constable Sturge continued to sink, and died about 5 a.m. on the 29th. Assistant Surgeon Miller was convalescent when I arrived, and was able to resume duty on the morning of the 30th.

I left Battleford at 8 a.m. on the 1st September, in medical charge of "D" Division. After consultation with Assistant Surgeon Miller, I decided to leave eight men of this Division behind, as unfit for the journey over the prairie. After we had been out some days, symptoms of fever showed themselves in Constable Collins. The disease was undoubtedly contracted while at Battleford, but as I have already explained in a special report on the case, did not show itself sooner—the period of incubation covering the intermediate time. He received every attention that was possible on the prairie, but the fatigue and exposure of the journey were of course injurious, though not more so, in my opinion, than the surroundings in Battleford would have been. On our arrival in Macleod the fever assumed a decidedly typhoid form, and he has since died. The day after reaching Macleod, I was ordered to report at headquarters, and reached here on the night of the 16th September, assuming medical charge the next morning. Since then there has been nothing of any medical interest to report.

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

J. WIDMER ROLPH, M.D.,
Assistant Surgeon.

To the COMMISSIONER,
North-West Mounted Police.
Regina.

NORTH-WEST MOUNTED POLICE.

ANNUAL Sick Report for the Year 1886.

Diseases.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.
<i>Medical Cases.</i>				
Albuminuria	1	29	29	
Angina Pectoris	1	93	93	
Asthma	1	128	128	Invalided.
Biliousness	14	56	4	
Bronchitis	19	122	6 $\frac{8}{9}$	One invalided.
Catarrh	10	22	2 $\frac{1}{2}$	do
Chills	9	28	3 $\frac{1}{2}$	
Cold	70	103	1 $\frac{3}{8}$	
Colic	11	15	1 $\frac{1}{2}$	
Conjunctivitis	20	88	4 $\frac{4}{5}$	
Constipation	49	56	1 $\frac{1}{2}$	
Cramps	1	1	1	
Deafness	2	8	4	
Debility	34	158	4 $\frac{1}{2}$	Three invalided ; one case brought over from last year.
Delirium tremens (incipient)	1	6	6	
Diabetes	1	25	25	
Diarrhoea	93	123	1 $\frac{10}{11}$	
Dyspepsia	34	122	3 $\frac{1}{2}$	One invalided.
Endocardites	2	14	7	
Epistaxis	1	3	3	
Fevers (malaria)	11	78	7 $\frac{1}{11}$	Two cases sent from Battleford ; one case brought over from last year.
Hysteria	1	2	2	
Lumbago	5	6	1 $\frac{1}{5}$	
Meningitis	1	17	17	
Megrim	34	68	2	
Nephritis	1	25	25	
Neuralgia	44	68	1 $\frac{6}{11}$	
Palpitation of heart	1	10	10	
Pericarditis	1	70	70	Returned to duty.
Pharyngitis	25	38	1 $\frac{3}{8}$	
Phthisis	2	103	51 $\frac{1}{2}$	Both invalided ; one brought over from last year.
Pleurisy	4	15	3 $\frac{3}{4}$	Invalided.
Pleuritic adhesions (old)	1	4	4	Two invalided ; three cases brought over from last year.
Rheumatism	58	484	8 $\frac{1}{8}$	Two cases brought over from last year.
Sciatica	3	36	12	
Scarlatina	3	97	32 $\frac{1}{2}$	Two cases brought over from last year.
Skin, minor diseases of	14	23	1 $\frac{9}{14}$	
Tonsillitis	32	110	3 $\frac{7}{8}$	
Typhlitis	1	35	35	
Ulcerated mouth	4	5	1 $\frac{1}{4}$	
Under observation	2	64	32	
<i>Surgical Cases.</i>				
Abcess	9	46	5 $\frac{1}{3}$	One still under treatment ; one case brought over from last year.
Bubo (sympathetic)	5	52	10 $\frac{4}{5}$	One still under treatment.
Burn	2	15	7 $\frac{1}{2}$	
Carbuncle	1	13	13	
Chafe	35	97	2 $\frac{7}{11}$	
Concussion of brain	1	39	39	
Contusions and slight wounds. ...	108	323	2 $\frac{10}{11}$	One still under treatment ; one case brought over from last year.
Enlarged gland	1	1	1	
Epididymitis	2	84	42	
Fracture, tibia and fibula	2	167	83 $\frac{1}{2}$	Compound comminuted ; 1 case from Moose Jaw Hospital ; 1 case from last year.
do fibula and dislocation of ankle	1	38	38	Brought over from last year.

ANNUAL Sick Report for the year 1886—*Continued.*

Diseases.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.
<i>Surgical Cases—Concluded.</i>				
Fracture, external malleolus	1	76	76	One still under treatment.
do metacarpal bone	1	28	28	
do rib	1	20	20	
do clavicle	2	56	28	
do radius	1	42	42	
do left malar	1	9	9	
do fibula and external malleolus	1	20	20	Sent down from "A" Division.
Finger, amputation of	1	28	28	
Frost bite	12	97	8 $\frac{1}{2}$	One invalided.
Furunculus	13	63	4 $\frac{1}{3}$	
Hæmorrhoids	9	25	2 $\frac{5}{9}$	Both invalided.
Hernia, inguinal	2	24	12	
Injury to hand (severe)	2	116	58	One invalided.
Irritable bladder	2	10	5	
Orchitis	4	26	6 $\frac{1}{2}$	do
Otitis	2	75	37 $\frac{1}{2}$	
Paralysis of bladder	1	7	7	Invalided; brought over from last year.
Sprain	51	159	3 $\frac{2}{7}$	
Stricture	1	11	11	One invalided.
Synovitis	2	208	104	
Teeth extracted	11	11	1	
Testicle misplaced	1	13	13	
Tumours	2	33	16 $\frac{1}{2}$	
Vaccination	1	1	1	
Varix	6	103	17 $\frac{1}{2}$	Four invalided.
Wound (gun-shot)	2	72	36	One case brought over from last year.
do (old)	1	17	17	Invalided.

Daily average of men in barracks during the year, 1886.

do do at morning sick parade during the year, 16.
do do under treatment in hospital during the year, 6.
do do under treatment in barracks during the year, 6.
do do returned to duty during the year, 4.

J. WIDMER ROLPH,
Assistant Surgeon.

REGINA, December 1, 1886.

APPENDIX T.

ANNUAL REPORT OF JR. ASSISTANT SURGEON AYLEN.

FORT SASKATCHEWAN, 14th, December 1886.

SIR,—I have the honor to present you with the report of the Fort Saskatchewan Hospital for the eleven months ending the 30th of November, 1886.

I am sorry not to be at liberty to make a complete annual report, for there has been no record of the diseases treated previous to the 1st of January, 1886; consequently, I cannot make a full report.

On my arrival here last August I found a very slim stock of drugs, and an uninhabitable hospital building. Since then I have received two lots of drugs which I think will be sufficient for the winter. The building then used as an hospital was an old settler's dwelling which he had abandoned, about half a mile from barracks. As there was a very good vacant dwelling about a quarter of a mile away, which could be had for a small sum, I represented the matter to the commanding officer, and he kindly procured the use of said building for the hospital, and it makes a very comfortable one.

It became my duty last October to recommend Regimental No. 1475 constable Thomas to be invalided; he was ruptured last June while riding, and was, I believe, treated by Dr. Munro, but to no avail. I believe him to be unfit for duty, and I would not take the responsibility of returning him to full duty, as I am of opinion it would ruin the man forever.

In accordance with your instructions last November I furnished you with a requisition of drugs required for this division for 1887. I hope all these drugs will be forwarded, as I only ordered what is absolutely necessary.

The men of this Division deserve great praise for the good, moral character they enjoy at present.

The sanitary condition of the barracks is very good indeed.

I enclose you an appendix containing the diseases treated during the eleven months ending the 30th November, showing the number of cases, and the average duration of each disease; a return of medicines showing the amount received, expended, and now in stock, from the 1st of June, 1886; to the 30th of November, 1886; and a return of hospital comforts showing the amount received, expended, and now on hand, from the 1st of June, 1886, to the 30th of November, 1886.

I have the honor to be, Sir,

Your obedient servant,

P. AYLEN, M.D.C.M.,
Assistant Surgeon.

The Commissioner,
North-West Mounted Police,
Regina, N.W.T.

NORTH-WEST MOUNTED POLICE.

DISEASES treated in the Fort Saskatchewan Hospital during the eleven months ending the 30th November, 1886.

Diseases.	Number of Cases.	Average Duration.	Remarks.
GENERAL DISEASES.			
<i>Infectious.</i>		Days.	
Ague	2	5	
Morbilli	1	10	
Remittent Fever.....	1	5	
<i>Constitutional.</i>			
Rheumatism.....	23	9 $\frac{1}{2}$	
General debility.....	3	1 $\frac{1}{2}$	
LOCAL DISEASES.			
<i>Nervous System.</i>			
Neuralgia	13	11 $\frac{1}{2}$	
Lumbago.....	2	6	
Insanity.....	3		Civilians.
Sciatica	1	33	
Odontology	6	1 $\frac{1}{2}$	
<i>Respiratory System</i>			
Asthma.....	1	2	Still under treatment.
Sore throat.....	24	3 $\frac{1}{2}$	
Cough and cold	42	2	
Nasal catarrh.....	3	18	Two improved.
Tonsillitis, acute	1	16	
Bronchitis, acute	1	2	
Influenza.....	4	9	
<i>Digestive System.</i>			
Peritonitis.....	1	1	Still under treatment.
Inflammation of bowels	4	9 $\frac{1}{2}$	
Diarrhoea	16	1 $\frac{1}{2}$	
Indigestion.....	11	1	
Constipation	5	1 $\frac{1}{2}$	
Bilious.....	7	1 $\frac{1}{2}$	
<i>Cutaneous System.</i>			
Acne	1	1	
Tinea circinata.....	1	3	
Hydro-adenitis	1	2	
Chafed hands	1	1	
<i>Genito Urinary System.</i>			
Orchitis.....	1	37	
Varicocele	1	3	

DISEASES treated in the Fort Saskatchewan Hospital, &c.—*Concluded.*

Diseases.	Number of Cases.	Average Duration.	Remarks.
SURGERY.			
Minor surgery	48	10	One invalided, and the other sent to Regina to be sent to Regina.
Hernia	2	24½	
Injury to back.	1	152	Same patient with second attack.
Dislocated ankle	1	67	
Synovitis.....	2	23½	
Coles's fracture.	1	55	
Frost bites	1	14	
Sinus	1	14	
Sprained shoulder	1	12	
SPECIAL SERVICE.			
Conjunctivitis.....	4	9	Still under treatment.
Otitis media	1	1	

P. AYLEN, M.D., C.M.,
Assistant Surgeon.

APPENDIX U.

ANNUAL REPORT OF ACTING ASSISTANT SURGEON HENDERSON.

CALGARY, 6th December, 1886.

SIR,—I have the honor herewith to submit my report for the year 1886.

It is gratifying to have to report that the epidemic of scarlet fever which prevailed in the early part of the year has passed over without any fatalities, and that the efforts then used for its suppression were highly successful.

One death occurred at this post during the year, that of Constable Limn, who died of chronic Bright's disease, after a protracted illness.

The list of accidents is fortunately slight, and those reported were of a comparatively trivial character.

I have the honor to be, Sir,

Your obedient servant,

ANDREW HENDERSON, M.D.,
Surgeon in Charge, "E" Division.

AUGUSTUS JUKES, Esq., M.D.,
Senior Surgeon N.-W. Mounted Police,
Regina.

NORTH-WEST MOUNTED POLICE.

ANNUAL Sick Report for Year ending 30th November, 1886.

Disease.	No. of Cases.	No. of Days.	Average Duration.	Surgeon's Remarks.
Abrasion	3	3	1	Cured.
Adenitis	1	2	2	do
Albuminuria	1	94	94	Sent to Regina for treatment.
Balanitis	4	14	3½	3 cured ; 1 under treatment in hospital.
Biliousness	10	14	1½	Cured.
Boils	7	22	3½	do
Bright's disease	1	174	174	Days in all ; died 25th February.
Bronchitis	1	3	3	Cured.
Bubo (sympathetic)	5	139	27¾	do
Burn	3	11	3½	2 cured ; 1 under treatment.
Catarrh nasal	1	1	1	Cured.
Carious teeth	3	4	1½	do
Colic intestinal	1	1	1	do
Cold	38	59	1½	do
Chills	1	3	3	do
Conjunctivitis	2	3	1½	do
Constipation	19	27	1½	do
Consumption	2	84	42	Sent to Regina for invaliding.
Contusion	31	116	2¾	Cured.
Corns	1	1	1	do
Cough	7	26	3½	6 cured ; 1 transferred to Regina under treatment.
Cut finger	1	11	11	Cured.
Deafness	1	1	1	Relieved.
Debility	2	4	2	Cured.
Diarrhœa	27	34	1½	do
Eczema	2	7	3½	do
Epididymitis	2	28	14	do
Enlarged glands	2	19	9½	1 cured ; 1 transferred to Regina under treatment.
Earache	2	2	1	Cured.
Erysipelas	1	6	6	do
Fever	6	65	10½	do
do intermittent	1	2	2	do
do scarlet	9	191	21½	do
do urethral	1	10	.....	In hospital.
Fracture of fibula	1	32	32	Cured.
Frost bite	1	7	7	do
Granulated eye lid	1	1	1	do
Gunshot injury	1	31	31	do
Gastritis	1	6	6	do
Gleet, old	1	2	2	Went to Edmonton under treatment.
Heart disease	1	52	52	Sent to Regina for invaliding.
Hernia	1	94	94	Relieved.
Headache	2	2	1	Cured.
Indigestion	11	22	2	do
Irritation of bladder	2	2	1	do
Inflammation of lungs	1	14	14	do
Jaundice	1	7	7	do
Kick from horse	1	3	3	Cured.
Lumbago	1	1	1	do
Muscular pains	5	7	1½	do
Neuralgia	9	30	3½	do
Piles	4	17	4½	do
Phimosis	1	3	3	do
Psoriasis	1	1	1	do
Prurigo	1	1	1	do
Palpitation of heart	1	8	8	Transferred to Battleford ; under treatment.
Pleurodynia	2	6	3	Cured.
Rheumatism	5	16	3½	do

ANNUAL Sick Report for Year ending 30th November, 1886—*Concluded.*

Disease.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.
Riding sores	4	25	6 $\frac{1}{2}$	do
Rupture of frenum	1	4	4	do
Sciatica	3	34	1 $\frac{1}{3}$	1 cured, 1 sent to Regina for invaliding.
Seminal emissions	1	1	1	Cured.
Sore foot	2	4	2	do
Sore hand	5	10	2	do
Sore gums	2	2	1	do
Sore lips (bugler)	3	9	2	do
Sore throat	36	145	4	do
Sprain	20	97	4 $\frac{1}{2}$	do
Strain	13	52	4	do
Sty on eyelid	1	3	3	do
Synovitis	6	82	13 $\frac{1}{2}$	do
Tape worm	1	14	14	do
Tumour of scalp	1	1	1	Treatment and duty.
do on chin	1	2	1	Reduced in size; left post.
Toothache	12	15	1 $\frac{1}{2}$	Cured.
Tinea sycosis	1	18	18	Under treatment.
Tinea circinatus	3	3	1	Cured.
Ulcerated mouth	1	2	2	do
Varicose veins	2	12	6	Relieved.
Varicocell	3	9	3	do
Vertigo	1	1	1	Cured.
Whitloe	2	5	2 $\frac{1}{2}$	do
Wound, flesh	1	16	16	do
do in knee punct	1	1	1	do
do in foot do	2	5	2 $\frac{1}{2}$	do
do in hand	5	21	4 $\frac{1}{2}$	do
do in thigh	1	6	6	do
do in wrist	1	4	4	do
do in scalp	1	9	9	do

ANDREW HENDERSON,
Surgeon.

CALGARY, 30th November, 1886.

APPENDIX V.

ANNUAL REPORT OF ACTING ASSISTANT SURGEON BAIN.

PRINCE ALBERT, 30th November, 1886.

SIR,—In accordance with instructions I have the honor to present you with the following report for 1886:—

During the past year the general health of the men at this post has been good. There have been no deaths, and comparatively little serious illness.

Only one man has been invalided during the year, being unfit for service, owing to a frozen foot.

In the early months of the year several cases of malarial or typho-malarial fever are reported. As these occurred before I had medical charge of the post, I know nothing of the causes. In September last, on the return of a detachment of men from duty at Battleford, I found three of the men suffering from typho-malarial fever. Under treatment these cases all recovered.

The supply of medicine at the post has been ample, but the supply of surgical instruments and appliances is very limited, and should, as soon as possible, be increased.

The building used for hospital purposes is far from adequate, but has been made as comfortable as circumstances would permit.

From the beginning of April until October, I saw all serious cases of illness among the men, and since then I have been in regular attendance.

The subjoined statement of cases treated here is compiled from the monthly sick reports, but owing to the absence of a qualified surgeon during the greater part of the year, the nomenclature of the diseases has been very imperfectly observed, consequently I cannot vouch for the correctness of the statement. From my own knowledge, I am of opinion that the statement very much exaggerates the seriousness of the illness here.

I have the honor to be, Sir,

Your obedient servant,

HUGH N. BAIN, M.D.,
Acting Surgeon.

To Commissioner HERCHMER,
North-West Mounted Police,
Regina.

Forwarded,
A. BOWEN PERRY,
Superintendent, Commanding "F" Division.

NORTH-WEST MOUNTED POLICE.

ANNUAL Sick Report from 30th Nov., 1885, to 30th Nov., 1886.

Disease.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.
Fracture.....	1	82	82	Fracture of radius. From frost bites.
Amputation of toes.....	1	89	89	
Dislocation.....	1	22	22	
Rheumatism, acute.....	1	13	13	
Rheumatism, muscular.....	30	77	2	
Constipation.....	21	23	1	
Coughs and colic.....	68	112	2	
Contusions.....	13	30	2	
Abrasions.....	3	7	2	
Sprains.....	6	14	2	
Neuralgia.....	10	21	2	
Incised wounds.....	6	23	4	
Biliousness.....	7	7	1	
Diarrhoea.....	36	41	1	
Colic.....	12	21	2	
Pharyngitis.....	13	73	6	
Pleurodynia.....	7	21	3	
Debility.....	8	34	4	
Acne.....	5	6	1	
Nephritis.....	3	5	2	
Onychia.....	2	13	6	
Furuncululus.....	3	5	2	
Epididymitis.....	3	4	1	
Indigestion.....	4	16	4	
Scabies.....	2	9	5	
Eczema.....	2	2	1	
Prurigo.....	1	1	1	
Anthrax.....	1	1	1	
Hives.....	2	2	1	
Frostbite.....	3	3	1	
Tonsillitis.....	2	3	1	
Sciatica.....	2	3	1	
Typho-malarial fever.....	6	102	17	
Intermittent fever.....	1	30	30	
Malaria.....	4	50	12	
Tumour.....	1	2	2	
Hæmorrhoids.....	5	8	1	
Conjunctivitis.....	3	8	3	
Ocephalgia.....	4	5	1	
Oocealgia.....	1	8	8	
Gastralgia.....	1	3	3	
Odontalgia.....	3	3	1	
Otalgia.....	2	13	6	
Urethralgia.....	1	1	1	
Lumbago.....	2	8	4	
Morbus cordis.....	2	4	2	
Hernia.....	1	7	7	
Extraction, dentis.....	1	1	1	
Enlarged tonsils.....	1	1	1	
Bubo (sympathetic).....	2	50	25	
Scald.....	1	1	1	
Pleuro-pneumonia.....	1	77	77	
Ulcers on leg.....	2	2	1	
Varicocoele.....	1	2	2	

HUGH N. BAIN, M.D.,
Acting Surgeon.

APPENDIX W.

ANNUAL REPORT OF ACTING ASSISTANT SURGEON MEWBURN.

LETHBRIDGE, 22nd December, 1886.

SIR,—I have the honour to present you with the following sick report for the year 1886 :—

The health of the men stationed at Lethbridge has, with some exceptions, been excellent. One death is recorded, due to typhoid fever, which was in all probability contracted in Battleford.

I have the honour to be, Sir,

Your obedient servant,

W. H. MEWBURN, M.D.

The Commissioner, N.W.M.P.,
Regina.

NORTH-WEST MOUNTED POLICE.

ANNUAL Sick Report for the Year ending 1886.

Disease.	No. of Cases.	No of Days.	Average Duration.	Surgeon's Remarks.
Injury to hand.....	1	92	92	Returned to duty.
Scarlet fever	2	80	40	do
Bubo	5	153	31	do
Rheumatism	3	75	25	do
Crushed finger	1	7	7	do
Kick from horse	2	22	11	do
Sprained ankle	2	12	6	do
Cold	3	6	2	do
Injury to arm	1	10	1	do
Biliousness	1	2	2	do
Chafe	2	6	3	do
Otalgie	1	3	3	do
Intermittent fever	1	6	6	do
Fracture	2	82	41	do
Typhoid fever	2	36	18	1 case died; 1 case sent to Macleod
Chancreoid	1	15	15	Returned to duty.
Sore ear	1	4	4	do
Conjunctivitis	3	3	1	do
Neuralgia	1	1	1	do
Contusion	2	7	3	do
Debility	5	7	1½	do
Diarrhoea	5	9	2	do
Lumbago	4	6	1½	do
Coryza	2	2	1	do
Bronchitis	3	3	1	do
Dyspepsia	1	1	1	do
Wounded foot	1	1	1	do
Stricture	1	9	9	Under treatment.
Injured spine	1	45	45	Sent to Fort Macleod.

W. H. MEWBURN, M.D.

LETHBRIDGE, 31st December, 1886.

APPENDIX X.

ANNUAL REPORT OF HOSPITAL STEWARD HOLME.

MAPLE CREEK, 4th December, 1886.

SIR,—I have the honor to herewith enclose the annual sick report of "A" Division, for the past year, and I am pleased to state that the health of the troop during this time has been exceptionally good.

On the 1st of the present month the hospital was clear, and not a single man appeared on the sick list; this favorable state of affairs is in part attributable to the healthy occupation in which the majority of the men have been engaged during the summer, viz, detachment patrol duty on the frontier, where they get plenty of fresh and pure water, the latter article being a badly-needed requisite at this Post—in fact, it is the only objection to the locality, which is well situated on a fine dry elevation, and the sanitary surrounding is all that could be desired.

The water in both of the barrack wells is decidedly impregnated with alkali and other highly corrosive mineral deposits, the nature of which is rapidly destructive to all metal utensils with which it comes in contact; it uses up all stove furniture in a few weeks' time, and even decomposes wood; it is also a constant cause of diarrhœa among the men, as you will see by reference to the large percentage of cases on the sick report with that complaint; in fact it is so bad, that a diarrhœa mixture is as necessary to a recruit as any part of his kit—he is not complete or safe without it.

On the eastern side of the creek the water is good at a depth of 16 or 20 feet, but on the west side it is alkali at any depth yet sunk.

It is a notable fact that not a single case of mountain fever has occurred among the men of the troop, while it has prevailed as an epidemic in the village all summer, and that only two miles distant. I have attended over forty cases this past season, and all within a radius of less than half a mile. This fact speaks well for the sanitary condition of the barracks and the soil on which they are built.

At the commencement of the year an epidemic of scarlet fever visited this district. Some twenty odd cases came under my observation, outside of the troop, one man only of the Division being unfortunate enough to contract it. The case was isolated and quarantined in hospital and the spread of the disease thereby prevented.

The only casualties of a serious nature which occurred during the year were those which happened to Sergeant Paterson and Sergeant Smart; the former sustained a gun shot fracture of the thigh and the latter a Potts' fracture of the leg. Both occurred on horseback and were purely accidental. Both cases recovered remarkably well, and in a short space of time, considering the grave nature of the injuries and the intensely hot weather. This is an indication that the atmosphere of this country is conducive to the rapid healing of wounds.

While speaking of these matters, I would beg to direct your attention again to the unworthy condition of the hospital and its inadequacy to withstand the severity of the high winds which prevail here. It is an excellent summer retreat for a patient, but is positively dangerous, in critical cases of illness, in the winter season.

I would also suggest that in view of the increased number of men stationed at Medicine Hat, it will become a necessity to provide a small hospital at that Post for the reception of the sick, as the majority of the cases I have had in the hospital here have been those sent down from Medicine Hat Post, either on account of neglected treatment or none at all. There is more than sufficient furniture, in the way of beds

and mattresses, here to equip the same. The building here has barely ground floor sufficient to set up four (4) beds, and the height of the walls of the ward will not permit of the cubic measurement of air allowance prescribed and necessary for the health and comfort of each individual patient.

I have the honor to be

Your most obedient servant,

J. C. HOLME,
Hospital Steward.

Forwarded.

J. H. McILLREE,
Superintendent.

NORTH-WEST MOUNTED POLICE.
ANNUAL Sick Report for the Year ending 1886.

Disease.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.
Asthma	1	56	56	Returned to headquar- ters, Regina.
Rheumatism	8	80	10	2 do and 6 returned to duty.
Orchitis	1	7	7	do
Sprains	6	42	7	do
Pleuralgia	7	8	1 $\frac{1}{7}$	Medicine and duty.
Pharyngitis	9	14	1 $\frac{5}{9}$	do
Tonsillitis	8	37	4 $\frac{5}{8}$	Returned to duty.
Cephalalgia	5	6	1 $\frac{1}{5}$	Medicine and duty.
Neuralgia	5	7	1 $\frac{4}{5}$	do
Scarlatina, mal	1	30	30	Returned to duty.
Boils	1	1	1	Medicine and duty.
Otitis	1	9	9	Returned to duty.
Palpitation	1	13	13	do
Myalgia	1	1	1	Medicine and duty.
Epilepsy	1	2	2	Returned to Regina.
Conjunctivitis	3	11	3 $\frac{2}{3}$	do duty.
Diarrhoea	33	38	1 $\frac{2}{3}$	Medicine and duty.
Bronchitis	4	8	2	do
Felon	1	11	11	Returned to duty.
Colds	16	20	1 $\frac{1}{4}$	Medicine and duty.
Carbuncle	2	16	8	returned to duty.
Bruises	9	26	2 $\frac{8}{9}$	do
Sciatica	1	1	1	Medicine and duty.
Debility	3	8	2 $\frac{2}{3}$	Returned to duty.
Colic	2	3	1 $\frac{1}{2}$	do
Constipation	1	1	1	Medicine and duty.
Weak eyes	1	3	3	Returned to duty.
Biliousness	3	3	1	Medicine and duty.
Syncope	1	1	1	Returned to duty.
Moultitis	2	2	1	Medicine and duty.
Fracture	2	182	91	Returned to duty.
Wounds	2	21	10 $\frac{1}{2}$	do
Oatarrh	1	1	1	Medicine and duty.
Odontalgia	1	1	1	do
Chafes	2	3	1 $\frac{1}{2}$	do
Dysentery	1	2	2	do
Intermittent fever	1	4	4	Returned to duty.
Onychia	1	1	1	Medicine and duty.
Erythema, nod	2	11	5 $\frac{1}{2}$	Returned to duty.
Dislocation	1	26	26	do
Gastritis	1	2	2	do
Cystitis	1	1	1	Medicine and duty.
Anthrax	1	3	3	do

J. C. HOLME,
Hospital Surgeon.

MAPLE CREEK, 1st December, 1886

APPENDIX Y.

NORTH WEST MOUNTED POLICE.

ANNUAL Sick Report for "B" Division as sent in by Sergeant Hazelton, Wood Mountain.

Disease.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.
Acidity.....	5	10	2	
Apositia.....	1	3	3	
Aaphyxia.....	1	1	1	
Bilious colic.....	6	71	11 ⁵ / ₆	
Biliousness.....	27	46	1 ² / ₃	
Blistered heels.....	2	9	4 ¹ / ₂	
Bronchitis.....	3	15	5	
Bronchoccele.....	1	5	5	
Burn.....	2	10	5	
Catarrh (coryza).....	1	3	3	
Catarrh (bronchial).....	1	6	6	
Catarrh (laryngeal).....	1	6	6	
Cephalalgia.....	5	7	1 ¹ / ₂	
Chapped skin.....	13	37	2 ¹ / ₃	
Chills.....	8	8	1	
Cold.....	10	19	1 ³ / ₁₀	
Cold in chest.....	4	13	2 ¹ / ₄	
Colic.....	13	16	1 ³ / ₄	
Constipation.....	60	83	1 ³ / ₄	
Contusion.....	19	70	3 ¹ / ₂	
Cornu.....	1	8	8	
Cramp.....	24	38	1 ⁷ / ₂	
Deafness (nervous).....	1	7	7	
Debility.....	14	123	8 ¹ / ₄	
Dentagra.....	2	3	1 ¹ / ₂	
Diarrhœa.....	22	26	1 ² / ₁₁	
Dipsomania.....	1	4	4	
Dysentery.....	2	4	2	
Dyspepsia.....	13	35	2 ³ / ₁₃	
Emesis.....	1	2	2	
Ennu.....	3	10	3 ¹ / ₃	
Epilepsy.....	1	4	4	
Flatulence.....	1	1	1	
Frostbite.....	2	11	5 ¹ / ₂	
Furuncle.....	2	10	5	
Gleet.....	1	12	12	
Hæmorrhoids.....	1	3	3	
Influenza.....	6	15	2 ¹ / ₂	
Injury in chest.....	1	5	5	
Insomnia.....	4	4	1	
Lumbago.....	3	8	2 ² / ₃	
Neuralgia.....	5	13	2 ³ / ₅	
Ophthalmia.....	1	3	3	
Pain in back.....	1	9	9	
Palpitation (chronic).....	1	51	51	
Pharyngitis.....	6	18	3	
Poisoned hand.....	1	9	9	
Psoriasis.....	1	24	24	
Rhenmatism (articular).....	4	17	4 ¹ / ₄	
Rheumatism (muscular).....	14	68	4 ¹ / ₂	
Saddle chafe.....	5	6	1 ¹ / ₅	

ANNUAL Sick Report for " B " Division, &c.—*Concluded.*

Disease.	Number of Cases.	Number of Days.	Average Duration.	Surgeon's Remarks.
Scrofulous swelling	1	38	38	
Spasm	1	$\frac{1}{2}$	$\frac{1}{2}$	
Sprain	1	4	4	
Strain in back	3	25	$8\frac{1}{3}$	
Sunburn	3	8	$2\frac{2}{3}$	
Tussis	21	103	$4\frac{1}{2}$	
Urodialysis	3	11	$3\frac{2}{3}$	
Vertigo	4	3	$3\frac{3}{4}$	
Vomiturition	2	$3\frac{1}{2}$	$1\frac{1}{4}$	
Wound in foot	2	10	5	
Wound in hand	2	6	3	

ROBERT HAZELTON,
Hospital Steward " B " Division.

REGINA, N.-W.T., 1st December, 1886.

RECAPITULATION of Cases disposed of in the North-West Territories, from 1st December, 1885, to 30th November, 1886.

Assault	50	Making an illicit still	2
Assault and battery	8	Allowing an illicit still	1
Wife beating	1	Selling intoxicants	74
Murder	1	Selling liquor to Indians	10
Arson	2	Bringing liquor into N.-W.T.	6
Malicious injury to property	2	Non-payment of wages	37
Forgery	8	Deserting employment	13
Felony	1	Trespass	2
Robbery	7	Violating game laws ..	1
Highway robbery	2	Violating license laws	12
Horse stealing	12	Setting fire to prairie	8
Embezzlement	4	Creating disturbance	18
Larceny	32	Unlawful detention of mail	3
Bringing stolen property into Canada	6	Keeping disorderly house	2
Having stolen property in possession	3	Attempt at suicide	1
Obtaining money under false pretences ...	4	Obstructing police	2
Obtaining goods under false pretences	3	Cattle stealing	1
Burglary	8	Threatening to kill	3
House breaking	2	Gambling	10
Misdemeanor	3	Using abusive language	5
Vagrancy	14	Shooting with intent	2
Insanity	9	Shooting at peace officer in discharge of duty	1
Receiving stolen property	5	Obtaining passes under false pretences ...	2
Drunk	49	Travelling on stolen pass	1
Drunk and disorderly	36	Miscellaneous	14
Having liquor in possession	94		
Having in possession an illicit still	5		

APPENDIX AA.

Return of Criminal and other Cases Tried in the North-West Territories, from 1st December, 1885, to 30th November, 1886.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried	By whom Tried
1885.				1885.					
Dec. 9	R-gina	Francis Labelle	Keeping disorderly house	Dec. 9	Fined \$15 and costs	Paid	No.	Medicine Hat	Insp. Norman and Thos. Tweed, J.P.'s.
do 9	do	J. Ferguson	Drunk and disorderly; 2nd offence.	do 9	3 months' hard labour.	.....	do	do	do
do 19	do	Chas. Ross	Having stolen property in his possession and trying to dispose of it.	Jan. 20	.....	Released; insufficient evidence to convict	do	do	Lt.-Col McLeod, S.M.
do 21	do	Jim Wilson	Burglary	do 20	8 months' hard labour.	.....	do	do	do
do 22	do	Eli Adams and B. Thomas.	Complicity in above case	Dec. 22	Case dismissed....	No evidence	do	Maple Creek	Supt. McIlree, J.P
do 26	Jane Adams	Wm. Adams	Using abusive language..	do 28	Released	Plaintiff did not appear.	do	Medicine Hat	Insp. F. Norman and Thos. Tweed, J.P.'s.
do 26	Regina	do	Drunk and disorderly..	do 28	Fined \$10 and costs	.....	do	.....	do
do 26	do	Jno. Montgomery	Selling liquor to Indians	do 29	Cautioned and re-leased.	Insufficient evidence to convict.	No.	Medicine Hat	do
do 26	do	Jas. Ford	Shooting at peace officers in the execution of their duty.	Jan. 20	3 months' hard labour, Regina.	.....	do	do	Col. McLeod, S.M.
1886									
Jan. 18	do	Chas. Diamond ..	Threatening to burn down a house and being drunk.	do 20	Cautioned and dismissed.	.....	do	do	do
Feb. 1	do	Hy. Bertram	Embezzlement	April 8	2 years in Manitoba Penitentiary.	.....	do	do	do
do 9	do	Chas. Beaugils ..	Drunk and disorderly	Feb. 12	1 month's hard labour.	.....	do	do	Thos. Tweed and W. T. Finlay, J.P.'s.
do 12	do	Chas. Ross	Stealing from O. P. R. car at Dunmore.	April 8	3 years in Manitoba Penitentiary.	.....	do	do	Col McLeod, S.M.
do 19	do	Wm. Brooks	Drunk and disorderly	eb. 20	Fined \$10 and costs	.....	do	do	Thos. Tweed and W. T. Finlay, J.P.'s.
Mar. 3	Jno. Nicklison ..	Wm. Warden	Threatening to kill..	Mar. 3	Acquitted	Plaintiff to pay costs.	do	.....	do

APPENDIX A.A.—Return of Criminal and other Cases tried in the North-West Territories—Continued.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried.	By whom Tried.
1886.									
Mar. 3	Regina.....	Jno. Gobbett.....	Petty larceny.....	1886. Mar. 4	Fined \$15 and costs or 2 months' hard labour; bound over to keep the peace for 6 mos., himself in bond of \$100 and 2 surties of \$50 each.	Fine paid.....	No.	Medicine Hat	Thos. Tweed and W. T. Finlay, J.P.s.
do 5	do	Wm. Lanyon.....	Drunkenness.....	do	Fined \$5 and costs or 15 days' hard labour.	Fine not paid.....	do	do	do
do 9	do	F. P. Whitney...	Lunacy	do 10	Committed for safe keeping.	Sent to Manitoba Asylum, 27th April, by order of Lieut.-Governor.	do	do	do
do 15	Louis Haggeyt ..	W. Gardie.....	Assault	do 15	.....	Case dismissed....	do	Maple Creek	Supt. McIlree, J.P.
do 15	Regina.....	Colin Sinclair ...	Malicious injury to property.	do 15	Fined \$15 and costs; to pay \$15 damages or 3 weeks' hard labour.	Fine paid.....	do	do	do
do 15	Mary Smith.....	R. Todd	Attempting to take improper liberties	do 15	Acquitted	Plaintiff to pay costs.	do	Medicine Hat	W. T. Finlay, J.P.
do 19	J. Johnson	W. R. Abbott.....	Injury to sheep done by defendant's dog.	do 19	Defendant to pay costs and destroy dog within 3 days	.....	do	Maple Creek	Supt. McIlree, J.P.
do 26	Regina	Wm. Hayes.....	Drunk and disorderly....	do 27	Fined \$10 and costs	.....	do	Medicine Hat	Thos. Tweed, J.P.
do 27	O. P. Ry. Co	Wm. Smith.....	Malicious injury to property.	do 30	Fined \$20 and costs or 2 months' hard labour.	Fine not paid.....	do	Maple Creek	Supt. McIlree, J.P.
April 1	Regina	Geo. Anderson...	Drunk and disorderly....	April 2	Fined \$5 and costs.	.....	do	Medicine Hat	Thos. Tweed, J.P.
do 1	do	Jno. Lemmon...	do	do 2	Fined \$5 and costs or 10 days' hard labour.	Fine not paid.....	do	do	do
do 20	O. P. Ry. Co	Jno. Scott.....	Obtaining passes under false pretences.	do 22	Acquitted .....	.....	do	do	Thos. Tweed and W. T. Finlay, J.P.s.

April 20	C. P. Ry. Co.	Thos. Stair	Obtaining passes under false pretences.	April 22	.....	Acquitted	No. Medicine Hat	T. Tweed, J.P., and W. T. Finlay, J.P.
do 22	Regina	Geo. Anderson	Drunk and disorderly	do 24	Fined \$10 and costs	.....	do	do
do 24	C. P. Ry. Co.	August Wendt	Leaving employ	do 24	To return to work and pay costs.	.....	do	do
do 24	do	Herman Wendt	do	do 24	do	.....	do	do
do 24	do	Hy. Johnson	do	do 24	do	.....	do	do
do 26	Regina	J. A. McAlpine	Selling intoxicating liquor.	do 26	Fined \$100 & costs	.....	do	do
do 26	do	Horace Reutler	Bringing stolen property into Canada.	May 14	5 years in Stony Mountain Penitentiary.	.....	do	Col. Macleod, S.M., and Supt. McIlree, J.P.
do 26	do	John Wright	do	do 6	Wages and costs to be paid by defendant.	.....	do	do
May 6	F. Phillelan	J. C. A. McRae	Non-payment of wages.	do 6	Contradictory evidence.	.....	do	Thos. Tweed, J.P., and W. T. Finlay, J.P.
do 6	Regina	S. Morgan	Drunk and disorderly	do 7	.....	Dismissed	do	do
do 14	do	W. Cavan	Violating Sunday law	do 15	.....	do	do	do
do 15	do	Aug. Cameron	Forgery	July 7	.....	do	do	Col. Macleod, S.M.
do 18	Anne Morar	P. Smith	Using insulting language	May 19	Warned and dismissed.	.....	do	Thos. Finlay, J.P., and W. T. Finlay, J.P.
June 3	Regina	Pierre Rochlair	Drunk and disorderly	June 3	Fined \$50 and costs	.....	do	Swift Cur- rent.
Aug. 9	do	O. Anderson	do	Aug. 10	do 5	.....	do	Insp. F. Norman, J.P., and W. T. Finlay, J.P.
do 27	do	Jno. Phillips	do	do 27	Fined \$5 or one week's hard labor	.....	do	Maple Creek Supt. McIlree, J.P.
Sept. 2	do	Chas. Webster	Obtaining goods under false pretences.	.....	.....	Case settled out of court.	do	Insp. Norman, J.P.
do 4	do	Jas. Little	Drunk and disorderly	Sept. 6	Fined \$3 and costs	.....	do	Medicine Hat Insp. Norman, J.P., and W. T. Finlay, J.P.
Oct. 14	do	Jno. Endahl	Obtaining money under false pretences.	Nov. 12	.....	Insufficient evidence	do	Maple Creek Col. Macleod, S.M., and Supt. McIlree, J.P.
do 28	do	T. P. Killeen	Lunacy	do 12	.....	Sent to Selkirk Asylum Nov. 13th by order of Lt. Gov.	do	Supt. McIlree, J.P.
do 29	do	Frank Nearing	Indecent assault	Oct. 30	Given 24 hours to leave town.	Insufficient evidence to convict	do	Medicine Hat Insp. Norman, J.P., and Thos. Tweed, J.P.
Nov. 19	do	Chas. Pomeroy	Setting fire to prairie	Nov. 19	Fined \$0 and costs or one month's imprisonment.	Fine not paid	do	Maple Creek Supt. McIlree, J.P.
do 29	C. P. Ry. Co.	F. McArthur	Travelling on a stolen pass.	do 29	To pay fare from Donald to Medicine Hat.	Fare paid	do	Medicine Hat Insp. Norman, J.P.
do 28	Regina	J. H. McCarthy	Vagrancy	do 30	Confined until noon train, Dec. 1st.	.....	do	Insp. Norman, J.P., and Thos. Tweed, J.P.

APPENDIX AA.—Return of Criminal and other cases tried in the North-West Territories—Continued.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If tried by Jury.	Where Tried.	By whom Tried.
1885.				1885					
Dec. 17	Const. McGregor	O. Romaine	Drunk	Dec. 17	Fined \$15 and costs		No.	Moose Jaw	M. Bouge, J.P.
do 22	Corpl. Curry	Wm. Leckey	Having intoxicants in possession.	do 22	do 200		do	Broadview	H. Richardson, S.M.
do 24	Geo. Hudson	W. T. Crisp	Maliciously killing a dog	do 28	do 5		do	Moosomin	E. Brovkoski, J.P.
1886.				1886					
Jan. 6	The Queen	John Wilson	Having liquor in possession	Jan. 6	Dismissed		do	Regina	H. Richardson, S.M.
do 6	— West	— Knapper	Assault	do 6	do		do	do	do
do 18	The Queen	Jas. Irvine	Embezzlement	do 19	do		do	do	do
do 12	Bailing Thunder	— Mitchell	Misdemeanor	do 12	1 month hard labor		do	do	do
do 2	Corpl. Curry	F. Kaplonck	Vagrancy	do 2	2 months' imprisonment.		do	Broadview	Thos. Evans, J.P.
do 26	Ok-we-we-kah	Jos. Morrison	Assault	do 26	15 and costs		do	do	do
do 12	The Queen	Jas. Thompson	Unlawful detention of mail bag.	do 13	Fined \$1 and costs		do	Moosomin	E. Brovkoski, J.P.
do 12	do	Stewart Thompson	do	do 13	do 1		do	do	do
do 12	do	John Thompson	do	do 13	do 1		do	do	do
do 16	J. Campbell	J. Brennan	Malicious injury to property.	do 18	Dismissed		do	do	do
Feb. 16	F. Guyot	Wm. Ruat	Assault and battery	Feb. 16	Fined \$10 and costs		do	Moose Jaw	R. S. Alexander, J.P.
do 21	M. de Lowry	David Morris	do	do 24	do 2		do	Fort Qu'Appelle.	S. Cruthers, J.P.
March 1	The Queen	Peter Oster	Horse stealing	March 1	2 years in penitentiary.		Yes.	Regina	H. Richardson, S.M.
do 22	do	A. McDonald	Larceny	do 22	1 month hard labor		No.	do	do
do 18	A. G. Thorburn	J. Raymond	Receiving stolen property	do 18	Dismissed		do	Broadview	Thos. Evans, J.P.
do 18	Wm. McLeod	Joseph Smith	Having liquor without permit.	do 13	Fined \$200 or 6 months.		do	do	do
do 13	do	Jno. Russell	do	do 13	Dismissed		do	do	do
April 13	The Queen	J. Dillon	Having in possession a whiskey still.	April 13	2 months hard labor or \$400.		do	do	H. Richardson, S.M.
do 13	do	A. Wymer	do	do 13	1 month hard labor or \$100.		do	do	do
do 13	do	John Russell	do	do 13	3 months hard labor		do	do	do

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APPENDIX A.A.—Return of Criminal and other Cases tried in the North-West Territories—Continued.

Date of Arrest or Committal.	Prosecutor.	Defendant.	Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried.	By whom Tried.
1886.				1886.					
June 14	The Queen	Donald McDiarmid	Selling whiskey	June 14	Fined \$50 and costs	.....	No.	Wapella	J. J. Butler, J.P.
do 24	J. Tingle	King	Larceny	do 24	.....	Committed for trial	do	Whitewood	Lyons, J.P.
do 12	Sergt. Fyffe	Paul Christenson	Fighting	do 12	.....	Discharged	do	Qu'Appelle	G. S. Davidson, J.P.
do 19	do	Mat. Milne	Selling whiskey	do 19	Fined \$200 or 6 months	.....	do	do	do
do 19	do	O. Martin	do	do 19	.....	Discharged	do	do	do
do 24	Jas Watt	Wm. Mullan	Assault	do 23	Fined \$5 and costs	.....	do	do	do
July 2	The Queen	J. A. Stewart	Attempt at suicide	July 2	.....	Discharged	do	Regina	H. Richardson, S.M.
do 2	Thos. Simmons	Joseph Bouville	Drunk	do 2	.....	Discharged	do	Qu'Appelle	S. Oruthers, J.P.
do 5	R. Lee	Donald Green	do	do 5	Fined \$1 and costs	.....	do	do	do
do 3	do	Thos. Hutton	Swearing	do 3	do \$5	.....	do	do	do
do 5	M. A. Macpherson	Wm. Wilson	Non-payment of wages	do 5	Ordered to pay	.....	do	do	do
do 8	R. Lee	John B. Burr	Swearing	do 8	Fined \$10 and costs	.....	do	do	do
do 5	Corpl. Curry	T. Simpson	Having liquor in possession	do 5	do 50	.....	do	Broadview	Thos Evans, J.P.
do 6	J. Balltell	M. Miller	Assault	do 13	do 5	.....	do	Moose Jaw	R. L. Alexander.
do 27	The Queen	Geo. Knight	Shooting prairie chickens out of season	do 31	do 5	.....	do	do	do
do 2	do	Thos. Gillman	Having liquor in possession	do 2	do 50	.....	do	Moosomin	E. Brokovski, J.P.
do 16	do	Wm. Scoville	Burglary	do 16	.....	Dismissed	do	do	do
do 17	do	Louis O'Soup	Drunk	do 19	.....	do	do	do	do
do 19	do	Keake & Brooks	Setting fire to the prairie	do 28	.....	do	do	do	do
do 29	Rebecca Kady	D. Gulgaia	Assault	do 29	Fined \$5 and costs	.....	do	do	do
do 30	The Queen	Philip Cook	Importing liquor into the N.W. Territories	do 30	do 100	.....	do	do	do
do 9	David Good	W. R. Bell	Non-payment of wages	do 16	To pay wages due	.....	do	Qu'Appelle	G. S. Davidson.
do 9	G. Beach	do	do	do 16	.....	Judgment reserved	do	do	do
do 17	J. Kennedy	do	Larceny	do 16	.....	do	do	Regina	H. Richardson, S.M.
do 17	do	McKenzie	do	Aug. 12	3 mos. hard labor	.....	do	Fort Qu'Appelle	R. R. Smith, J.P.
do 20	Thos. Williams	R. Balfour	Assault and battery	do 20	Discharged	do	do	do
do 20	do	Wm. Johnston	do	do 20	do	do	do	do
do 20	do	Geo. Craig	do	do 20	do	do	do	do

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APPENDIX AA.—Return of Criminal and other cases tried in the North-West Territories—Continued.

Date of Arrest or Committal.	Prosecutor.	Defendant.	Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried.	By whom Tried.
1886.				1886.					
Aug. 22	The Queen	Robert Boyer	Drunk.	Aug. 26	Fined \$1 and costs	Dismissed	....	Moosomin	E. Brokooski, J.P.
do 25	do	W. P. McCormack.	Creating a disturbance on the streets of Regina.	Sept. 2	....	do	....	Regina	H. Richardson, S.M.
do 25	do	Thos. E. Martin.	Creating a disturbance in the streets of Regina.	do 2	....	do	No.	do	H. Richardson, S.M.
do 25	do	Chas. H. Bain.	do	do 2	....	do	do	do	do
do 25	do	— Crickshank.	do	do 2	....	do	do	do	do
do 25	do	G. H. Bergin.	do	do 2	....	do	do	do	do
Sept. 11	do	Jas. Levesque	Highway robbery	Oct. 7	14 years in penitentiary.	....	Yes	Regina	do
do 11	do	Geo. L. Garnett.	....	....	....	....	....	....	....
do 2	Joseph Beauville	O. W. Evans	Assault	Sept. 3	....	Dismissed	No.	Qu'Appelle	G. S. Davidson, J.P.
do 3	do	do	Threatening to kill	do 3	Bound over to keep the peace.	....	do	do	do
do 28	Const. Baker	R. Boyd	Unlicensed billiard table.	do 3	Fined \$40 and costs	....	do	do	A. McLean, J.P.
do 7	John Thompson.	Joe Bishop	Larceny	do 7	1 month hard labor	....	do	Regina	H. Richardson, S.M.
do 24	The Queen	Simeon Cook	Having liquor illegally	do 24	Fined \$50 and costs	....	do	Broadview	Thos. Evans, J.P.
do 1	do	Geo. McAuley	Cruelty to animals	do 1	do 5 do	....	do	Moosomin	E. Brokovski, J.P.
do 14	do	A. McLaughlin.	Larceny	do 14	....	Dismissed	do	do	do
do 13	do	J. Bruce	Practicing medicine without license.	do 13	Fined \$1 and costs	....	do	do	J. Buller, J.P.
do 27	do	J. J. Emanuel	Unlicensed billiard table	do 27	....	Dismissed	do	do	E. Brokovski, J.P.
do 2	Const. Jackson	M. O. Corrigan	Gambling	do 2	Fined \$2 and costs	....	do	Whitewood	J. G. Lyons, J.P.
do 2	do	H. Gibson	do	do 2	do 2 do	....	do	do	do
do 2	do	O. Street	do	do 2	do 2 do	....	do	do	do
do 1	do	C. K. Hague	Unlicensed billiard table	do 1	do 40 do	....	do	do	Wm. Logan, J.P.
do 3	Wm. R. Tyms	A. G. Ward	Obtaining money under false pretences.	do 3	....	Dismissed	do	do	J. G. Lyons, J.P.
do 11	D. Campbell	H. Messenger	Assault	do 2	....	do	do	do	do
Oct. 2	The Queen	F. Moyers	do	Oct. 2	....	Sentence deferred.	do	Regina	H. Richardson, S.M.
do 30	do	Geo. Francis	Larceny	do 30	....	Pleaded guilty; discharged.	do	do	do
do 30	do	A. G. Nicolls	do	do 30	....	do	do	do	do
do 30	do	B. Levy	Selling intoxicants	do 30	Fined \$200 & costs	Fine paid in Wm. p. g.	do	do	do

do	28	Corpl. Bloomfield	Louis Gorvish...	Drunk.....	do	29	do	2	do	.....	do	Port Qu'Appelle.	S. Cruthers, J.P.
do	do	28	Const. Guernsey	Jas. Bangs.....	do	do	do	2	do	.....	do	do	S. R. Smith, J.P.
do	do	9	Mrs. McDonald	A. McDonald.....	Larceny.....	do	do	2	do	.....	do	Qu'Appelle.	J. Harvey, J.P.
do	do	9	do	do	Threatening to kill	do	do	9	Bound over to keep the peace.	.....	do	do	do
do	do	2	Bucksahot (Indian)	Blue Balls.....	Assault.....	do	do	4	1 month hard labor	.....	do	Broadview...	Thos. Evans, J.P.
do	do	6	The Queen	J. Agnew.....	Setting fire to the prairie	do	do	7	.....	.....	do	Moosomin	E. Brokowski, J.P.
do	do	2	do	Robert Marling.....	do	do	do	7	.....	.....	do	Whitewood.....	do
do	do	16	J. G. Lyons	Wm. Johnston.....	Stealing a waggon.....	do	do	7	.....	.....	do	do	do
do	do	16	do	H. Doran.....	do	do	do	7	.....	.....	do	do	do
do	do	2	Const. Jackson.....	M. O. Corrigan.....	Assault.....	do	do	2	Fined \$15 and costs	.....	do	do	O. Marshall, J.P.
do	do	8	C. Marshall, J.P.	Wm. Nicoll.....	Setting fire to the prairie	do	do	8	do 15 do	.....	do	do	J. Wilson, J.P.
do	do	20	Const. Hopper.....	Joseph Boom.....	do	do	do	8	.....	.....	do	do	J. G. Lyons, J.P.
Nov.	do	20	Thos. Hinton	W. Emard.....	Assault and battery	Nov.	do	10	Discharged.....	Prosecutor to pay costs.	do	Qu'Appelle.	G. S. Davidson.
do	do	10	The Queen.....	Thos Hinton	Contempt of court.....	do	do	10	Fined \$5	.....	do	do	do
do	do	10	Const. Baker.....	do	Drunk.....	do	do	11	.....	Discharged.	do	do	do
do	do	26	The Queen	Chas. McDougall	Having intoxicating liquors in possession.	do	do	11	.....	Not yet disposed of	do	Regina.....	S. Gagnon, J.P.
do	do	4	F. Walsh.....	E. Coalpitt.....	Carting without a license	do	do	6	Fined \$5 and costs	.....	do	Moose Jaw.....	E. Ross, J.P.
do	do	1	Corpl. Curry	Wm. Hammond.....	Drunk.....	do	do	1	do 4 do	.....	do	Broadview...	Thos. Evans.
do	do	6	The Queen	Frank O'Cooney	Burglary.....	do	do	6	.....	Discharged.	do	Moosomin	E. Brokowski, J.P.
do	do	13	— McDonald	— McDonald.....	Assault.....	do	do	16	Fined \$1 and costs	.....	do	Pipestone Settlement	F. Beaton, J.P.
do	do	16	The Queen.....	Robt. Lynas.....	Drunk.....	do	do	16	do 10 do	.....	do	Wapella.....	J. G. Lyons, J.P.
do	do	9	do	M. Rutlan.....	Cruelty to animals.....	do	do	9	do 30 do	.....	do	Regina.....	H. Richardson, S.M.
do	do	9	do	Jno. O'Flynn.....	do	do	do	9	do 30 do	.....	do	do	do
do	do	4	do	Wm. McDonald.....	Feliciously killing cattle	do	do	.....	.....	Sent for trial to Prince Albert.	do	do	do
do	do	16	do	J. W. Powers.....	Assault.....	do	do	16	Fined \$2 and costs	.....	do	Regina.....	Hy. Lejeune, J.P.
do	do	3	M. Lambert.....	Leon Weault.....	Abusive language.....	do	do	.....	.....	Settled out of court	do	do	do
do	do	11	Corpl. Bloomfield	Arthur Roberts.....	Drunk.....	do	do	12	2 months hard labor.	.....	do	Port Qu'Appelle	S. Cruthers, J.P.
do	do	11	do	do	Swearing.....	do	do	12	Fined \$10	.....	do	do	do
Feb.	do	2	Regina.....	P. Flannwood.....	Felony.....	Mar.	do	16	Committed for trial	.....	do	Bathford	Supts Steele and Macdonell.
do	do	4	P. Hamond.....	C. Goff.....	Assault.....	Feb.	do	4	Fined \$15 or 1 month hard labor	.....	do	do	do
do	do	5	W. C. Nuan.....	M. Smith.....	Using insulting language	do	do	6	do	.....	do	do	do
do	do	4	Regina.....	D. Ross.....	Drunk and disorderly	do	do	4	Fined \$25 and costs or 3 months hard labor.	.....	do	do	do
do	do	10	do	L. Caplette.....	do	do	do	10	Fined \$15 and costs or 2 months hard labor.	.....	do	do	do
do	do	10	do	J. Willis.....	do	do	do	10	Fined \$10 and costs or 1 month hard labor.	.....	do	do	do

APPENDIX A.A.—RETURN of Criminal and other Cases tried in the North-West Territories, &c.—Continued.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried.	By whom Tried.
1886.				1886.					
Mar. 16	M. Lauzon.....	A. Miller	Refusal to pay wages.....	Mar. 17	Dismissed with costs.	Fine paid	No.	Battleford ...	Supt. Steele and Macdonell.
do 23	Regina	J. Stevenson	Felony.....	do 23	Committed for trial.	.....	do	do	do
do 25	do	T. Stevenson	do	Apr. 22	do .....	.....	do	do	do
April 12	do	J. Daniels	Drunk and disorderly and keeping house of ill-fame.	do 12	Fined \$60 and costs or 3 months hard labor.	Fine not paid.....	do	do	do
May 12	do	do	Attempt to escape	May 12	10 days imprisonment, hard labor or 1 month hard labor.	.....	do	do	do
do 27	do	J. Todd	Drunk and disorderly.....	do 27	Fined \$15 and costs or 1 month hard labor.	Fine paid	do	do	do
do 27	do	D. Keith	do	do 27	do \$20 do ..	do	do	do	do
do 27	do	do	Assault	do 28	do 15 do ..	do	do	do	do
June 15	do	M. McLaughlin ..	Drunk and disorderly ..	do 15	do 15 do ..	do	do	do	do
July 9	do	F. Hardie	do	July 9	do 5 do ..	do	do	do	do
do 9	do	W. Todd	do	do 12	do 5 do ..	do	do	do	do
do 12	do	G. J. Olinck	Refusal to pay wages ..	do 13	Ordered to pay wages	do	do	do	do
do 12	J. C. Bridgman..	J. O. Billiveau ..	Selling intoxicating liquor.	do 12	Fined \$50 and costs or 2 months hard labor.	do	do	do	do
do 12	Regina.....	A. Boyle.....	do	do 12	do	do	do	do	do
do 13	do	J. E. Billiveau ..	do	do 13	Dismissed	Insufficient evidence.	do	do	do
do 13	do	C. O. Baker	do	do 13	Fined \$50 and costs or 2 months hard labor.	Fine paid	do	do	do
Aug. 13	do	J. A. Fraser	Felony	Aug. 14	Committed for trial.	.....	do	do	do
do 13	do	S. Warden	do	do 14	do .....	.....	do	do	do
do 23	A. Berthiaume ..	J. Oliver	Assault	do 23	Settled out of court.	.....	do	do	do
Sept. 21	H. Sikes	G. Leeson	Refusal to pay wages ..	Sept. 21	do .....	.....	do	do	do
Oct. 14	Regina	D. Cowan	Selling intoxicating liquor.	.....	.....	Insufficient evidence.	do	do	do
do 14	do	J. Pronquas.....	do .....	.....	.....	do	do	do	do

APPENDIX A.A.—Return of Criminal and other cases tried in the North-West Territories—Continued.

Date of Arrest or Committal.	Prosecutor	Defendant.	Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried	By whom Tried.
1886.				1886.					
Jan. 7	Harris	Ramsay	Non-payment of wages...	Jan. 8	Ordered to pay wages.			Calgary	W. M. Herchmer, J.P.
do 9	F. Baker	J. Bremner	do	do 9	Ordered to pay wages, \$27.76, by 11th inst.			do	do
do 14	J. Rogers	D. Hamilton	Non-payment of wages...	do 14	Claimed \$28, allowed \$9.			do	W. M. Herchmer, J.P.
do 16	Regina	A. McLean	Liquor on premises	do 16	\$200 and costs or 6 months imprisonment, hard labor, to be paid by 10 a.m., on 23rd inst.			do	do
do 20	H. Swaffer	Hamblay and Jordan	Non-payment of wages...	do 20	Allowed \$12, to pay \$10 on 23rd, \$10 on 30th and balance 7th Feb			do	do
do 20	J. Hope	do	do	do 20	Allowed \$44 52, to pay \$10 on 21st, \$10 on 30th, and balance 7th Feb			do	do
do 23	Regina	W. Hammond	Liquor illegally in possession.	do 25	\$200 and costs or 6 months imprisonment, hard labor			do	do
do 28	do	H. McLeod	do	do 25	Case dismissed			do	do
do 23	do	R. Brown	do	do 25	do			do	do
do 26	do	Jas. R.illy and A. F. Martin	Liquor illegally on premises.	do 28	do			do	do
do 28	do	M. Harper	Liquor illegally in possession on 26th.	do 28	Fined \$200 and costs or 6 months imprisonment, hard labor, to be paid by 5th Feb.			do	do
Feb. 3	do	George Murdoch and Jas. Reilly	Creating a disturbance on public highway.	Feb. 3	Each bound over to keep the peace.			do	do

do	do	J. Ingram	Assault	do	8	for 6 months.	.....	do	.....	do	.....	do	.....	Dr. Henderson, J.P.
do	do	D. R. Clarke and D. McKenzie.	Non-payment of wages...	do	9	Ordered to pay \$2.50.	.....	do	.....	do	.....	do	.....	Maj. Walker, J.P., and Dr. Henderson, J.P.
do	do	Thos. Keyes and Neil McRae.....	Theft.	do	13	Acquitted, .....	.....	do	.....	do	.....	do	.....	.....
do	do	.....	Drunk and creating a disturbance.	do	20	\$15 and costs or 10 days hard labor.	.....	do	.....	do	.....	do	.....	.....
do	do	D. McDonald.....	do	do	20	\$10 or 10 days hard labor.	.....	do	.....	do	.....	do	.....	.....
do	do	D. McGillis.....	do	do	20	\$10 and costs or 10 days hard labor	.....	do	.....	do	.....	do	.....	.....
do	do	do	Refusing to give informa- tion to police as to where he obtained li- quor.	do	20	\$50 or 2 months, hard labor.	.....	do	.....	do	.....	do	.....	.....
do	do	Wm. Clarke.....	Assault	do	20	1 month, hard labor	.....	do	.....	do	.....	do	.....	.....
do	do	J. Spence.....	Creating a disturbance...	do	20	Acquitted .....	.....	do	.....	do	.....	do	.....	W. M. Herchmer, J.P.
do	do	J. Beaudoin.....	Liquor on premises	do	23	Case dismissed ..	.....	do	.....	do	.....	do	.....	.....
do	do	A. McLean.....	do	do	23	do	.....	do	.....	do	.....	do	.....	.....
do	do	O. H. Folger.....	do	do	23	do	.....	do	.....	do	.....	do	.....	.....
do	do	Niebergall.....	Liquor illegally on pre- mises.	do	24	do	.....	do	.....	do	.....	do	.....	.....
do	do	J. Lewis.....	Dangerous lunatic	do	25	do	.....	do	.....	do	.....	do	.....	.....
do	do	J. Johnston.	Liquor in possession.	do	25	do	.....	do	.....	do	.....	do	.....	.....
do	do	O. Lafferty.....	do	do	24	\$300 and costs or 6 months, hard labor.	.....	do	.....	do	.....	do	.....	.....
do	do	J. Young.....	do	do	do	do	.....	do	.....	do	.....	do	.....	.....
Mar.	9	J. Beaudoin.....	Liquor illegally in posses- sion.	Mar.	9	\$300 and costs, if not paid by 25th March, 6 months imprisonment, hard labor.	.....	do	.....	do	.....	do	.....	J. Travis, S.M.
do	do	H. Manny.....	Larceny	do	23	2 years imprison- ment, Manitoba Penitentiary.	.....	do	.....	do	.....	do	.....	.....
do	do	D. McNeil	Selling liquor.....	do	10	\$300 and costs or 6 months, hard labor.	.....	do	.....	do	.....	do	.....	W. M. Herchmer, J.P.
do	do	J. Sullivan	Larceny	do	24	3 years imprison- ment, Manitoba Penitentiary.	.....	do	.....	do	.....	do	.....	J. Travis, S.M.
do	do	W. Whitbeck.....	Receiving stolen property	do	24	1 year imprison- ment, hard labor	.....	do	.....	do	.....	do	.....	.....
do	do	J. Reilly.....	Selling liquor.....	do	15	Dismissed .....	.....	do	.....	do	.....	do	.....	W. M. Herchmer, J.P.
do	do	J. McDonagh....	Receiving stolen property	do	26	1 year imprison- ment, hard labor	.....	do	.....	do	.....	do	.....	J. Travis, S.M.

APPENDIX A.A.—RETURN of Criminal and other Cases Tried in the North-West Territories, &c.—Continued.

Date of Arrest or Committal.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried.	By whom Tried.
1886.									
Mar. 17	Regina	O. O. McKay	Importing 300 gallons liquor into Territories.	Mar. 18	Fined \$200 and costs or 6 months imprisonment, hard labor. Liquor split.	Fine paid .....	.....	Calgary	W. M. Herchmer, J.P.
do 17	do	J. McKay	do	do 18	Fined \$200 and costs or 6 months hard labor.	Paid, 24th .....	.....	do	do
do 17	do	W. Faust	Assisting McKay Bros. to bring liquor from ear at Lang ion to Calgary	do 18	do	do .....	.....	do	do
do 17	do	Wm. Barnett	do	do 18	do	Paid \$150 on 30th March, given to the balance.	.....	do	do
do 25	do	W Kane	Larceny	May 12	6 months imprisonment, hard labor	.....	.....	do	O. B. Rouleau, S.M.
do 25	do	J. Bertrand	do	do 12	do .....	.....	.....	do	do
April 6	do	Neil McLeod	Drunk in the public streets, Calgary.	April 7	Fined \$10 & costs, in default, 14 days hard labor.	Fine paid	No	do	Dr. A. Henderson and J. D. Moodie, J.P.'s.
do 14	C. P. R. Co.	James Haggard and A. Atken.	Absenting themselves from their employment.	do 14	Case dismissed on agreeing to go to work.	do	do	do	J. D. Moodie, J.P.
do 16	Henry Atkinson.	Alexis (Indian).	Shooting at H. Atkinson, with intent to do him bodily harm.	May 11	2 months imprisonment, hard labor.	do	do	do	O. B. Rouleau, S.M.
do 20	Regina	Billy Rorke, Brewster and F.W. Fournier.	Vagrancy	April 20	Dismissed on condition they leave town by April 25	do	do	do	J. D. Moodie and Geo A. Simpson, J.P.'s.
do 21	do	Albert Carey	Illegally selling liquor.	.....	Fined \$200 & costs in default, 6 mos hard labor.	do	do	do	J. D. Moodie, J.P.
do 21	do	A. Haldimand	do	April 21	do	do	do	do	do
do 19	John Hughes	Jos. W. Vaughan.	Non-payment of wages.	do 21	Defendant to pay	do	do	do	do

do	21	Regina	Hugh McLeod....	Illegally selling liquor ...	do	21	Fined \$200 & costs, and 22	do	.....	do	.....	do
do	21	do	Richard Brown..	do	April 22	Case dismissed, and warrants is- sued for Neil Mc- Kee, proprietor of J X L saloon. or 3 months im- prisonment hard labor.	do	.....	do	.....	do	do
do	24	do	George Tucker ..	Liquor illegally in pos- session.	do	24	Fined \$100 & costs, or 3 months im- prisonment hard labor.	do	.....	do	.....	W. D. Antrobus, J.P.
do	28	do	Howard Douglas	Importing intoxicating li- quor into N.W.T.	do	28	Fined \$100 & costs, or 6 months im- prisonment, hard labor.	do	.....	do	.....	do
do	29	do	J. D. Moulton....	Having intoxicated li- quor on premises.	May 1	Fined \$100 & costs, or 3 months im- prisonment, hard labor; notice of appeal at Dec. sittings of court.	do	.....	do	.....	do	J. D. Moodie, J.P.
May	10	A. Stirrett.....	J. Benot.	House breaking .....	.....	Dismissing, the pro- secutor not ap- pearing.	No.	Calgary	W. D. Antrobus, J.P.	do	.....	do
do	8	David Grass....	M. McKellar	Obtaining horse under false pretences.	May 8	Case dismissed on McKellar agreeing to return horse.	do	.....	do	.....	do	do
do	10	Regina	David Hastie	Larceny	do	12	2 months' impris- onment with hard labor.	do	.....	do	.....	O. B. Rouleau, S.M.
do	13	do	David McIntyre..	Drunk ..	do	14	Fined \$20 & \$2.25 costs or 1 month's imprisonment with hard labor.	Fine and costs paid	do	.....	do	W. M. Herchmer and J. D. Moodie, J.P.'s.
do	14	do	John Campbell ..	Drunk on the public streets.	do	15	Acquitted	do	.....	do	.....	do
do	20	do	Ed. Donohue	Liquor illegally in pos- session.	do	20	Fined \$200 and costs or 6 months' imprisonment with hard labor.	Fine paid	do	.....	do	W. D. Antrobus, J.P.
do	23	O. P. R. Co.....	O. King, James Gilluth and David Gilluth.	Deserting their employ- ment.	do	23	Case dismissed on men agreeing to return to work.	do	.....	do	.....	do

APPENDIX A.A.—Return of Criminal and other Cases Tried in the North West Territories, &c.—Continued.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	Where Tried by Jury	Where Tried	By Whom Tried.
1886.									
May 22	Regina	Francis Donohue	Assault	May 2 1886.	Fined \$1 and costs or 10 days' imprisonment	Fine paid.	No.	Calgary	W. D. Antrobus, J.P.
do 31	do	A. Campbell ...	Drunk	do 31	Dismissed with a caution.	.....	do	do	W. D. Antrobus and A. Henderson, J.P's.
do 27	T. Gilbert	J. O. M. Davis...	Non-payment of wages...	do 27	Jesse dismissed on Davis agreeing to pay Gilbert on the 31st May, 1886.	.....	do	do	W. D. Antrobus, J.P.
June 3	Regina	Patrick McAfee.	Drunk	June 3	Dismissed in consideration of previous good conduct, and promising to go to Mountains.	.....	do	do	W. D. Antrobus and A. Henderson, J.P's.
do 1	M. Demsey and Dennis Shea.	Geo. Murdoch...	Non-payment of wages...	do 1	Dismissed without costs.	.....	do	do	W. D. Antrobus, J.P.
do 14	Regina	P. O. Hurlburt...	Created a disturbance in the town of Calgary by firing off a revolver.	do 24	Fined \$1 and costs or 14 days' imprisonment with hard labor.	Fine paid	do	do	W. M. Herchmer and W. D. Antrobus, J.P's.
do 16	C. P. R. Co.....	Wm. Smith and Jos. Boulette	Deserting their employment.	do 16	Wm. Smith fined \$90 and costs or 31 days' imprisonment.	Fine not paid	do	do	W. D. Antrobus, J.P.
June 16	P. O. Hurlburt...	D. R. Clarke	Non-payment of wages...	June 16	Defendant to pay wages and costs or 1 month imprisonment.	Wages and costs paid.	do	do	W. D. Antrobus, J.P.
do 16	Regina	A. Carey.	Selling liquor	do 16	Dismissed for want of sufficient evidence.	.....	do	do	do

do	16	do	S. Blake.....	Creating disturbance and damaging property.	do	17	Fined \$30 and costs; and \$5 damages, or 6 months im- prisonment with hard labor	Fine, costs and damages paid.	do	do	W. M. Herchmer, and W. D. Antrobus, J.P.'s.
do	16	do	Ed Barnett....	Assisting prisoners to es- cape.	do	16	Case dismissed for want of sufficient evidence.	.....	do	do	do
do	16	do	John Wilson.....	Liquor illegally in posses- sion.	do	16	Fined \$200 and costs or 6 months imprisonment with hard labor.	Fine not paid.....	do	do	W. D. Antrobus, J.P.
do	16	do	J. G. M. Davies.	Non-payment of wages...	do	17	Fined \$200 & costs or 6 months im- prisonment with hard labor.	.....	do	do	Settled out of Court. W. D. Antrobus, J.P.
do	17	do	W. P. Walsh.....	Liquor illegally in posses- sion.	June	17	Fined \$50 and costs or 12 months im- prisonment with hard labor.	Fine paid.....	do	do	do
do	17	do	Jas. Caldwell....	do	do	17	do	do	do	do	do
do	17	do	D. McIntyre.....	do	do	17	do	Fine not paid.....	do	do	do
do	18	do	F. W. Lowe.....	do	do	19	do	Fine paid.....	do	do	do
July	2	do	A. Thomas.....	Drunk.....	July	2	Fined \$5 and costs or 14 days im- prisonment with hard labor.	do	do	do	W. M. Herchmer and W. D. Antrobus, J.P.'s.
do	2	do	D. Carter.....	do	do	2	do	do	do	do	do
do	2	do	W. Bradley.....	do	do	2	do	do	do	do	do
do	2	do	J. Nicholson.....	do	do	2	Fined \$10 and costs or 21 days im- prisonment with hard labor.	do	do	do	do
do	2	do	W. Parsons.....	do	do	2	Fined \$5 and costs or 14 days im- prisonment with hard labor.	do	do	do	do
do	2	do	F. Cutting.....	do	do	2	Dismissed.....	.....	do	do	do
do	2	do	D. O. Stewart....	Gambling.....	do	2	Fined \$10 and costs or 21 days im- prisonment.	Fine paid.....	do	do	W. M. Herchmer, J.P.
July	2	Regina	H. Skelton.....	Trespass.....	July	2	Fined \$5 for dam- ages and costs.	Paid.....	No.	Calgary	W. M. Herchmer and W. D. Antrobus, J.P.'s.
do	5	do	O. Preddis.....	Drunk.....	do	5	Fined \$5 and costs or 10 days im- prisonment, hard labor.	Fine paid.....	do	do	A. H. Griesbach and W. D. Antrobus, J.P.'s.
do	9	do	J. H. Christie...	Selling liquor.....	do	9	Case dismissed.....	.....	do	do	W. D. Antrobus, J.P.

APPENDIX AA.—Return of Criminal and other cases tried in the North-West Territories—Continued.

Date of Arrest or Committal.	Prosecutor.	Defendant.	Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried.	By whom Tried.
1886.				1886.					
do 9	Jas. Johnstone.	Liquor in possession between 1st and 28th Feb., 1886.	do 9	Case dismissed for want of evidence	.....	do	do	do
do 10	D. Keefe	Liquor on premises.....	do 10	Fined \$75 and costs or 2 months imprisonment, hard labor.	Fine paid	do	do	do
do 13	G. Livingstone.	Stealing a horse	do 13	Case dismissed .....	.....	do	do	do
do 13	W. O'Brien	Liquor in possession	do 13	Dismissed on proving Dr. Lauderdale issued it for sickness of Mrs O'Brien.	.....	do	do	do
do 17	M. McFarlane	Selling liquor.....	do 17	Fined \$200 & costs or 6 months imprisonment, hard labor.	Fine paid	do	do	W. M. Herchmer, J.P.
do 19	W. Lamont.....	Had in possession, and sold liquor.	do 19	Fined \$100 and \$25.12½ costs or 3 months imprisonment, hard labor.	do	do	do	do
do 19	A. Smith.....	do	do 19	do	Fine not paid.....	do	do	do
do 19	Thos. Fisk.....	Gambling	do 19	Fined \$50 and costs or 2 months imprisonment, hard labor.	Fine paid	do	do	do
do 19	John Scott	Keeping a gambling house.	do 19	do	do	do	do	do
do 19	Jas. Johnston	Selling liquor between 1st and 10th Feb., 1886	do 19	Dismissed for want of evidence.	.....	do	do	W. D. Antrobus, J.P.
do 23	Wm. Lawe	Fighting and creating a disturbance.	do 23	Fined \$5 and costs or 1 month imprisonment, hard labor.	Fine paid	do	do	W. M. Herchmer, J.P.
do 23	John Brennan	do	do 23	do	do	do	do	do

do	24	do	S. Blake.....	Gambling	do	24	Fined \$50 and costs or 3 months imprisonment, hard labor.	do	.....	do	.....	do
do	24	do	Jas. Lytle	do	do	24	do	do	.....	do	.....	do
July	27	Mrs. Fulham ...	Using abusive and insulting language.	do	July	27	do	Case dismissed	No.	Calgary	W. D. Antrobus, J.P.	do
do	29	Regina	Selling liquor.....	do	do	29	Fined \$100 & costs or 4 months imprisonment, hard labor.	Fine paid Aug. 12.	do	do	do	do
do	31	do	M. Woodhouse...	Gambling	do	31	Fined \$50 and costs or 2 months imprisonment, hard labor.	do	.....	do	do	do
Aug.	4	do	Jas. Reilly and A. Martin.	Keeping billiard tables for play without license	Aug.	4	Pay costs and take out license at once.	Costs paid and license taken out.	do	do	W. M. Herchmer, J.P.	do
do	4	do	Wm. Keohan and Geo. Seabury.	do do ..	do	4	do ..	do	...	do	do	do
do	4	do	Pat. McNeil and J. Cummings.	do do ..	do	4	do ..	do	...	do	do	do
do	9	do	Paul Braiser.....	Assault	do	9	Fined \$10 and costs or 15 days imprisonment, hard labor.	Fine paid	do	do	W. D. Antrobus, J.P.	do
do	11	do	Wm. McManis ...	Creating a disturbance...	do	11	Fined \$5 and costs or 10 days imprisonment, hard labor.	do	.....	do	W. D. Antrobus, J.P. and J. D. Moodie, J.P.	do
do	13	J. Wilson	G. Bouchard.....	Non-payment of wages...	do	13	Judgment for plaintiff with costs.	Appeal withdrawn, wages and costs paid.	do	do	J. D. Moodie, J.P.	do
do	11	Regina	Sam. Wilson.....	Creating a disturbance...	do	11	Fined \$5 and costs or 10 days imprisonment, hard labor.	Fine paid	do	do	W. D. Antrobus, J.P. and J. D. Moodie, J.P.	do
do	11	do	Paul Braiser.....	Liquor illegally in possession.	do	11	.....	Case dismissed ...	do	do	W. D. Antrobus, J.P.	do
do	26	do	Wm. Lee	Non-payment of wages...	do	26	Judgment for plaintiff. Amount claimed \$13	\$12 paid into court by defendant.	do	do	J. D. Moodie, J.P.	do
do	26	do	Chapace (Oree Indian).	Drunk	do	26	10 days imprisonment with hard labor.	.....	do	do	W. D. Antrobus, J.P. and J. D. Moodie, J.P.	do
do	26	do	J. Cawthorne....	Selling intoxicating beer.	do	26	Fined \$100 & costs or 5 months imprisonment, hard labor.	To pay on 26th Sept. Fine paid.	do	do	W. D. Antrobus, J.P. W. O. de Ballinhard, J.P.	do

[APPENDIX AA.—RETURN of Criminal and other Cases Tried in the North-West Territories, &c.—Continued.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried	By whom Tried.
1886. Aug. 28	do	Pat. McNeil	Liquor on premises	1886. Aug. 28	Fined \$200 & costs or 3 months imprisonment, hard labor.	Fine paid	No	Calgary	W. D. Antrobus, J.P.
do 26	do	J. Cummings	do	do 28	do	Fine paid. Notice of appeal. Bailed.	do	do	do
do 28	do	do	Selling liquor	do 28	do	do	do	do	do
do 28	Regina.	Hugh McLeod	Selling liquor	do 28	Fined \$400 and costs and 6 months imprisonment, hard labor.	Fined paid. Notice of appeal. Bailed.	do	do	do
do 28	do	J. Donohue	Liquor on premises	do 28	Fined \$200 and costs or 6 months imprisonment, hard labor.	Fine paid	do	do	do
do 28	do	Wm. Fisk	Gambling	do 28	Fined \$50 and costs or 6 months imprisonment, hard labor.	do	do	do	do
do 28	do	John Allan	do	do 28	do	do	do	do	do
do 31	do	R. Broderick	Selling liquor	do 31	Fined \$200 and costs or 6 months imprisonment, hard labor.	do	do	do	do
do 31	do	Frank Fisherman	Obtaining money under false pretences.	Sept 23	Acquitted	do	do	do	C. B. Rouleau, S.M.
Sept. 6	do	Baptiste Touchman.	Drunk	do 6	Fined \$10 and costs or 1 month imprisonment, hard labor.	Fine paid	do	do	W. D. Antrobus, J.P., and Jsa. Walker, J.P.
do 7	do	Martin McDonald	do	do 7	do	do	do	do	W. D. Antrobus, J.P., and J. D. Lafferty, J.P.
do 10	McLean	Wm. Lawn	Non-payment of wages	do 10	Defendant to pay wages, \$49.51, and costs. Notice of appeal. Ap-	Wages, \$49.51, and costs paid.	do	do	W. D. Antrobus, J.P.

do	11	Regina	Jas. Irwin	Assault	do	11	peal thrown out, no jurisdiction. Fine \$2 and costs or 7 days im- prisonment, hard labor. Bound over to keep the peace 6 months.	Fine and costs paid	do	.....	W. M. Herchmer, J.P.
Aug.	26	do	Phil. Barnes	Liquor in possession	Aug.	26	Fined \$100 and costs or 3 months imprisonment, hard labor.	Fine paid	do	.....	W. D. Antrebus, J.P.
Sept.	20	do	Wm. Clarke	Drunk	Sept.	20	Dismissed .....	.....	do	.....	W. D. Antrebus, J.P., and J. D. Moodie, J.P.
do	20	do	D. McNelly	do	do	20	Fined \$5 and costs or 14 days im- prisonment, hard labor.	Fine paid	do	.....	do
do	22	D. R. Clarke	Wm. Lawn	Non-payment of wages ..	do	22	Decision for de- fendant. Plain- tiff to pay costs.	Costs paid	do	.....	J. D. Moodie, J.P.
Sept.	23	Regina	W. H. Lewis	Liquor in possession	Sept.	23	Case dismissed on defendant show- ing liquor permit belonging to Jas. Watkins, with whom he was living.	.....	No	Calgary	W. D. Antrebus, J.P.
do	23	do	J. B. Rivet	Assault	do	23	Fined \$5 and costs, or 10 days im- prisonment, hard labor.	Fine paid	do	.....	do
do	25	A. Langley	Jno. Peale	Non-payment of wages ..	do	25	Defendant to pay costs; wages set- tled out of court.	Costs paid	do	.....	do
do	25	Regina	Wm. Hart	Drunk	do	25	Fined \$10 & costs, or 1 months im- prisonment, hard labor.	Fine paid	do	.....	do and A. Henderson, J.P.
do	27	do	F. Donohue	Liquor in possession	do	27	Fined \$200 & costs, or 3 months im- prisonment, hard labor; notice of appeal given.	Notice of appeal withdrawn; case dismissed on let- ter from Galt Bros., of Winni- peg, stating they had shipped 2 galls. of brandy to Donohue.	do	.....	W. D. Antrebus, J.P.

APPENDIX A.A.—Return of Criminal and other Cases tried in the North-West Territories—Continued.

Date of Arrest or Committal.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If tried by Jury.	Where Tried.	By Whom Tried.
1886.				1886.					
Sept. 13	R. Regina	W. Mitchell	Robbery	Commenced Sept. 29	Jury gave verdict of "Not Guilty," Sept. 30.		Yes.	Calgary	C. B. Rouleau, S.M.
do 28	do	M. McFarlane & A. Carey	Liquor in possession	Sept. 28	Case dismissed for want of evidence		No.	do	W. D. Antrobus, J.P.
do 28	do	J. Macleod and Wm. O'Brien	do	do 28	Case dismissed on permit being produced for liquor.		do	do	do
do 29	do	M. McFarlane & A. Carey	Selling liquor	do '29	Case dismissed for want of evidence		do	do	J. D. Moodie, J.P.
Oct. 4	do	Jno. Ferguson	Larceny	Oct. 4	Acquitted		do	do	W. M. Herchmer, J.P.
do 5	do	T. McIatee	Liquor in possession	do 5	Fined \$50 & costs, or 1 months imprisonment, hard labor.	Fine paid	do	do	W. D. Antrobus, J.P.
do 5	do	T. McClelland... Wm. Hurley and Geo. Hurley	Drunk ..	do 7	Case dismissed		do	do	do
do 7	T. McClelland...	Geo. Hurley	Pointing a revolver	do 7	do do prosecute to pay costs of court.		do	do	A. Henderson, J.P.
do 7	W. McDonald....	A. McNeil	Non-payment of wages...	do 7	Defendant to pay \$47.50 and costs at 3 p.m. of 8th; if not paid to be levied by distress; if not sufficient distress, 21 days imprisonment, hard labor; notice of appeal given		do	do	do
Oct. 7	J. Barr	A. McNeil	Non-payment of wages...	Oct. 7	Defendant to pay \$68.25 and costs at 3 p.m. of 8th; if		do	do	W. D. Antrobus, J.P.

do	7	Gus. Sproule	do	.....	do	7	Defendant to pay \$67.37 and costs at 10 a.m. of 9th; if not paid to be levied by distress, if not sufficient imprisonment with hard labor. Notice of appeal given.	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.	
do	12	Jno. Murphy	J. O. M. Davies..	do	do	do	12	Settled out of court	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	12	Jas. Gilruth	do	...	do	do	12	Fined \$200 and costs or 6 months' imprisonment with hard labor.	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	18	Regina	J. H. Scott	Liquor in possession.	do	do	18	Fined \$200 and costs or 6 months' imprisonment with hard labor.	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	21	do	C. N. Campbell..	Drunk.....	do	do	25	Dismissed; was at political meeting, and all were more or less excited.	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	20	do	Jno. Little	Assault	do	do	23	Discharged	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	27	do	J. Gillen.....	Selling liquor.....	do	do	27	Fined \$200 and costs or 6 months' imprisonment with hard labor.	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	27	do	Thos. Peers	do	do	do	27	do	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	28	do	Wm. Fisk	do	do	do	28	Dismissed	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	28	do	R. Brown.....	Liquor illegally in possession.	do	do	28	Fined \$200 and costs or 6 months' imprisonment with hard labor.	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	28	do	A. Carey	Selling liquor.....	do	do	29	Case dismissed	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	28	do	G. E. White.....	do	do	do	29	do	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
do	30	Wm. McLean ...	A. Smith	Non payment of wages...	do	do	30	Defendant to pay wages, \$76.12, and costs	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.
Nov.	3	Regina	Rae Hunt	Selling liquor.	Nov.	Nov.	3	Fined \$300 and costs or 6 months' imprisonment with hard labor. Notice of appeal.	do	.....	do	.....	do	not paid to be levied by distress, if not sufficient distress, 21 days imprisonment with hard labor. Notice of appeal given.

APPENDIX 'AA'—Return of Criminal and other Cases tried in the North-West Territories—Continued.

Date of Arrest or Commital.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried	By whom Tried.
1886.				1886.					
May 3	Regina.....	Sam Percival....	Selling liquor.....	May 3	Fined \$200 and costs or 6 months' imprisonment with hard labor. Notice of appeal.	.....	No.	Calgary....	J. D. Moodie, J.P.
do 3	do	A. G. McDonald.	Creating a disturbance and using abusive language.	do	3 Fined \$25 and costs or 2 months' imprisonment with hard labor.	Fine paid.....	do	do	W. D. Antrobus and J. D. Moodie, J.P.'s.
Nov. 4	Regina	Wm. Keohan and A. Hubbard.	Liquor illegally in possession.	Nov. 4	Dismissed on permits being produced to cover.	.....	.....	do	J. D. Moodie, J.P.
do 12	do	Harry Ash.....	Vagrancy.....	do 12	Discharged .....	.....	.....	do	W. D. Antrobus, J.P., and J. D. Moodie, J.P.
do 12	do	Jas. Connelly....	do	do 12	do .....	.....	.....	do	do
do 12	do	Fred. Mills.....	do	do 12	do .....	.....	.....	do	do
do 12	do	David Hastie....	do	do 12	10 days imprisonment, hard labor.	.....	.....	do	do
do 13	W. P. Walsh	Wm. Lawa	Non-payment of wages...	do 13	Defendant to pay \$24 wages and costs on or before noon of 16th inst.	Paid into court \$24 and costs on 16th inst.	.....	do	J. D. Moodie, J.P.
do 19	Regina	W. J. Dennis....	Liquor illegally in possession.	do 19	Dismissed .....	.....	.....	do	W. D. Antrobus, J.P.
do 19	do	— Fraser	do	do 19	do	Witness for prosecution did not turn up.	.....	do	do
do 19	do	J. McNeil	Selling liquor.....	do 19	do	do .....	.....	do	do
do 19	do	G. Tozer	do	do 19	do	do .....	.....	do	do
do 25	do	A. Mullette.....	Drunk.....	do 25	\$5 and costs or 14 days imprisonment.	Fine paid.....	.....	do	J. D. Moodie, J.P.
do 26	do	J. O. M. Davies..	Liquor illegally on premises.	do 27	Fined \$200 & costs or 6 months imprisonment, hard labor.	Notice of appeal ..	.....	do	W. D. Antrobus, J.P.

[illegible]

APPENDIX AA—Return of Criminal and other Cases tried in the North-West Territories—Concluded.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If tried by Jury.	Where Tried	By whom Tried.
1886.				1886.					
Aug. 18	Regina.....	G. L. Garnett...	Robbing mail	do 19	Committed for trial	Sent Regina 23rd Aug.; tried and sentenced to 14 yrs penitentiary	do	do	do
Sept. 2	Henry J Moberly	G. W. Falster...	Insanity	Sept 2	Acquitted	Costs paid	do	do	C. F. Young..
do 15	W. V. Melise ..	Albert Trotten...	Liquor illegally in possession.	do 15	Acquitted and costs	Costs paid	do	do	do
do 26	J. O. Davis.....	L O Davis.....	do	do 25	Acquitted and costs against prosecutor.	do	do	do	Supt. Perry.
Oct. 16	Regina	Martin Oleson ...	Vagrancy	Oct. 21	Acquitted	Dismissed by Stip. Magistrate.	do	do	do
do 21	do	do	Shooting with intent	do 21	Committed for trial	Dismissed by Stip. Magistrate.	do	do	do
do 21	do	John A. Mathieson.	Feloniously killing a steer.	do 21	do	Admitted to bail; dismissed by Stip Magistrate.	do	do	do
do 22	do	Geo. A. Bentley.	Illegal possession liquor.	do 23	Fined \$300 & costs	Fine paid	do	do	do
do 22	do	Norman A. McKenzie.	do	do 23	do 50 do	Case appealed to Stip. Magistrate; appeal sustained	do	do	do
do 22	do	G. A. Cockville.	do	do 23	Acquitted	do	do	do	do
do 6	do	Douglas Peterson.	Illegal sale of liquor	do 25	Fined \$150 & costs or 4 months hard labor.	Case appealed to Stip. Magistrate	do	do	do
do 26	R. H. Pretlover.	Barrie Magee....	Stealing 1 gallon whiskey	do 27	Dismissed; costs and warning.	do	do	do	do
do 24	Regina	James Clarke....	Feloniously receiving stolen property.	do 29	Committed for trial	Admitted to bail; discharged by Stip. Magistrate.	do	do	O. F. Young, Capt. Craig and Hilliard Mitchell.
do 24	do	Robert Shore....	do	do 29	do	Confined in guard room; discharged by Stip. Magistrate	do	do	do
Nov. 10	do	Robert Buckley.	Intoxicating liquor in possession.	do 17	Fined \$200 & costs	Appealed; conviction sustained.	do	do	do
do 12	do	A. H. Clarke....	Intoxicating liquor illegally sold.	do 17	do	Fine paid	do	do	O. F. Young.

[illegible]

RETURN of Cases Tried, Macleod District, from 1st December, 1885, to 31st August, 1886.

Date of Arrest.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury.	Where Tried	By whom Tried:
1885.				1885.					
Dec. 1	Queen	Wm. Wilson	Having liquor illegally in possession.	Dec. 2	Fined \$100 and costs.	On bail .....	..	.....	Inspector Antrobus.
do 1	do	N. Lachappelle.	do	do 2	do	Not paid .....	.....	.....	do
do 6	do	R. Wedlock	do	do 7	Fined \$300 and costs or 24 mos. hard labor.	.....	.....	.....	do
do 10	do	G. Lewis	Larceny	do 15	Dismissed .....	.....	.....	.....	do
do 10	do	John Shea	Vagrancy	do 10	14 days hard labor	.....	.....	.....	Supt. Cotton and Inspector Antrobus.
do 26	do	Rider (Blood Indian.)	Horse stealing	1886.			.....	.....	Col. McLeod, S.M.
do 29	do	G. Dickensen	Selling intoxicating liquor.	Dec. 29	Fined \$100 and costs	.....	.....	.....	do
do 29	do	D. Gavin	do	do 29	Fined \$300 and costs.	.....	.....	.....	Inspector Antrobus.
do 29	do	John Dowser	do	do 29	do	Case appealed and dismissed.	.....	.....	do
do 29	do	N. St. Goodard.	do	do 30	Fined \$100 and costs.	.....	.....	.....	do
do 29	do	A. Bald	Vagrancy	do 30	Dismissed .....	.....	.....	.....	Supt. Cotton and Inspector Antrobus.
1886.				1886.					
Jan. 19	do	John McIntosh	Drunk and disorderly	Jan. 20	Fined \$10 and costs or 10 days imprisonment.	Not paid .....	.....	.....	Supt. Cotton and Supt. Neale.
do 13	do	Francis Munroe.	Drunk	do 13	7 days hard labor.	.....	.....	.....	do
Feb. 2	H. Krans	H. Taylor	Non-payment of wages.	Feb. 2	Case dismissed .....	.....	.....	.....	Supt. Cotton.
do 14	Queen	B. Bohn	Having liquor in possession.	do 16	do .....	.....	.....	.....	do
do 14	do	M. Welsh	Drunk	do 16	do .....	.....	.....	.....	Supt. Cotton and Dr. Kennedy.
do 14	do	Cyr	do	do 16	do .....	.....	.....	.....	do

do	15	do	J. M. Stone.	Giving liquor to an Indian.	do	20	Fined \$300 and 6 mos. hard labor.	do	do
do	22	do	A. Bald	Vagrancy	do	23	4 mos. hard labor.	do	do
do	22	do	G. Shephard	do	do	23	do	do	do
do	23	do	John Sandwood	Assaulting an Indian	do	23	Fined \$20 and costs or 2 months hard labor. Not paid.	Supt. Cotton.	do
do	25	A. J. Roberge	B. Dowser	Non-payment of wages	do	25	To pay claimant.	do	do
do	26	Queen	W. Wilson	Selling liquor	Mar.	2	Fined \$75 and costs	do	do
do	25	do	O. Beeson	Assault	do	1	Fined \$10 or 14 days imprisonment.	Supt. Neale.	do
do	25	do	do	Having liquor in possession.	do	1	Fined \$50 and costs or 2 months hard labor.	do	do
Mar.	4	do	P. Hays	Larceny	do	do	Dismissed	Col. McLeod.	do
do	4	do	R. Coulson	do	do	do	do	do	do
do	8	do	N. Bates	Having liquor in possession.	Mar.	10	Fined \$75 and costs	Supt. Cotton.	do
do	13	do	W. Hazlett	Selling intoxicating liquor.	do	13	Dismissed	Col. McLeod, S.M.	do
do	13	do	A. Lachappelle.	do	do	14	do	do	do
do	17	do	M. Shear	Having intoxicating liquor in possession.	April	19	Fined \$100 and costs.	Supt. Cotton.	do
14	May	1	To Niskee (Blood Indian)	Horse stealing.	May	3	Dismissed for want of evidence.	Supt. Cotton and W. Pocklington.	do
do	1	do	Oant Fly (Blood Indian.)	do	do	do	do	do	do
do	25	do	W. Bates	Giving liquor to an Indian	June	14	No evidence.	Supt. Cotton and Dr. Kennedy.	do
do	4	do	M. Happte	Horse stealing	do	14	do	do	do
do	19	do	G. Mesner	Drunk and creating disturbance.	do	19	Fined \$8 and costs	do	do
July	1	do	A. Leighton	Assault	July	1	do \$10	do	do
do	16	do	G. Meener	Drunk and disorderly	do	17	do \$20	do	do
Aug	2	do	J. W. Armstrong	Assault	Aug.	2	Case dismissed.	Supt. Cotton.	do
do	do	W. Cameron	J. McIntosh	Assault	Mar.	24	Warrant not served	Lethbridge.	do
do	do	G. F. Russell	J. Manrock	Horse stealing	do	27	Prosecutor withdrew charge.	do	do
do	do	Regina	G. Houk	Selling intoxicants	April	7	Fine paid	do	do
do	do	do	N. St. Goddard	do	do	8	\$200 and costs or 6 mos. hard labor.	do	do
do	do	do	A. J. Nutting	do	do	9	\$50 and costs or 2 mos. hard labor.	do	do
do	do	T. Maroney	J. Shea	Assault	May	7	Insufficient evidence	do	do
do	do	H. Morin	Charles Bota	do	do	10	Imprisoned	do	do
do	do	do	do	do	do	10	do	do	do
do	do	do	do	do	do	10	Fine paid.	do	do

RETURN of Cases Tried, Macleod District—Concluded.

Date of Arrest or Commitment.	Prosecutor.	Defendant.	Nature of Offence.	Date of Conviction or Acquittal.	Penalty.	Remarks.	If Tried by Jury	Where Tried	By Whom Tried.
1886.				1886.					
.....	E. Frederick.....	G. Anderson.....	Assault	May 12 .....	.....	Insuffic't evidence	.....	Lethbridge..	
.....	Regina	L. Bindle.....	Selling intoxicants	do 20	\$50 and costs or 3 mos. hard labor.	Fine paid.....	.....	do	
.....	do	J. Hay	do	do 29 .....	.....	Insuffic't evidence	.....	do	
.....	do	F. Gear	Having intoxicants in possession.	June 21 .....	.....	Released, to come up for judgment when called on, in consequence of injury received by accident when in custody.	.....	do	
.....	do	W. Little.....	Selling intoxicants to Indians.	Aug. 25 .....	.....	Acquitted .....	.....	do	Col. Macleod, S.M.
.....	do	J. Tabbot.....	Having intoxicants in possession.	do 25	\$200 and costs or 6 mos. hard labor.	Fine paid.....	.....	do	
.....	do	J. Shea.....	do	Sept. 2 .....	.....	No evidence .....	.....	do	
.....	do	V. Mallette.....	Drunk and creating disturbance.	do 6	21 days' hard labor	.....	.....	Macleod.....	J. D. Moodie, J.P.
.....	do	W. O. Likens	Setting fire to prairie.....	do 3 .....	.....	No evidence .....	.....	do	
.....	J. Bathwell.....	Dog Rib (Black Indian).	Horse stealing.....	do 8 .....	.....	Charge withdrawn	.....	do	
.....	Regina	Burton	Giving liquor to Indians.	do 15 .....	.....	No evidence .....	.....	do	
.....	do	J. Haynes	do	do 22 .....	.....	do .....	.....	do	
.....	do	A. Shellhouse.....	Embezzlement.....	.....	.....	Warrant not served	.....	do	
.....	do	J. M. Robertson..	Obstructing the Police.....	Oct. 1 .....	.....	Discharged with caution.	.....	do	
.....	do	E. Byce	Having intoxicants in possession.	do 4	\$100 and costs or 3 mos. hard labor.	Fine paid .....	.....	do	
.....	A. McBride	L. Patton	Horse stealing	do 1 .....	.....	Committed for trial	.....	.....
.....	E. Taylor	P. McCormack.....	Assault	do 4	\$10 and costs or 14 days.	Fine paid.....	.....	.....
.....	F. E. Smith	W. Belgard	Larceny	do 13 .....	.....	Committed for trial	.....	.....
.....	J. Perry	G. Anderson.....	Assault	do 11	\$20 and costs or 1 month hard labor	Fine paid.....	.....	.....
.....	Regina	J. Beebe	Drunk and disorderly	do 23	\$25 and costs or 2 mos. hard labor.	do .....	.....	.....	Supt. Steele, J.P.

do	do	Giving intoxicants to Indians.	do 22	Acquitted, infor- mant left country.	do
do	J. M. Robertson.	Drunk and disorderly	do 30	\$25 and costs or 2 mos. hard labor.	do
do	J. Cleveland.	Selling intoxicants.....	Nov. 2		
do	R. Hughes.....	Drunk and disorderly	do 19	\$25 and costs or 2 mos. hard labor.	Inspector Likely, J. P.
do	A. McGregor.....	do do	do 19	do	
do	W. Minchinton...	do do	do 19	\$30 and costs or 3 mos. hard labor.	
do	Middle Bull (South Piegan)	Bringing stolen horses into Canada.	do 19	Warrant not served	
do	Medicine O'alf (Blood).	do do	do 19	do	

APPENDIX BB.

DONALD, 29th November, 1886.

SIR,—I have the honor to forward a full return of convictions and fines imposed by me as a Commissioner of Police and Justice of the Peace for British Columbia during the months of August, September, October and November, 1886.

The principal duty performed by the detachment was at Rogers' Pass, where there were men on duty at all hours, day and night. The detachment also furnished two constables every month to escort the pay-car from Donald to Port Moody.

Nothing unusual occurred outside of events already been recorded in the copies of journals.

I have the honor to be, Sir,

Your obedient servant,

WM. PIERCY,
Inspector.

Forwarded.

W. D. ANTROBUS,
Superintendent, Commanding "E" Division.

Recapitulation of cases disposed of by Inspector Piercy, as Commissioner of Police and Justice of the Peace for British Columbia, while on duty in that Province:—

Drunk and in possession of property that was not accounted for.	1
Drunk and threatening to do bodily harm.....	1
Drunk and disorderly... ..	58
Assault.....	2
Assault and battery.....	2
Drunk and fighting	2
Vagrant.....	1
Drunk and interfering with police.....	3
Having Government property in possession.....	1
Total.....	<u>71</u>

Cases disposed of by Inspector Piercy, as Commissioner of Police and Justice of the Peace for British Columbia, while on duty in that Province.

Date of Arrest.	Prosecutor.	Defendant.	Offence.	Date of Hearing.	Penalty.	Paid or Not.	Remarks.
1886.				1886.			
Aug. 8	The Queen	Wm. Faust	Drunk, and the possession of a trust of hay he could not account for.	9 Aug.	Fined \$4, double the value, or 30 days, hard labor.	Paid.	Hay belonged to Ross & McDrumair.
do 22	do	Gustave Mustana.	Drunk and threatening to stab.	do 27	Fined \$10 or 30 days, hard labor.	do	Summons. Released 24th Aug., 1886.
do 23	do	Pat McNally	Drunk and disorderly	do 26	do 5 do	do	Summons issued 26th Aug., 1886.
do 25	do	John Riley	do	do 26	do 1 do	do	Summons.
do 27	A. Martin	David Conley	Assault	do 27	do 2 do	do	Summons.
do 27	The Queen	Geo. Gluson	Assaulting provincial police.	do 28	do 20 or 1 mo., hard labor	do	do
do 27	do	Wm. Maquire	Drunk and disorderly	Sept. 1	do 1 or 14 days, hard labor.	do	do
do 30	do	Oliver La Blanc.	do	do 1	do 1 do	do	do
do 31	do	Thos. Beemer.	do	do 1	do 1 do	do	do
Sept. 1	do	Henry Little	do	do 2	do 1 do	do	do
do 4	do	John Sullivan	Assault and battery on one Jessie Holmes.	do 4	do 10 or 2 mos., hard labor	do	Warrant.
do 4	do	John Burnes	do	do 4	do 13 do	do	do
do 8	do	Jas. Madden	Drunk and disorderly	do 9	do 2 do	do	do
do 11	do	Pat Dwyer	do	do 13	do 1 or 14 days, hard labor.	do	Summons.
do 13	do	Frank Kelly	Drunk and fighting	do 13	do 10 or 21 days, hard labor.	do	do
do 13	do	Geo. Gleeson	do	do 13	do 10 do	do	do
do 17	do	Jas. Madden	Drunk and disorderly	do 18	do 10 or 1 mo., hard labor	do	Second offence.
do 19	do	Hugh McFadden	do	do 20	do 2 or 7 days, hard labor	do	do
do 20	do	Robt. Ramsey	do	do 21	do 1 or 14 days, hard labor.	do	do
do 20	do	Wm. Spittle	do	do 21	do 1 do	do	do
do 20	do	Geo. Matheson	do	do 21	do 1 do	do	do
do 30	do	Thos. Connelly	do	Oct. 1	do 2 do	do	do
do 28	do	Wm. Burnett	do	do 1	do 2 do	do	do
do 28	do	Wm. Parnes	do	do 1	do 1 do	do	do
do 1	do	And. Glasgow	do	do 4	do 1 or 10 days, hard labor.	do	do
do 1	do	Arthur Moysen	do	do	do 1 do	do	do
do 1	do	Chas. Browne	do	do	do 1 do	do	do
do 2	do	A. Parker	do	do 4	do 1 do	do	do

Cases disposed of by Inspector Piercy as Commissioner of Police, &c., British Columbia—Continued.

Date of Arrest.	Prosecutor.	Defendant.	Offence.	Date of Hearing	Penalty.	Paid or Not.	Remarks.
1886.				1886.			
Oct. 2	The Queen.	Ed. Johnstone	Drunk and disorderly	Oct. 4	Fined \$1 or 10 days, hard labor...	Paid.	
do 2	do	Jesse Holmes	do	do 4	do 1	do	
do 2	do	John Wallace	do	do 4	do 1	do	
do 3	do	Peter Lester	do	do 4	do 1	do	
do 3	do	John Gormely	do	do 4	do 1	do	
do 3	do	Ed. Jordan	do	do 4	do 1	do	
do 4	do	Peter Johnstone	do	do 5	do 2	do	
do 6	do	Geo. Field	Vagrant	do 5	14 days, hard labor	do	
do 13	do	Jas. Lauzon	Drunk, and obstructing police.	do 14	Fined \$5 or 30 days, hard labor	do	
do 17	do	Chas. Seymour	Drunk and disorderly	do 18	do 1	do	
do 18	do	Richard Marshall	Having two police revolvers in possession	do 18	do 64 or 2 months, hard labor	do	Double the value of each revolver.
do 20	do	Thos. Brennan	Drunk and disorderly	do 21	do 2 or 10 days, hard labor	do	
do 20	do	Alex. Morgan	do	do 21	do 1	do	
do 20	do	F. McNally	do	do 21	do 1	do	
do 20	do	Ed. Morgan	do	do 21	do 1	do	
do 29	do	Jas. Jersey	do	do 30	do 1	do	
do 29	do	Dan. Miller	do	do 30	do 1	do	
do 29	do	Alex. Skerd	do	do 30	do 1	do	
do 29	do	Jas. Attonner	do	do 30	do 1	do	
do 29	do	John Middleton	do	do 30	do 1	do	
do 29	do	Jas. Hawkes	do	do 30	do 1	do	
do 29	do	John McHugh	do	do 30	do 1	do	
do 29	do	Wm. Irvine	do	do 30	do 1	do	
do 29	do	George Robinson	do	do 30	do 1	do	
do 31	do	Wm. McPhee	do	Nov. 1	do 1	do	
do 31	do	Thos. Fortune	do	do 1	do 1	do	
Nov. 7	do	George Tate	Interfering with police in execution of their duty.	do 8	do 1	do	
do 10	do	Fred. Frost	do	do 11	do 5	do	
do 13	do	Hugh McIntyre	Drunk and disorderly	do 15	do 1	do	
do 14	do	Pat. Sullivan	do	do 15	do 1	do	
do 14	do	Geo. Wright	do	do 15	do 1	do	
do 15	do	Wm. Burnett	do	do 17	do 5	do	Second offence.

do 17	do	Geo. Pollick	do	.....	do 18	do	1	do	do	do
do 17	do	Wm. Gaummett.....	do	.....	do 18	do	1	do	do	do
do 31	do	Wm. McPhee	do	.....	do 1	do	1	do	do	do
do 31	do	Thos. Fortune	do	.....	do 1	do	1	do	do	do
do 7	do	Geo. Tate	do	.....	do 8	do	1	do	do	do
do 10	do	F. Frost.....	Drunk and interfering with police in execution of their duty.	.....	do 11	do	5 or 30 days, hard labor ...	do	do	do
do 13	do	Hugh McIntyre	Drunk and disorderly.....	.....	do 15	do	1 or 10 days, hard labor ...	do	do	do
do 14	do	Pat. Sullivan.....	do	.....	do 15	do	1	do	do	do
do 14	do	Geo. Wright.....	do	.....	do 15	do	1	do	do	do
do 15	do	Wm. Burnett.....	do	.....	do 17	do	5 or 30 days, hard labor ...	do	do	Second offence.
do 17	do	Geo. Pollick	do	.....	do 18	do	1 or 10 days, hard labor ...	do	do	do
do 17	do	Wm. Gaummett ...	do	.....	do 18	do	1	do	do	do

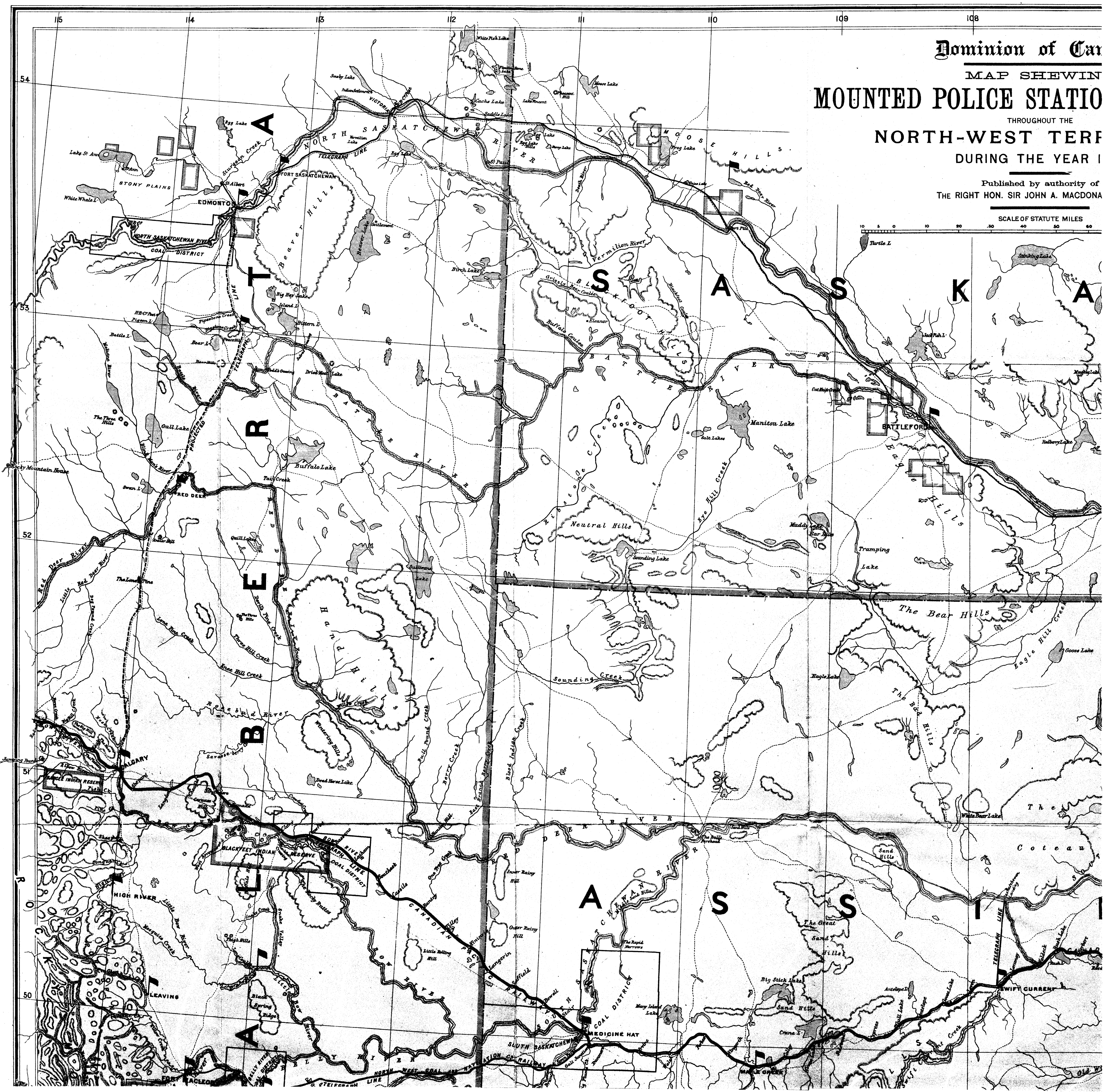
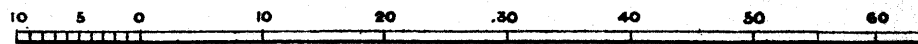
Certified correct,

WM. PIERCY,
Inspector, Commanding Detachment.

Dominion of Canada
MAP SHEWIN
MOUNTED POLICE STATION
THROUGHOUT THE
NORTH-WEST TERRITORY
DURING THE YEAR 1

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SCALE OF STATUTE MILES



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PROVINCES,
1886.

LD, G.C.B.

REFERENCES:

- Mounted Police Stations
- Do Patrols (in white lines)
- Telegraph Lines in operation
- Do projected
- Indian Reserves
- Trails

